

**Curtin Business School**

**School of Information Systems**

**Understanding The Relationship Between Information Systems  
Investment And Organisational Performance: Developing and  
Testing A Conceptual Model In The Australian Financial Services  
Sector**

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**This Thesis is presented for the Degree of**

**Doctor of Philosophy (Information Systems)**

**of**

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## **Declaration**

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgment has been made.

Signature:



Date: 21 July 2004

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# Table of Contents

<b><u>LIST OF TABLES.....</u></b>	<b><u>VI</u></b>
<b><u>LIST OF FIGURES.....</u></b>	<b><u>IX</u></b>
<b><u>ABSTRACT.....</u></b>	<b><u>XI</u></b>
<b><u>1.0 EXECUTIVE SUMMARY.....</u></b>	<b><u>13</u></b>
1.1 INTRODUCTION .....	13
1.2 RESEARCH OVERVIEW.....	13
1.3 BACKGROUND .....	13
1.4 OBJECTIVES .....	15
1.4.1 SIGNIFICANCE.....	16
1.5 RESEARCH MODEL.....	17
1.6 RESEARCH QUESTIONS.....	18
1.7 PHASES OF RESEARCH PROGRAM .....	18
1.8 LAYOUT OF THESIS .....	19
1.8.1 CHAPTER 1 – EXECUTIVE SUMMARY.....	19
1.8.2 CHAPTER 2 – LITERATURE REVIEW .....	20
1.8.3 CHAPTER 3 – A META-ANALYSIS OF EARLIER RESEARCH .....	20
1.8.4 CHAPTER 4 – CONCEPTUAL MODEL .....	21
1.8.5 CHAPTER 5 – RESEARCH METHODS IN IS RESEARCH .....	21
1.8.6 CHAPTER 6 – RESEARCH DESIGN .....	22
1.8.7 CHAPTER 7 – COMMERCIAL/RETAIL BANK CASES .....	22
1.8.8 CHAPTER 8 – CREDIT UNION CASES .....	23
1.8.9 CHAPTER 9 – PRELIMINARY TESTING OF CONCEPTUAL MODEL VIA SURVEY .....	24
1.8.10 CHAPTER 10 – DISCUSSION OF RESEARCH FINDINGS.....	25
1.8.11 CHAPTER 11 – CONTRIBUTION, CONCLUSION AND RECOMMENDATIONS .....	25
1.8.12 REFERENCES AND APPENDICES.....	26
<b><u>2.0 LITERATURE REVIEW.....</u></b>	<b><u>27</u></b>
2.1 INTRODUCTION .....	27
2.2 BACKGROUND .....	28
2.3 DEFINITIONS .....	29
2.3.1 INFORMATION TECHNOLOGY (IT).....	31
2.3.2 INFORMATION SYSTEM (IS).....	32
2.3.3 IS AS AN INVESTMENT .....	32
2.3.4 ORGANISATIONAL PERFORMANCE.....	35
2.3.5 IS INVESTMENT THRESHOLD.....	37
2.3.6 STRATEGIC INFORMATION SYSTEMS PLANNING .....	38
2.3.7 MANAGERIAL EFFECTIVENESS .....	39
2.3.8 PRODUCTIVITY PARADOX REVISITED .....	40
2.4 FINANCIAL SERVICES SECTOR IN AUSTRALIA.....	43
2.4.1 BACKGROUND .....	43

2.4.2	COMPOSITION .....	44
2.4.3	A PORTERIAN ANALYSIS OF THE FSS.....	46
2.4.4	REGULATORY FRAMEWORK .....	52
2.4.5	COMMERCIAL/RETAIL BANKING INDUSTRY .....	54
2.4.6	CREDIT UNION INDUSTRY .....	56
2.4.7	PROBLEMS AND CHALLENGES .....	58
<b>2.5</b>	<b>IS IN THE FSS.....</b>	<b>59</b>
2.5.1	INVESTMENT IN IS .....	59
2.5.2	IMPORTANCE AND CRITICALITY .....	61
<b>2.6</b>	<b>CHAPTER SUMMARY .....</b>	<b>62</b>
<b>3.0</b>	<b><u>A LITERATURE META-ANALYSIS.....</u></b>	<b><u>64</u></b>
<b>3.1</b>	<b>INTRODUCTION .....</b>	<b>64</b>
<b>3.2</b>	<b>SCOPE.....</b>	<b>65</b>
<b>3.3</b>	<b>OBJECTIVES .....</b>	<b>65</b>
<b>3.4</b>	<b>METHOD.....</b>	<b>66</b>
<b>3.5</b>	<b>META-ANALYSIS INSTRUMENT .....</b>	<b>67</b>
<b>3.6</b>	<b>RESULTS.....</b>	<b>69</b>
3.6.1	JOURNAL DEMOGRAPHICS.....	69
3.6.2	BASE THEORIES AND DISCIPLINES .....	72
3.6.3	METHOD RELATED ISSUES .....	76
3.6.4	IS INVESTMENT AND ORGANISATIONAL PERFORMANCE RELATIONSHIP.....	78
3.6.5	VARIABLES.....	78
3.6.6	THEMES IN IS INVESTMENT LITERATURE.....	82
<b>3.7</b>	<b>IMPLICATIONS.....</b>	<b>90</b>
<b>3.8</b>	<b>CHAPTER SUMMARY .....</b>	<b>91</b>
<b>4.0</b>	<b><u>CONCEPTUAL MODEL.....</u></b>	<b><u>92</u></b>
<b>4.1</b>	<b>INTRODUCTION .....</b>	<b>92</b>
<b>4.2</b>	<b>THEORETICAL FOUNDATIONS .....</b>	<b>93</b>
4.2.1	A RESOURCE BASED VIEW OF IS INVESTMENTS .....	93
4.2.2	STAKEHOLDER THEORY OF THE ORGANISATION .....	95
4.2.3	GENERAL SYSTEMS THEORY .....	97
4.2.4	PRÉCIS.....	97
<b>4.3</b>	<b>A REVIEW OF EARLIER MODELS .....</b>	<b>98</b>
4.3.1	LUCAS MODEL.....	99
4.3.2	TRICE AND TREACY MODEL .....	100
4.3.3	WEILL MODEL.....	101
4.3.4	MCKEEN AND SMITH MODEL .....	103
4.3.5	MARKUS AND SOH MODEL.....	104
4.3.6	SUMMARY OF WEAKNESSES IN EARLIER MODELS.....	105
<b>4.4</b>	<b>THE CONCEPTUAL MODEL.....</b>	<b>105</b>
4.4.1	LEVEL OF INVESTMENT – IT PORTFOLIO .....	107
4.4.2	ORGANISATIONAL PERFORMANCE.....	111
4.4.3	STRATEGIC PLANNING FOR INFORMATION SYSTEMS (SISP) .....	112
4.4.4	MANAGERIAL EFFECTIVENESS .....	117
<b>4.5</b>	<b>THE IMPORTANCE OF CONTEXT.....</b>	<b>120</b>

4.5.1	EXTERNAL FACTORS.....	123
4.5.2	INTERNAL FACTORS.....	124
<b>4.6</b>	<b>SIGNIFICANCE AND IMPORTANCE.....</b>	<b>125</b>
4.6.1	RESEARCH.....	125
4.6.2	CONCEPTUAL MODEL.....	126
<b>4.7</b>	<b>CHAPTER SUMMARY.....</b>	<b>127</b>
<b>5.0</b>	<b><u>RESEARCH METHODS.....</u></b>	<b><u>129</u></b>
<b>5.1</b>	<b>INTRODUCTION.....</b>	<b>129</b>
<b>5.2</b>	<b>FOUNDATIONS OF IS RESEARCH.....</b>	<b>130</b>
<b>5.3</b>	<b>THE POSITIVIST/INTERPRETIVIST DICHOTOMY.....</b>	<b>130</b>
5.3.1	POSITIVISM.....	133
5.3.2	INTERPRETIVISM.....	135
5.3.3	PLURALISM IN IS RESEARCH.....	136
<b>5.4</b>	<b>RESEARCH METHODS IN IS.....</b>	<b>139</b>
5.4.1	MEASUREMENT.....	140
<b>5.5</b>	<b>SELECTION OF RESEARCH METHODS.....</b>	<b>141</b>
5.5.1	SUITABILITY OF CASE RESEARCH METHODS.....	143
5.5.2	SUITABILITY OF SURVEY RESEARCH METHOD.....	147
<b>5.6</b>	<b>CHAPTER SUMMARY.....</b>	<b>151</b>
<b>6.0</b>	<b><u>RESEARCH DESIGN.....</u></b>	<b><u>153</u></b>
<b>6.1</b>	<b>INTRODUCTION.....</b>	<b>153</b>
<b>6.2</b>	<b>COMPONENTS OF A PRACTICAL RESEARCH DESIGN.....</b>	<b>154</b>
6.2.1	RESEARCH QUESTIONS REVISITED.....	154
6.2.2	PROPOSITIONS.....	155
6.2.3	UNITS OF ANALYSIS.....	160
6.2.4	LOGIC LINKING DATA AND PROPOSITIONS.....	163
6.2.5	CRITERIA FOR INTERPRETING FINDINGS.....	166
<b>6.3</b>	<b>RESEARCH STRATEGY.....</b>	<b>167</b>
6.3.1	ORIGINAL RESEARCH FRAMEWORK.....	168
6.3.2	ACTUAL RESEARCH STRATEGY.....	170
6.3.3	PHASE 1: MODEL DEFINITION.....	172
6.3.4	PHASE 2: MODEL DEVELOPMENT AND TESTING.....	176
6.3.5	PHASE 3: MODEL REFINEMENT.....	187
<b>6.4</b>	<b>RESEARCH INSTRUMENTS.....</b>	<b>188</b>
6.4.1	DEVELOPING AND TESTING RESEARCH INSTRUMENTS.....	189
6.4.2	CASE RESEARCH INSTRUMENT.....	190
6.4.3	SURVEY INSTRUMENT.....	194
<b>6.5</b>	<b>RELIABILITY AND VALIDITY.....</b>	<b>196</b>
6.5.1	RELIABILITY.....	197
6.5.2	MEASUREMENT VALIDITY.....	198
<b>6.6</b>	<b>CHAPTER SUMMARY.....</b>	<b>198</b>
<b>7.0</b>	<b><u>COMMERCIAL/RETAIL BANK CASES.....</u></b>	<b><u>201</u></b>

<b>7.1</b>	<b>INTRODUCTION .....</b>	<b>201</b>
<b>7.2</b>	<b>PILOT CASE – PC1 .....</b>	<b>203</b>
7.2.1	CASE DESCRIPTION.....	203
7.2.2	CASE ANALYSIS.....	206
7.2.3	EXTENDED CONCEPTUAL MODEL FOR PC1 .....	228
<b>7.3</b>	<b>COMMERCIAL/RETAIL BANK CASE 1 .....</b>	<b>230</b>
7.3.1	CASE DESCRIPTION.....	230
7.3.2	CASE ANALYSIS.....	233
7.3.3	EXTENDED CONCEPTUAL MODEL FOR CRB1.....	257
<b>7.4</b>	<b>COMMERCIAL/RETAIL BANK CASE 2.....</b>	<b>262</b>
7.4.1	CASE DESCRIPTION.....	262
7.4.2	CASE ANALYSIS.....	264
7.4.3	EXTENDED CONCEPTUAL MODEL FOR CRB2.....	288
<b>7.5</b>	<b>COMPOSITE EXTENDED MODEL FOR COMMERCIAL/RETAIL BANKS .....</b>	<b>290</b>
<b>7.6</b>	<b>CHAPTER SUMMARY .....</b>	<b>299</b>
<b>8.0</b>	<b><u>CREDIT UNION CASES.....</u></b>	<b><u>301</u></b>
<b>8.1</b>	<b>INTRODUCTION .....</b>	<b>301</b>
<b>8.2</b>	<b>CREDIT UNION CASE 1 .....</b>	<b>303</b>
8.2.1	CASE DESCRIPTION.....	303
8.2.2	DATA SOURCES AND PARTICIPANTS .....	304
8.2.3	CASE ANALYSIS.....	306
8.2.4	EXTENDED CONCEPTUAL MODEL FOR CUC1.....	324
<b>8.3</b>	<b>CREDIT UNION CASE 2 .....</b>	<b>327</b>
8.3.1	CASE DESCRIPTION.....	327
8.3.2	CASE ANALYSIS.....	330
8.3.3	EXTENDED CONCEPTUAL MODEL FOR CUC2.....	353
<b>8.4</b>	<b>CREDIT UNION CASE 3 .....</b>	<b>356</b>
8.4.1	CASE DESCRIPTION.....	356
8.4.2	CASE ANALYSIS.....	359
8.4.3	EXTENDED CONCEPTUAL MODEL FOR CUC3.....	380
<b>8.5</b>	<b>COMPOSITE EXTENDED MODEL FOR CREDIT UNION CASES.....</b>	<b>383</b>
<b>8.6</b>	<b>CHAPTER SUMMARY .....</b>	<b>388</b>
<b>9.0</b>	<b><u>PRELIMINARY TESTING OF CONCEPTUAL MODEL .....</u></b>	<b><u>390</u></b>
<b>9.1</b>	<b>INTRODUCTION .....</b>	<b>390</b>
<b>9.2</b>	<b>OBJECTIVES .....</b>	<b>391</b>
<b>9.3</b>	<b>INSTRUMENT .....</b>	<b>391</b>
<b>9.4</b>	<b>METHOD.....</b>	<b>392</b>
<b>9.5</b>	<b>DATA ANALYSIS .....</b>	<b>393</b>
9.5.1	DEMOGRAPHIC DATA.....	393
9.5.2	ORGANISATIONAL DATA .....	395
9.5.3	LEVEL OF IS INVESTMENT (IT PORTFOLIO).....	395
9.5.4	ORGANISATIONAL PERFORMANCE .....	397
9.5.5	INTERMEDIARY VARIABLES .....	400
9.5.6	MANAGERIAL EFFECTIVENESS .....	402
9.5.7	CONSIDERATIONS FOR SISP .....	405

9.5.8	CONTEXT (ENVIRONMENT) .....	406
9.6	REFINEMENT OF CONCEPTUAL MODELS.....	409
9.7	CONCLUSIONS .....	409
9.8	SURVEY LIMITATIONS .....	410
9.9	CHAPTER SUMMARY .....	411
<b>10.0</b>	<b><u>DISCUSSION OF RESEARCH FINDINGS .....</u></b>	<b>412</b>
10.1	INTRODUCTION.....	412
10.2	RESEARCH PRÉCIS .....	413
10.3	COMPARISON OF COMPOSITE EXTENDED MODELS.....	415
10.4	INTERMEDIARY VARIABLES .....	419
10.4.1	STAFF .....	421
10.4.2	PRODUCT DELIVERY .....	422
10.4.3	OPERATIONAL EFFICIENCY .....	424
10.4.4	CUSTOMER SERVICE QUALITY .....	426
10.5	IS INVESTMENT THRESHOLD .....	428
10.6	ADDRESSING THE RESEARCH QUESTIONS AND PROPOSITIONS .....	429
10.6.1	PROPOSITION 1 – IS INVESTMENT .....	430
10.6.2	PROPOSITION 2 – ORGANISATIONAL PERFORMANCE.....	431
10.6.3	PROPOSITION 3 – MANAGERIAL EFFECTIVENESS.....	433
10.6.4	PROPOSITION 4 – CONSIDERATIONS FOR SISP.....	435
10.6.5	PROPOSITION 5 – ORGANISATIONAL CONTEXT .....	436
10.7	DEDUCTIONS .....	437
10.8	CHAPTER SUMMARY .....	438
<b>11.0</b>	<b><u>CONTRIBUTION, CONCLUSIONS AND RECOMMENDATIONS..</u></b>	<b>440</b>
11.1	INTRODUCTION.....	440
11.2	CONTRIBUTION OF THIS RESEARCH .....	440
11.2.1	CONCEPTUAL.....	441
11.2.2	PRACTICAL .....	444
11.3	LIMITATIONS OF THIS RESEARCH .....	446
11.4	CONCLUSIONS .....	448
11.5	RECOMMENDATIONS FOR FUTURE RESEARCH.....	450
<b>12.0</b>	<b><u>REFERENCES .....</u></b>	<b>451</b>
12.1	REFERENCES .....	451
12.2	PUBLICATIONS ARISING FROM THIS RESEARCH .....	479
12.3	FORTHCOMING PUBLICATIONS .....	480
12.4	BIBLIOGRAPHY.....	480
<b>13.0</b>	<b><u>APPENDICES.....</u></b>	<b>493</b>



---

# *List of Tables*

Table 2.1: Australian Regulatory Framework pre-1997.....	53
Table 2.2: Regulatory framework after the Wallis enquiry.....	54
Table 3.1: Classification of research methods in IS research.....	68
Table 3.2: Summary of article counts per Journal.....	70
Table 3.3: Sample disciplines that have contributed to IS investment and Organisational performance research (adapted (Lucas 1993)).....	73
Table 3.4: Base theories and disciplines in business value of IS research identified in the meta-analysis.....	74
Table 3.5: Design issues in business value of IS research.....	76
Table 3.6: Frequency of independent variables.....	79
Table 3.7: Most frequently cited dependent variables.....	80
Table 3.8: Frequency of technology related dependent variables.....	80
Table 5.1: Summary and comparison of underlying philosophies in IS research (adapted: Galliers (1990)).....	131
Table 5.2: Comparison of strengths and weakness of three commonly used research methods (Source: Gable (1994)).....	138
Table 5.3: Summary of qualitative and quantitative measurement.....	141
Table 5.4: Criterion for selection of research methods (adapted from (Yin 1994))	142
Table 5.5: Comparison of qualitative research strategies (Source: (Cavaye 1996))	144
Table 5.6: Types of surveys and their features (Neuman 2000).....	148
Table 6.1: Units of Analysis and representative studies.....	160
Table 6.2: Dominant modes of analysis (Adapted (Yin 1994)).....	165
Table 6.3: Lesser modes of analysis (Source: Yin (1994)).....	166
Table 6.4: Research strategy for conducting Case research (adapted: (Eisenhardt 1989)).....	169
Table 6.5: Cases selected for IS investment and organisational performance research in the Australian FSS.....	174
Table 6.6: Data sources in Case research.....	182
Table 6.7: Secondary data sources.....	184
Table 6.8: Case study protocol outline.....	191
Table 6.9: Structure and content of Survey research instrument.....	195
Table 6.10: Ensuring validity and reliability in the research design and instruments (Adapted Neuman 2000)).....	197
Table 7.1 Data sources and participants in PC1.....	204
Table 7.2: Illustrative products and services offered by PC1.....	206
Table 7.3: Definitions of IS and IT in PC1.....	217
Table 7.4: Internal and external KPIs used in PC1.....	220
Table 7.5: Responses regarding questions relating to the considerations for SISP in PC1.....	224
Table 7.6: Presence and impact of Managerial effectiveness factors.....	225
Table 7.7: Ratings of user satisfaction in PC1.....	226
Table 7.8: Data sources and participants from CRB1 case.....	231
Table 7.9: Illustrative products and services offered by CRB1.....	232
Table 7.10: Responses regarding the use and suitability of financial methods for managing IS activities in CRB1.....	239

Table 7.11: Participant ratings of relative importance of IT portfolio components.	243
Table 7.12: Emergent set of intermediary variables and their areas of impact in CRB1.....	245
Table 7.13: Summary of internal and external KPIs as used in PC1 .....	246
Table 7.14: Status of factors that make up the considerations for SISP in CRB1 ...	250
Table 7.15: Presence and impact of the factors that constitute Managerial effectiveness.....	252
Table 7.16: Responses regarding the impact of politics on IS investment decision making in CRB1 .....	255
Table 7.17: Data sources and participants from CRB2 case.....	263
Table 7.18: Illustrative products and services offered by CRB2 .....	264
Table 7.19: Participant ratings of relative importance of IT portfolio components.	274
Table 7.20: Emergent set of intermediary variables and their areas of impact in CRB2.....	276
Table 7.21: Internal and external KPIs in CRB2 .....	279
Table 7.22: Status of considerations for SISP in CRB2 .....	282
Table 7.23: Presence and impact of Managerial effectiveness factors.....	283
Table 7.24: Summary of key similarities/differences in commercial/retail bank cases .....	291
Table 7.25: Presence and impact of Managerial effectiveness factors.....	295
Table 8.1: CUC1 data sources and participants .....	304
Table 8.2: CUC1 product and services summary.....	305
Table 8.3: CUC1 IS budget ratios (percentage of overall expenditure) .....	313
Table 8.4: IS management ratios for CUC1.....	313
Table 8.5: Rating of IT portfolio components .....	315
Table 8.6: Impact of IT portfolio as perceived by participants.....	317
Table 8.7: Summary of impact of IT portfolio in CUC1 .....	317
Table 8.8: Products and services affected by the intermediary variables.....	318
Table 8.9: Key Performance Indicators .....	319
Table 8.10: Status of considerations for SISP in CUC1 .....	321
Table 8.11: Impact of Managerial effectiveness variables in CUC1 .....	322
Table 8.12: CUC2 data sources and participants .....	328
Table 8.13: Some of the products and services offered by CUC2 .....	329
Table 8.14: CUC2 IS budget ratios (percentage of overall expenditure) .....	336
Table 8.15: IS management ratios in CUC2 .....	337
Table 8.16: Participant ratings of relative importance of IT portfolio components	342
Table 8.17: Emergent set of intermediary variables and their areas of impact in CUC2 .....	345
Table 8.18: Key Performance Indicators in CUC2 .....	346
Table 8.19: Status of considerations for SISP in CUC2.....	349
Table 8.20: Impact of Managerial effectiveness variables on IS investment and Organisational performance relationship in CUC2 .....	350
Table 8.21: Data sources and participants from CUC3 case .....	357
Table 8.22: CUC3 products and services .....	358
Table 8.23: Individual responses regarding the importance and contribution of IT portfolio components to organisational performance. ....	367
Table 8.24: Emergent set of intermediary variables and their areas of impact in CUC3 .....	369
Table 8.25: Key Performance Indicators in CUC3 .....	370
Table 8.26: Considerations for SISP in CUC3 .....	374

---

Table 8.27: Impact of Managerial effectiveness variables on IS investment and organisational performance relationship in CUC3 .....	375
Table 8.28: Summary of key similarities/differences in the credit union cases .....	383
Table 8.29: Presence and impact of Managerial effectiveness factors.....	386
Table 9.1: Composition of Australian FSS .....	393
Table 9.2: Comparison of IS investment thresholds across industries in FSS.....	396
Table 9.3: Internal and external KPIs for the sample.....	398
Table 9.4: Most commonly cited KPIs in commercial/ retail banks.....	399
Table 9.5: Most commonly cited KPIs in credit unions.....	400
Table 9.6: Average ratings of IS impact on Intermediary variables for the sample	400
Table 9.7: Comparison of mean ratings between industries in the sample .....	401
Table 9.8: Respondents' perspectives on organisation experience .....	404
Table 9.9: Comparison of means between commercial/retail banks and credit unions .....	406
Table 9.10: Influence and impact of Context on IS investment and organisational performance relationship.....	407
Table 9.11: Comparison of means between commercial/retail banks and credit unions regarding influence of contextual factors .....	408
Table 10.1: Comparisons of composite extended conceptual models.....	416

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# *List of Figures*

Figure 2.1: Significance and importance of FSS in Australia (Adapted Trewin (2000)).....	43
Figure 2.2: Distribution of ADIs in the Australian FSS .....	45
Figure 2.3: A Porterian analysis of the FSS in Australia.....	47
Figure 2.4: A five forces model of the Australian FSS .....	49
Figure 3.1: Article frequencies in research sample .....	71
Figure 3.2: Themes and concepts around the business value of IS.....	82
Figure 4.1: Typical Stakeholder map for a firm (Source: (Donaldson and Preston 1995)).....	96
Figure 4.2: A simple cause and effect view of the IS investment and organisational performance relationship.....	98
Figure 4.3: An early model of the IS investment and organisational performance relationship (Lucas 1975b).....	99
Figure 4.4: A revised model of IS investment and organisational performance (Lucas 1993) .....	100
Figure 4.5: An expanded view of IS investment and organisational performance (Trice and Treacy 1986).....	101
Figure 4.6: Relationship between IS investment and organisational performance (Source: Weill (1992)).....	102
Figure 4.7: Conceptual model of the relationship between IS investment and organisational performance.....	107
Figure 4.8: An Information Technology portfolio .....	108
Figure 5.1: The Positivist/Interpretivist dichotomy .....	131
Figure 5.2: Integrating positivist and interpretivist approaches (adapted (Lee 1991)) .....	137
Figure 6.1: Case research design versus Units of analysis (Adapted Yin (1994))..	162
Figure 6.2: Original research framework (Eisenhardt 1989).....	168
Figure 6.3: Actual research strategy utilised in this research .....	170
Figure 6.4: Process for carrying out Survey research (Adapted Neuman (2000))..	181
Figure 6.5: Qualitative data analysis process derived for and utilised in the research strategy .....	185
Figure 6.6: Within Case and Cross Case Analysis.....	187
Figure 7.1: PC1 organisational structure .....	209
Figure 7.2: Conceptual model for PC1 .....	228
Figure 7.3: CRB1 corporate structure .....	236
Figure 7.4: Structure of Information Systems SBU in CRB1.....	237
Figure 7.5: CRB2 organisational structure .....	267
Figure 7.6: CRB2 corporate IS structure.....	268
Figure 7.7: Composite extended conceptual model for the commercial/retail bank case.....	298
Figure 8.1: CUC1 structure.....	310
Figure 8.2: Conceptual model extension for CUC1 .....	324
Figure 8.3: CUC2 structure.....	333
Figure 8.4: Graphical representation of CUC2 IS budget ratios (percentage of overall expenditure).....	336

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Figure 8.5: CUC3 organisational structure .....	362
Figure 8.6: Extended conceptual model for CUC3 .....	380
Figure 8.7: Composite extended conceptual model for credit unions in the sample .....	387
Figure 9.1: Distribution of respondent FIs in survey sample.....	394
Figure 10.1: Intermediary variables influencing the IS investment and organisational performance relationship.....	420
Figure 10.2: Current and future product delivery channels .....	423
Figure 10.3: Typical IPO model for a FI (adapted (Zenios et al. 1999)).....	425

---

# *Abstract*

The research reported in this thesis was an exploratory study that investigated the relationship between Information Systems (IS) investment and organisational performance and which led to the successful development and testing of a combined process and variance model that sought to explain this complex relationship. The focal industry was the Australian Financial Services Sector (FSS), with samples being drawn from both the credit union industry (largest industry by size in the FSS) and the commercial/retail bank industry (largest industry by volume).

The research began with a detailed review of the literature and thus explored the concepts underlying the business value of IS in general and the relationship between IS investment and organisational performance in particular. To further enhance understanding of this literature, a meta-analysis of the business value of IS in general, and IS investment and organisational performance in particular, was undertaken as it was noted that there did not appear to have been any such formal structured meta-analyses to date. The foregoing analyses led to the proposal and development of a conceptual model of the relationship between IS investment and organisational performance that was comprised of four main components, the level of IS investment as represented by the IT portfolio, Organisational performance (both internal and external), Considerations for Strategic Information Systems Planning and Managerial effectiveness. In addition, the conceptual model explicitly considered the effect and impact of Context on the conceptual model. Further, analysis of subsequent results was strongly grounded in the literature and utilised three key theoretical foundations, General Systems Theory, The Resource Based View of IT and Stakeholder theory.

Thus, the conceptual model was developed and tested utilising a pluralist approach combining two research methods, a) Case research (model development and testing) and b) survey research (model refinement). The collection (and analysis) of data was achieved in two parts. First, given the complexity of the issues under investigation, a unique case study protocol was successfully developed and applied to a select group of Financial Institutions with the Commercial/retail Banking and Credit Union

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industries to confirm the components of the original conceptual model. Second, the resultant model(s) were tested via a survey targeted at the wider population of Authorised Deposit-taking Institutions in the Australian Financial Services Sector.

The outcomes of this research were many, however the most notable were; 1) the development and testing of the conceptual model which were deemed to contribute to the development of theory within the discipline of Information Systems, 2) the development of a unique case study protocol that was deemed to contribute to IS research in general, 3) the derivation of a set of intermediary variables (Customer service quality, Operational efficiency, Staff and Product delivery) that was found to influence the relationship between IS investment and organisational performance and therefore extended and strengthened the conceptual model, and 4) the meta-analysis that was deemed to contribute to a better understanding of the state of the art with respect to research into this complex phenomenon.

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# *1.0 Executive Summary*

## **1.1 Introduction**

This chapter presents an overview of the research. It begins by setting out the objectives and purpose of the research. This is followed by a description of the research model and its significance. Subsequent to that follows the statement of the research problems and an outline of the phases of the research program. The chapter concludes by setting out the layout of this thesis.

## **1.2 Research Overview**

The research reported in this thesis is an exploratory study that investigates the relationship between Information Systems (IS) investment and organisational performance. Thus, a conceptual model was proposed to explain this relationship. This conceptual model was developed and tested utilising a pluralist approach that combined two research methods, a) Case research (model development and testing) and b) survey research (model refinement). The focal industry was the Australian Financial Services Sector (FSS), with samples being drawn from both the credit union industry (largest industry by size in the FSS) and the commercial/retail bank industry (largest industry by volume).

## **1.3 Background**

A review of the literature has shown that there appear to have been few studies that have explicitly attempted to verify the relationship between Information Systems (IS) investment and organisational performance. These include Lucas (1975a), Lucas (1975b), Cron and Sobol (1983), Turner (1985), Bresnahan (1986), Banker and Kauffman (1988), Harris and Katz (1988), Alpar and Moshe (1990), Floyd and Wooldridge (1990), Weill (1992), and Markus and Soh (2000). As part of this research, a detailed literature review (Chapter 2) and meta-analysis (Chapter 3) were



undertaken to better understand this literature, identify areas of weakness and potential areas for future research.

A number of limitations and constraints to these early studies have made them difficult to generalise and, in some instances, analysis reveals that there have been conflicting findings (Weill and Olson 1989). In addition, there does not appear to have been any consistency with respect to the economic sectors researched. Where studies did focus on a particular economic sector, there may not have been any distinction made between different industries within the given sector thus contributing to the generalisability and comparability problems (Bresnahan 1986). These shortcomings have therefore made the generalisability and comparability of the earlier studies very problematic (Mahmood and Mann 1993).

Although the aim of these earlier studies was to investigate the business value of Information Technology (IT), it is quite clear that a lack of consistent definitions, particularly with respect to IS and IT, has plagued much of this research (Weill and Olson, 1989). It is arguable that this lack of consistent definition might be attributed in part to the very dynamic and rapidly changing nature of IS and IT (Banker and Kauffman 1988; McKeown 2001). To further complicate matters various researchers, depending on the focus of their studies have used differing measures for organisational performance. For instance, Lucas (1975b) defined a model and a set of variables to determine the relationship between the use of an accounting system and the performance of an organisation. Cron and Sobol (1983) on the other hand measured the effect of computer usage and organisational performance using generic profitability measures such as sales growth over a five year period, the pre-tax profits, return on assets, return on net worth.

Thus, the research reported in this thesis was deemed to be particularly important in that contemporary organisations, particularly Financial Institutions (FIs), continue to invest significantly in IS yet the evidence in the literature appears to suggest that there does not seem to be any significant gain/return from these investments. To elaborate, Roach (1988) considered the use of technology across various industrial sectors in the United States of America post World War II through to the 1980s and suggested that despite marked increases in technology expenditure, total productivity in terms of the US economy appeared to have slowed down and in some sectors,

such as Finance, it had fallen. This observation was particularly intriguing especially when one took into account the fact that the Financial Services Sector (FSS) was, at the time, the second largest investor in computing technology, after the Telecommunications Sector, with 25% to 30% of capital stock invested in technology which had become the primary means of production. Roach (1988) termed this phenomenon the 'Productivity Puzzle' and it later became more popularly referred to as the 'Productivity Paradox' (Brynjolfsson 1993). It is noteworthy that, even at that early stage of the development of this field of research, Roach (1988) identified measurement as being one of the primary obstacles to understanding this phenomenon.

This research therefore attempts to address the foregoing issues (and more) through the development and testing of a conceptual model designed to explain the relationship between IS investment and organisational performance.

#### **1.4 Objectives**

The objectives of the research reported in this thesis were as follows:

1. To investigate and explain the relationship between IS investment and organisational performance in the FSS.
2. To build theory by developing and testing a conceptual model of the relationship between IS investment and organisational performance in the FSS that may later be extended to other economic sectors.
3. To investigate and establish the concept of an IS investment threshold and its role in the determination and management of IS investments in the FSS.
4. To investigate and establish the impact of context on the IS investment and organisational performance relationship in the FSS.
5. To add to the extant knowledge through a meticulous analysis of the existing literature thereby identifying themes for future research.

It was anticipated that in achieving these objectives, this research would contribute significantly to the current body of knowledge by encouraging debate into the issues

around the business value of IS in general and the relationship between IS investment and organisational performance in particular within the FSS.

#### **1.4.1 Significance**

Given the objectives outlined in Section 1.4, the following were identified as the areas of significance for which this research would yield immediate benefit:

- An increased understanding of the impact of IS on organisational performance, particularly in the FSS.
- A broadening of the theoretical base as few studies of this nature have so far been conducted due in part to the complexity of conducting such research. Markus and Soh (2000) also highlighted the lack of a strong theoretical base in this area of study.
- This research was unique in that it was conducted in the Australian FSS and therefore brings new insight and knowledge into the IS investment and organisational performance relationship in this context as most studies in this area have been conducted in the United States of America.
- This research builds on existing research into IS investment and organisational performance.
- This research focuses on a single economic sector. Previous investigations have tended to be broad in their scope, covering multiple sectors and consequently, their results have been difficult to generalise from. Harris and Katz (1988) observed that it is important to measure/study organisations within a single sector in order to generate any useful data, the analysis of which can then make a more meaningful contribution to the growth of knowledge in that particular area.
- Against a background of ever-increasing investment in IS, there is a need to further investigate the impact of this investment on performance, as some studies have shown a positive relationship yet others have been inconclusive.

As shall be demonstrated later, this research also yielded many other benefits, both conceptual and practical. An expanded discussion of the significance and importance of this research (and the resultant conceptual model) is presented in Chapter 4, Section 4.6 and its contributions, both conceptual and practical in Chapter 11.

## **1.5 Research Model**

The most distinctive feature of this research was the derivation of a conceptual model that was designed to address the research problems (Chapter 4). The model is based on a review of the extant literature that suggested the existence of a relationship between IS investment and organisational performance and attempted to explain this relationship in the context of FIs within the Australian FSS. Thus, the proposed model consists of the following components:

1. The Information Technology portfolio, which depicts the level of investment in IS by a FI (Markus and Soh 1993).
2. Organisational performance, as measured by a given set of performance indicators. Prior research suggests that there are two aspects to this component, an internal and an external aspect.
3. A moderating variable termed Managerial effectiveness, based on a construct identified in the literature as Conversion effectiveness (Weill and Olson 1989; Weill 1992).
4. Key considerations for Strategic Information System Planning (SISP) as identified by Weill and Olson (1989) and Earl (1993). These considerations raise questions as to how organisations can effectively/efficiently plan for IS investment.

It can be deduced from the foregoing that the model suggests that successful IS investments will have a positive effect on a FI's performance. Further, the research also takes into account the influence of context, which as shall be demonstrated later (Chapter 7 and 8), plays an important role in this relationship.

## **1.6 Research Questions**

To achieve the objectives set out in Section 1.4, the following primary research question was put forward:

1. How are IS investments and organisational performance related in Financial Institutions?

In addition, four research secondary questions were put forward:

2. Do some components of a Financial Institution's IT portfolio contribute more to organisational performance than others and if so, how?
3. How does the role of management affect the IS investment and organisational performance relationship?
4. How does organisational performance affect IS investment levels?
5. Is there a "threshold" for the level of IS investment in Financial Institutions?

The research design (Chapter 6) was specifically devised to address these questions by targeting a number of propositions derived from the research questions (Yin 1994; Miles and Huberman 1994). Given the complexity of the research problems, and the need to both develop and test the conceptual model, two research methods were used: a) Case research (model development and testing) and b) survey (model refinement). A comprehensive case study protocol was developed that governed the conduct of the Case research segment of the research program (Yin 1994). The case study protocol incorporated procedures for executing each case study, the Case research instrument, data analysis guidelines and a schema defining the data that would be collected for each case. The survey segment utilised a mail-based survey following established guidelines for the conduct of such surveys (Neuman 2000).

## **1.7 Phases of Research Program**

To facilitate the management of this research program, the research was arranged into three phases (see Chapter 6) consisting of:

- Phase 1 – Model definition (including statement of research questions and proposal of conceptual model)
- Phase 2 – Model development and testing
- Phase 3 – Model refinement

The first phase began with the definition of the research questions and the subsequent proposal of a conceptual model. The case study protocol and research instruments were also developed during this phase.

The tasks executed in the second phase were aimed at verifying the components of the model based on data collected in the field via structured interviews, observation and document analysis. In addition, preliminary testing of the resultant model was conducted via a postal survey.

The final phase of model refinement was aimed at verifying and enfolding the resultant model with the existing literature and theory.

## **1.8 Layout of Thesis**

Having provided an outline of the research in the foregoing sections, this Executive Summary now turns to briefly describing the layout of this thesis. The following subsections briefly describe the order and content of each chapter in this thesis.

This thesis consists of 11 chapters, followed by comprehensive list of references, a list of publications arising from this research and bibliography (Chapter 12). Subsequent to this, follow appendices (Chapter 13).

### **1.8.1 Chapter 1 – Executive Summary**

The first chapter presents an overview of the research. It begins by setting out the objectives and purpose of the research and associated research problems. The chapter then outlines the significance of the research, the research methods and the research

design utilised to address the research problem. This chapter concludes by setting out the layout of this thesis.

### **1.8.2 Chapter 2 – Literature Review**

This chapter presents a review of the literature and discusses concepts underlying the business value of IS in general and the relationship between IS investment and organisational performance in particular. The chapter begins by presenting a thorough discussion of the background to the research problem, thus defining the purpose of conceptual model, and briefly explains why this research is significant. This then followed by the derivation and presentation of definitions of the main concepts – Information Systems, Information Technology, IS investment, organisational performance, SISP and Managerial effectiveness. After that, follows a brief discussion of the productivity paradox and its implications. The derivation of these definitions was deemed necessary given apparent inconsistencies in the use of these terms within the literature. The discussion then turns to describing the focal industry (the Australian FSS) in terms of its composition and regulatory framework utilising accepted analytical tools. Finally, the chapter discusses the role of IS investments in the FSS in particular and emphasises the importance and criticality of IS investments in the FSS. The chapter concludes with a brief summary.

### **1.8.3 Chapter 3 – A Meta-Analysis of Earlier Research**

This chapter presents a meta-analysis of earlier research. The meta-analysis was prompted by the need to develop a clearer understanding of the literature on the business value of IS in general and IS investment and organisational performance in particular. The meta-analysis covers a 22-year period from 1980 to 2001 and utilised the nine top ranked journals in 2001. Specifically, the meta-analysis had the following objectives:

- To explore the theoretical foundations for research into the relationship between IS investment and organisational performance

- To develop a taxonomy of earlier studies and thus provide insights into the current status of research in this area
- To identify and categorise themes around the business value of IS with a view to identifying directions for future research
- To provide a foundation for further research and debate, that may broaden the body of knowledge

The meta-analysis enabled the identification and categorisation of a number of themes in the literature and this in turn supported arguments for this research by proving earlier contentions on the apparent lack of theory, and lack of extensive and consistent research.

#### **1.8.4 Chapter 4 – Conceptual Model**

This chapter discusses the proposed conceptual model. It consists of five major sections. The first section presents the three key theoretical perspectives (Resource Based View theory of the firm, Stakeholder theory and General Systems Theory) and arguments regarding their relevance and applicability to the development and interpretation of the conceptual model. The second section reviews earlier models of the IS investment and organisational performance relationship as a prelude to the presentation and discussion of the actual conceptual model in the third section. The fourth section presents discussions on the importance and impact of context on the IS investment and organisational performance relationship. The final section discusses the significance and importance of both the research and the conceptual model and the chapter concludes with a summary of preceding discussions.

#### **1.8.5 Chapter 5 – Research Methods in IS Research**

A variety of research methods are available to the IS researcher. This chapter discusses and reviews many of these research methods and presents arguments as to the choice of research methods selected for and utilised in this project. This chapter is presented in four major sections. The first section discusses the theoretical



foundations of IS research in general. Subsequent to that follows a discussion of the Positivist/Interpretivist dichotomy that examines the philosophical merits of both perspectives and their influence on the selection of the research methods in the discipline of IS. This is followed by a much closer and more detailed look at the actual research methods available to the IS researcher. This chapter then presents the relative strengths and weaknesses of available research methods and develops the foundation for arguments for the selection of the research methods utilised based on a earlier taxonomy of research methods in IS research. The final section of this chapter presents a detailed discussion of the actual selection of research methods utilised coupled with definitive arguments as to their suitability to this research with particular emphasis being placed on the need to contribute to existing knowledge and develop theory.

### **1.8.6 Chapter 6 – Research Design**

This chapter discusses the research design in four sections. The first section discusses issues relating to the components of a sound and practical research design to demonstrate how these issues were incorporated into the research design utilised in this study. The second section details the research strategy, and demonstrates how (and when) the research instruments were applied. The third section is devoted to a thorough and detailed description of the research instruments. Since Case research was the research method adopted for the development of the conceptual model (discussed in Chapter 4), the development of a case study protocol was a critical design issue and is discussed in detail. In addition, the development of the survey instrument is also discussed in detail. The final section is devoted to a discussion of the issues relating to the reliability and validity of the research design and its associated research instruments.

### **1.8.7 Chapter 7 – Commercial/Retail Bank Cases**

This chapter presents and discusses the commercial/retail bank cases that participated in the research and in so doing achieves four objectives:

1. Demonstrates the validity, relevance and rigour of the case study protocol (and Case research instrument) as applied in each case.
2. Verifies the presence of the components of the conceptual model as originally proposed in commercial/retail banks.
3. Presents evidence from the cases and demonstrates how the results of the research were analysed to derive individual extended conceptual models for each case.
4. Derivation of a composite extended conceptual model that more accurately depicts the relationship between IS investment and organisational performance in commercial/retail banks.

The chapter consists of four major sections, one for each case report and a section containing the comparative analysis of the resultant models from each case. Each case report utilises a standard format and consists of two parts, a case description section followed by a case analysis section. Thus, data collected utilising the Case research instrument were analysed for each case resulting in the derivation of an extended conceptual model. These extended conceptual models are then compared and analysed to derive a composite extended model for the commercial/retail bank industry.

### **1.8.8 Chapter 8 – Credit Union Cases**

This chapter presents the case reports for the credit union cases that participated in the research program and thus achieves the following objectives:

1. Further demonstrates and strengthens the validity, relevance and rigour of the case study protocol (and research instrument).
2. Verifies the presence of the components of the conceptual model as originally proposed in credit unions.
3. Presents evidence from the credit union cases and demonstrates how the results of the research were analysed to derive individual extended conceptual models for each of the credit union cases.

4. Derivation of a composite extended conceptual model that more accurately depicts the relationship between IS investment and organisational performance for the credit union industry.

The chapter consists of four major sections, one for each case report and a section containing the comparative analysis of the resultant models from each case. Each case report utilises a standard format and consists of two parts, a case description section followed by a case analysis section. Thus, data collected utilising the Case research instrument were analysed for each case resulting in the derivation of an extended conceptual model. These extended conceptual models are then compared and analysed to derive a composite extended model for the credit union industry.

### **1.8.9 Chapter 9 – Preliminary Testing of Conceptual Model via Survey**

This chapter presents the results of the preliminary testing of the conceptual model designed to further verify the existence of the individual components of the conceptual model, their individual factors and thus facilitate in the refinement of the conceptual model.

As outlined in the Research Design (Chapter 6), this research utilised both Case research and survey methods to develop, test and refine the conceptual model. This chapter therefore endeavours to achieve three key objectives of: 1) Reporting on the preliminary test results for the conceptual model, 2) Demonstrating how these results support the findings in Chapters 7 and 8 and hence assisting in refining the conceptual model and 3) Demonstrating the conceptual model's generalisability and suitability by extending the research beyond the case sample.

Briefly, Chapter 9 begins by outlining the objectives of the preliminary testing followed by a discussion of the survey instrument and method. Subsequent to that follows a presentation of the data and its analysis. The conclusions drawn from the preliminary testing are then presented and are accompanied by a brief discussion of the limitations of the preliminary testing. The chapter concludes with a brief summary.

### **1.8.10 Chapter 10 – Discussion of Research Findings**

This chapter presents a discussion of the research findings from both model development/testing and refinement activities with the specific aim of demonstrating how the research questions were addressed by applying the base theories and the literature through a structured research design. To achieve this, the discussion covers the following areas:

- Comparisons of the composite extended conceptual models
- Discussion of the emergent set of intermediary variables
- Discussion of the implications of the concept of an IS investment threshold
- Discussion of the relevance of context

The chapter begins by providing a short précis of the research that reviews the cases involved and their key features. This is then followed by a comparative analysis of the composite extended models derived from the credit union and commercial/retail bank industries. Subsequent to that, follows a detailed explanation of the emergent set of intermediary variables with each emergent variable being individually analysed. After that follows a discussion of the concept and implications of an IS investment threshold to demonstrate the utility of this concept in determining the level of investment as represented by the IT portfolio within the context of research findings. Finally, the chapter concludes by revisiting the research questions (and propositions) to further affirm the conceptual model's ability to answer these important questions and thus explain the IS investment and organisational performance relationship.

### **1.8.11 Chapter 11 – Contribution, Conclusion and Recommendations**

This final chapter sets out the contributions, conclusions and recommendations arising from this research. It begins by outlining and reviewing the significance of this research in terms of both its conceptual and practical contributions to the existing

body of knowledge. Subsequent to this are the conclusions drawn from this research and the chapter concludes with recommendations for future research.

### **1.8.12 References and Appendices**

The last two sections of this thesis contain the references, bibliography and appendices. There are four appendices as follows:

1. Appendix 1– Information relating to the Meta-analysis research instrument and statistical tables
  2. Appendix 2 – Information relating to the research design and includes the Gantt chart for the research program, the case study protocol and research instrument.
  3. Appendix 3 – Survey research instrument and statistical tables
  4. Appendix 4 – Sample interview data (Given the large volume of data collected only two interview transcripts are included as samples of the data collected).
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## 2.0 Literature Review

### 2.1 Introduction

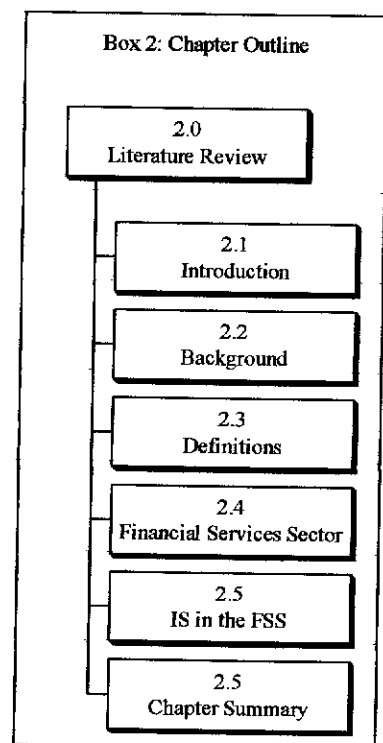
This chapter presents a review of the literature on, and discusses concepts underlying, the business value of IS in general and the relationship between IS investment and organisational performance in particular (as shown in Box 2).

Section 2.2 presents a thorough discussion of the background to the research problem, thus defining the purpose of conceptual model, and briefly explains why this research is significant.

Due to the apparent lack of consistent definitions in the literature, definitions of the main concepts have been derived and their relevance is demonstrated in subsequent discussions. Hence, Section 2.3 presents definitions of the main concepts – Information Systems, Information Technology, IS investment, organisational performance, SISP and Managerial effectiveness. These definitions include discussions on capital formation and the validity of viewing IS expenditures, particularly those of a capital nature, as investments. The concept of an IS investment threshold, its origins, importance and significance, is then presented followed by a brief introduction of the concepts of SISP and Managerial effectiveness. After that, follows a brief discussion of the productivity paradox and its implications.

The discussion then turns to describing the focal industry in terms of its composition and regulatory framework (Section 2.4). In addition, contextual issues that may impact FIs are also identified.

Section 2.5 discusses the role of IS investments in the FSS. In particular, this section focuses on the importance and criticality of IS investments in the FSS. The chapter



concludes with a summary of the literature review, focussing primarily on the significance of the relationship between IS investment and organisational performance.

## **2.2 Background**

The problem of understanding the business value of Information Systems is one that persists and continues to present a major challenge to senior management in general and IS professionals in particular. As Mahmood and Mann (1993, p98) observed:

*“Senior managers responsible for determining the level of IT expenditure are in a quandary. They perceive that appropriate IT investment may significantly improve a firm’s profit performance, but they do not know how to measure this performance nor do they know how much should be invested in IT.”*

Thus, there are enduring questions that continue to plague IS professionals, senior management and IS researchers regarding IS investments (Robson 1997):

1. What is the exact dollar spend on IS investments?
2. What are the benefits that accrue from these investments?
3. How are these IS investments evaluated (and when)?
4. Why do IS costs, as reflected in IS budgets, continue to rise when unit costs are falling?
5. How can organisations regain their belief in IS returns?

Questions 1 and 2 are pertinent to this research, however issues relating to IS evaluation (question 3), though important, are beyond the scope of this research. Questions 4 and 5 will be discussed within the context of this research as they have implications for the decision-making process relating to the acquisition of IS investments.

This study therefore builds on prior research in this complex field of IS research and proposes a *Conceptual Model* (Chapter 4) designed to:

- (i) Define and explain the relationship between IS investment and organisational performance in the FSS.
- (ii) Demonstrate the effect of managerial practice on IS effectiveness and efficiency, which in turn are deemed to affect organisational performance for the FSS.
- (iii) Show how different components of an organisation's IT portfolio are likely to have varying effects on that organisation's performance within the FSS.
- (iv) Illustrate how the performance of organisations affects IS strategic planning and investment levels.
- (v) Investigate the existence (or otherwise) of a "threshold" for the level of investment in IS.

The FSS was chosen as the focal industry for this research since it continues to invest heavily in IS and naturally expects a high return for its investment (Barua, Kriebel and Mukhopadhyay 1991).

The following section presents definitions of the main conceptual foundations upon which this research is built. As shall be demonstrated, it became necessary to derive and explicitly state these definitions a priori as there is an apparent lack of consistency in the literature regarding the use of some terminology in the IS discipline.

### **2.3 Definitions**

Despite the widespread use of IS, it is a well-known (and often glossed over) idiosyncrasy in much of the existing IS literature that the very definitions of what constitutes IS and IT have been problematic (Boaden and Lockett 1991). It may be argued that inconsistency in definition may have contributed to some of the problems and weaknesses identified and discussed later in this chapter. Therefore, in order to bring a measure of consistency in use of terminologies and hence address these



problems, this section presents a series of definitions that will be adopted and used throughout this research.

A number of reasons have been put forward in an effort to explain these inconsistencies, the two most notable being: a) the dynamic nature of the field itself (Weill and Olson 1989) and, b) the rapid rate at which technology is introduced into organisations (Dos Santos 1991). Furthermore, and with respect to the relationship with organisational performance, one of the shortcomings of many earlier studies has been the focus on technology in the main. This, coupled with the aforementioned lack of consistent definitions, could also have created a situation where different technologies were researched and results subsequently found to be difficult to generalise from. The lack of uniform definitions consequently poses an interesting dilemma – if there do not appear to be any consistent definitions, *how then can the issue of where to direct the investment of scarce organisational resources be resolved?*

To illustrate this dilemma, consider the following definitions for Information Technology and Information Systems. The first example is taken from the Australian Bureau of Statistics' standard classification of education Website. This definition describes Information Technology as a broad field covering (ABS 2001):

*"...the study of the processing, transmitting and storage of information by computers...[and] includes:*

- *Computation theory*
- *Computer programming data format and coding*
- *Management, storage and retrieval of information in a computer environment*
- *Robotics programming and artificial intelligence*
- *Systems analysis*

*The main purpose of this broad field of education is to develop an understanding of information systems, programming languages, information management and artificial intelligence, and the ability to apply*

*them to solve problems. This broad field comprises the narrow fields (computer science, information systems)\* listed below but excludes: Computer hardware design and construction. Computer Engineering. Computer operation and using software packages.”*

*\* Edited for clarity.*

The above definition is typical of the ambiguity surrounding the use of the terms Information Systems and Information Technology in non-academic circles (Boaden and Lockett 1991).

However, this ambiguity is not entirely limited to non-academic circles. McKeown (2001) recognised the aforementioned lack of clarity and attempted to provide better definitions. Thus McKeown (2001, p376) defined Information Technology as “*all forms of technology used to create, store, exchange and use data, information and knowledge*”. This definition, though more appropriate, is less explicit as it falls short of defining what constitutes ‘technology’. Carr (2003) agreed with this assessment and suggested that IT was a ‘fuzzy term’. Further, McKeown (2001, p376) defined an Information System as “*a system that converts raw data into information that is useful to managers and other interested parties*”. Again, this definition is broad and fails to explicitly define what constitutes an Information System. Furthermore, the definition does not take into account the fact that an Information System is composed of more than just the technology used for processing data/information/knowledge.

Given these inconsistencies, the following definitions have been derived and will be assumed henceforth.

### **2.3.1 Information Technology (IT)**

*Information Technology is a collective term that represents the means by which data, information and knowledge are captured, processed, communicated and stored.*

In organisations, Information Technology is represented by investment at three levels, namely, Infrastructure, Core Processing Systems and Decision Support/Management Information System.<sup>1</sup>

### **2.3.2 Information System (IS)**

*An organisation's Information System(s) is that combination of resources consisting of Information Technology, Human and Organisational organised in such a manner that they are directed towards achieving a given set of objectives.*

The foregoing definitions of IT and IS are considered more complete and unambiguous because they clearly identify what both terms refer to and their constitution. In the case of IT, this definition also highlights the fact that not all IT is the same and in the case of IS, the definition stresses the fact that IT is in fact a subset of IS.

*Thus, and unless otherwise stated, the term Information Systems (IS) will be used by default and assumed to have the above definition.*

### **2.3.3 IS as an Investment**

Having established formal definitions of IT and IS, it is necessary to explain the validity of viewing IS expenditures as investments and expand upon what constitutes IS investments.

#### Capital Formation

A formal definition of investment or capital formation as given by the Australian Bureau of Statistics (ABS 2002) states:

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<sup>1</sup>The term 'system' here is used in its literal sense meaning a collection of things, in this case technologies, working together (Soanes, 2000)

*“Capital formation (commonly termed 'investment') is the process of creating fixed assets - such as machinery and buildings - that can be used for production of goods and services.”*

*Therefore, IS investment is the process of capital formation through the acquisition of Information Systems assets.*

### IS Investment Trends

It is undisputed that IS have become an integral part of most, if not all, contemporary organisations. Its roles have also changed over the years, from a highly technological focus, based primarily on process/production efficiency, to the present day strategic focus (Ward, Griffiths and Whitmore 1990; Sohal and Ng 1998). Ballantine, Galliers and Stray (1996, p129) highlight the fact that the role of IS has changed from *“automating to informing... to transformation”*. Given this dynamism, levels of expenditure in IS have continued to increase as the variety of applications and uses (communication, e-mail, office automation, MIS, EIS, SIS) have grown.

Carr (2003) observed that in 1965, capital expenditure on IT was less than 5% of total capital expenditures in American companies, rising to 15% in the 1980s, 30% in the early 1990s and almost reaching 50% by the end of the 1990s. Campbell (1992) estimated these expenditures were rising by almost 12% each year in the United States of America alone. On the other hand, IS expenditure in the United Kingdom had increased almost ten-fold since 1980 (Carrington, Llanguth and Steiner 1997). Renkema and Berghout (1997) noted that up to 50% of capital expenditures of large organisations are IS related and Seddon, Graeser and Willcocks (2002) estimated that total worldwide expenditure exceeded one trillion US dollars per annum in 2001. According to an Australian Bureau of Statistics report (ABS 2002), “Real gross fixed capital formation per capita grew strongly during most of the 1990s. Between 1990-91 and 2000-01 it rose by 3.1% a year on average. During the past decade, private sector capital formation accounted for around four-fifths of the total. Purchases of Information Technology (including computer hardware and software) are among the fastest growing components.”

Although one might infer that increasing expenditure in IS would lead to an increased IS cost base, Harris and Katz (1991) demonstrated that higher IS spending did not automatically lead to higher IS cost ratios. As a cautionary note however, a PIMS (1984) study, cited in Weill and Olson (1989), warned that caution needs to be exercised in interpreting such expenditure with respect to organisational performance as increased spending may only result in increases in productivity if the organisation has a superior market position.

With these reported increases in IS expenditure, the increased reliance by organisations on IS and the shift in emphasis on IS from simply being a mechanism for automation (Willcocks and Lester 1999) to a resource that provides both strategic and competitive advantage (Porter and Millar 1985; Narayanan 2001), one begins to appreciate the validity of viewing such expenditure as investments. Moreover, capital expenditure on IT results in two types of assets, the first being *tangible* assets such as hardware and software that are balance sheet items and are treated as assets which can and are depreciated (Frenzel 1992). The second type of asset is an *intangible* asset, the Information asset – with by-products such Competitive/Business Intelligence and Knowledge that are much more difficult to account for in the traditional sense (Pearlson 2001). In fact, some authors have argued for the application of techniques such as ‘Real Options’ analysis (Dos Santos 1991; Benaroch and Kauffman 2000) thereby contending that IS investments should be treated as any other (potential) investment. Thus, Dos Santos (1991) likened investment in new technologies to the purchase of a call option and derived an ‘Options model’ utilising *Options Pricing Theory* to create and analyse a number of IS investment options that could then be used as a basis for decisions to invest in particular technologies.

What the preceding discussion demonstrates is the general acceptance of the perspective that IS expenditures are indeed an investment. These arguments are also congruent with the Resource Based View of the firm as espoused by Barney (1991). Chapter 4, Section 4.2.1 presents a detailed discussion of Resource Based View theory as applied to IS investment.

Naturally, there are many drivers for IS investment and this research explores many of them in the context of the FSS in Australia. However, in the simplest sense, IS

investments present four key benefits to an organisation (Mckeen and Smith 1996) namely: 1) Better cost management, 2) Improved productivity, 3) Improved risk management and 4) Better customer management. It is on the subject of improved productivity that much of the debate regarding the impact of IS has centred and on which this research primarily focuses.

#### **2.3.4 Organisational Performance**

*Organisational performance is the extent to which an organisation is able to marshal its resources to create products and/or services efficiently and at a reasonable cost to consumers.*

The above definition was derived using two distinct, but related, theories: (a) Theory of the organisation (Robbins 1987), and Stakeholder theory (Freeman 1984). Both suggest that an organisation consists of a collection of stakeholders – individuals and groups that deliver a set of products and/or services. Further, the concept of a stakeholder has been extended to include shareholders, customers, suppliers and other organisations (Key 1999).

Since organisational performance is measured via a set of performance indicators (Bazley et al. 1993), typically determined by stakeholders (D'Souza and Williams 2000), it is arguable that one can gain a better understanding of those performance related issues believed to be important to an organisation by understanding the composition of the set of indicators in question (Mckeen and Smith 1993b; Mahmood and Mann 1993).

Thus, not all organisations will use the same performance indicators, although, it is reasonable to assume that organisations operating in the same industrial sector are more likely to use the same or similar performance indicators (Barkos 1987). This presents a number of challenges as different researchers have used different sets of indicators, depending on their research focus, thereby creating a situation of ambiguity as to which are the most relevant/appropriate measures of and for organisational performance (Palmer and Markus 2000).

Consequently, identifying and defining appropriate indicators/measures may not be a simple and straightforward task. One may need to resolve the different and, sometimes diverging, perspectives of what stakeholders believe to be the 'best' indicators of an organisation's ability to deliver its services (Palmer and Markus 2000).

### *Indicators of Organisational Performance*

As alluded in the preceding sub-section, organisations employ a variety of performance indicators. In the literature, these performance indicators are typically defined as independent, dependent or control variables depending on the research objectives and design. A meta-analysis (Chapter 3) of the literature on the relationship between IS investment and organisational performance found 116 dependent variables, 29 control/intermediate variables and 138 independent variables. These findings are in keeping with observations by Barkos (1987, p12), who stated that:

*“In the context of organisational impacts of Information Technology, alternative perspectives lead to different dependent variables and suggest the use of different theoretical tools for the study of those impacts”*

This confirmation of the multiplicity of variables (indicators) further corroborates the complexity of conducting research in this field of research, supports assertions in the literature as to difficulty of cross study comparisons and suggests that researchers need to develop a system of classification for these variables that would create a smaller more manageable set of variables (Palmer and Markus 2000). Such a set would lead to more consistent research designs and would contribute to better comparability and generalisability of results. It has been noted in much of the literature that the use of quantitative (financial) performance measures such as Return On Sales, Return On Investment, Growth In Revenue, Sales Growth, to name a few, is pre-dominant and this could serve as a starting point (Chan 2000).

In the case of FIs, performance may be measured by a number of key indicators including Interest Income, Non-Interest Income, Operating Expense and Credit

Quality (financial risk) (Campbell 1992). The difficulty lies in determining how IS investments actually impacts on these indicators. Further, since investing in IS alone may not produce sustainable performance advantages, SISP activities do need to be complemented with a comprehensive corporate strategy (Powell and Dent-Micallef, 1997). As shall be demonstrated later, the role of management in an organisation is a factor that also plays an important role in the IS investment and organisational performance relationship.

Thus, one of the objectives of this research is to identify those Key Performance Indicators (via the conceptual model) that are most suitable to, or are commonly used in, the FSS and thereby enhance current knowledge on the IS investment and organisational performance relationship.

### **2.3.5 IS Investment Threshold**

It is generally agreed that organisations in general, and FIs in particular, need to maintain a certain level of IS expenditure in order to remain competitive (Willcocks and Lester 1999; Harker and Zenios 2000a). However, there appears to have been little work done in the field to determine what might be considered an appropriate minimum level of IS investment and understand how this could affect organisational performance.

Bender (1986) first observed this phenomenon whilst conducting research in the insurance industry. His observations led to the conclusion that this threshold was approximately 15% of total general expenditure. Specifically, after comparing information processing expenses with total expenditure, Bender (1986) noted from his sample of 132 companies that 22 companies had a ratio of between 5% and 10%, 35 companies had a ratio of between 15% and 20%. After plotting information processing expenses against general expenses, Bender (1986) concluded that there seemed to be an optimum level or threshold of IS investment of around 20% to 25% for the insurance industry. It is noteworthy that since Bender's (1986) research, there has been very little (or no) specific research into the phenomenon of an IS investment threshold, although much of the subsequent research has utilised similar techniques in trying to determine the relationship between IS investment and



organisational performance (Harris & Katz 1989; Weill & Olson 1989; Banker, Kauffman & Morey 1990)

Bender's (1986) research also suggested that lower IS expenses do not necessarily correspond with higher performance, in fact that the reverse might be true, lower expense might lead to lower performance relative to the industry, results that were later supported by Harris and Katz (1988) and Harris and Katz (1991). Bender (1986) therefore successfully argued that organisations operating in any given industry require a certain level of investment in IS to remain competitive.

Thus, the establishment of such a threshold, particularly in the FSS, could have significant implications for the management of IS investments in FIs as it could provide a benchmark by which FIs could compare their respective IS expenditures. Determining such a threshold for an industry could in turn contribute significantly to the Strategic Information Systems Planning (SISP) process in that the threshold could be viewed either as an **enabler** when justifying expenditure relative to other FIs, or conversely, a **limiter** when used to cap IS expenditures. Further, if one were to analyse the FSS utilising a framework such as Porter's (1979) competitive forces model, it would be evident that an IS investment threshold could act as one of the barriers to entry for new competitors to the FSS.

### 2.3.6 Strategic Information Systems Planning

Lederer and Sethi (1988, p445) defined Strategic Information Systems Planning as:

*“...the process of deciding the objectives for organisational computing applications which the organisation should implement.”*

With the increasingly strategic importance of IS, the scope of SISP has expanded and now covers more than the highly technical focus expounded by Lederer and Sethi (1988). Thus SISP activities now incorporate effective management of: (a) Information, (b) Information Technology, (c) Information Systems, and (d) other organisational aspects (Earl 1993; Ward and Peppard 2002). Research into the execution of SISP suggests that there are a number of methods or approaches that organisations may adopt: (a) Business led approach, (b) Method driven approach,

Administrative approach, Technological approach and (e) Organisational approach (Earl 1993). The literature therefore suggests a set of nine (9) 'considerations' for SISP (Weill and Olson 1989; Earl 1993). These are discussed in more detail in Chapter 4, Section 4.4.3.

### **2.3.7 Managerial Effectiveness**

The role of management in the relationship between IS investment and organisational performance relationship is without doubt viewed as a critical aspect (Rockart 1982; Powell and Dent-Micallef 1997; Seddon, Graeser and Willcocks 2002). Further, Harris and Katz (1989) found that the management of IS investments was equally as important as the actual investments themselves.

Banker, Kauffman and Morey (1990) identified what they termed the Intermediate production process as being an important factor in complex managerial environments. Weill (1992) referred to this construct as Conversion effectiveness and suggested that it encapsulates several factors that highlight the need for management involvement in order for IS investments to produce the required value in terms of increased organizational performance.

Markus and Soh (1993) also provided support for this construct and further argued that Conversion effectiveness was affected by IT management activities (such as formulating IS strategies, structuring for executing IS strategy, pursuing the right applications, managing IS projects effectively) and structural factors (such as industry and organisational size). Davern and Kauffman (2000) discussed a similar construct that they termed Conversion contingencies.

This research applies the concept of Conversion effectiveness and redefines it as *Managerial effectiveness* to more clearly highlight management's role in the IS investment and organisational performance relationship. Chapter 4, Section 4.4.4 presents a detailed discussion of Managerial effectiveness.

### 2.3.8 Productivity Paradox Revisited

Robert Solow, cited in Brynjolfsson (1993, p67), is credited with making the following comment with respect to the relationship between IS investment and organisational performance.

*“We see computers everywhere except in the productivity statistics.”*

Roach (1988) investigated IS expenditure in a variety of sectors with respect to changes in productivity and noted an apparent mismatch between increased capital investment in computers and relatively stagnant growth in white-collar productivity in the United States of America, which he termed a ‘productivity puzzle’.

Using economic data Roach (1988) noted that by 1985, the American service sector including banking and insurance owned a total of approx 84% of total IT assets. Roach (1988) also noted that there had been a consequent decrease in investment in buildings, transportation and basic industrial capital whilst investment in IS increased. Roach (1988) further noted that capital investment in IS within the FSS approximated 25% to 30% of total assets (consistent with earlier observations by (Bender 1986)).

Whilst Roach (1988) acknowledged the difficulty of measuring the productivity of white-collar workers, the single most important contribution of that piece of research was the identification of the productivity puzzle, later to be termed the *productivity paradox*, that spurred much debate into the actual contribution of IS investment to organisational performance and that has contributed significantly to the growth of knowledge in this area.

As a consequence of foregoing issues regarding the productivity impacts of IS (or lack thereof), Markus and Soh (1993) noted with concern the high level of consensus on the productivity paradox even as firms continued to invest heavily in IS (evidenced by the preceding discussion on the trends in IS investment). Brynjolfsson (1993) later argued that the paradox may not have been as significant as earlier research suggested and proposed the following reasons as explanation:

1. Lack of suitable measures for output and inputs

2. Time lags in benefit realisation due to learning and adjustment
3. Redistribution and dissipation of profits
4. Mismanagement of either (or both) of information and technology

In later research, Brynjolfsson and Hitt (1996) concluded that the productivity paradox disappeared in the period 1987–1991 and that IS spending had indeed made substantial and statistically significant contributions to firm outputs. In drawing their conclusions, Brynjolfsson and Hitt (1996) argued that earlier studies might have been inconclusive for a number of reasons including:

- Problems in data collection such as unavailability or difficulty of collecting firm level data.
- Lack of generalisability of results.
- Increases in product variety and quality are difficult to capture yet are part of the value that IS spending brings to the firm.
- Zero or weak correlations do not necessarily indicate low payoff of technology.

Stratopoulos and Dehning (2000) concurred with the foregoing observations and further argued that although previous studies may not have been able to demonstrate a positive correlation between investment and performance, this should not be interpreted as meaning that IS investments did not make any contribution to performance. Despite these observations, Carr (2003) recently revived the debate on productivity paradox by suggesting that greater expenditure on IS does not necessarily translate into higher performance, but rather that the converse may apply.

van Nievelt (1999) also investigated the productivity paradox and argued that even though the concept was ‘interesting’, it had no foundation as IT clearly contributes to performance. To support this assertion, van Nievelt (1999) argued that traditional productivity functions as used by economists at the macro economic level were not suitable for analysing IS contributions at the organisational level. This argument supports others in the literature that suggest that the productivity paradox could in effect have been created by mismeasurement and in effect, debunked the whole concept of the productivity paradox (Kauffman and Weill 1989).

The foregoing arguments are highly plausible and suggest a counter argument that the relationship between IS performance and organisational performance is best judged using the organisation as the unit of analysis. One weakness in van Nieveldt's (1999) and other earlier research however, was the attempt to control for the effects of context in the research design and analysis. It can be argued that eliminating or controlling for industry effects has the net effect of 'clouding' the effects of context that are sometimes a critical determinant for the investment/performance relationship (Avgerou 2001; Li and Ye 1999).

Frei, Harker and Hunter (2000) provided an excellent example (from a Research Council, 1994 study) of the productivity paradox in action. Frei, Harker and Hunter (2000) noted that, increased investments in technology within the FSS have resulted in quality and availability of customer self-service facilities such as Automated Teller Machines (ATMs) and Internet banking, yet these improvements may not be reflected as higher output in a macro economic sense. In addition, Devaraj and Kohli (2000) made the following observations with respect to the IS investment and organisational performance relationship:

- One of the possible causes of equivocality may have been that IS payoff was being considered in isolation to other issues, such as BPR.
- The need to consider time lags.
- The effect of IS investment on non-financial measures such as customer satisfaction and quality.
- Even when IS investments are shown to bring improvements to intermediate production variables, the net effect may not necessarily lead to higher productivity.

Devaraj and Kohli (2000) further argued that many earlier studies, although supposedly focused at the industry level, were in fact economy level studies since they were cross-sectoral and consequently encompassed wider sections of the economy.

Dewan and Kraemer (2000) on the other hand explored the issue of IS investment and productivity at a country level. Data from 36 countries were utilised and

comparative analyses conducted between developed and under-developed countries. Results indicated higher levels of returns from IS capital in the developed nations compared to the under-developed nations. It was noted however that, returns from non-IS capital were higher in under-developed countries compared with more developed countries. This study provided an insight into the productivity paradox from an international perspective.

Given the objectives of this research, it is evident that the question of the productivity paradox (and the surrounding issues regarding IS investment and organisational performance) is extremely relevant to understanding the relationship between IS investment and organisational performance and hence the divergent (and sometimes conflicting) perspectives need to be reconciled in the context this study.

## 2.4 Financial Services Sector in Australia

### 2.4.1 Background

The FSS is an important part of any economy, and the FSS in Australia is no exception (Duncan and Elliot 2002).

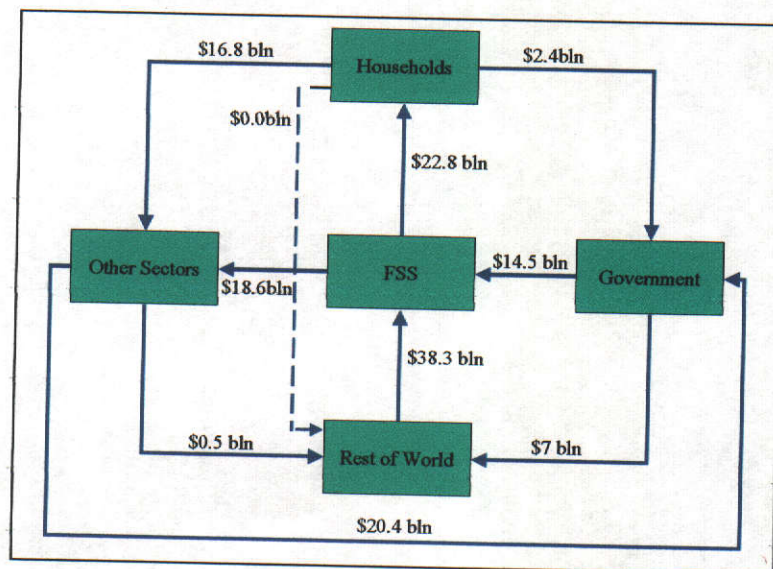


Figure 2.1: Significance and importance of FSS in Australia (Adapted Trewin (2000))

By definition, FIs are “financial intermediaries – acting as conduits through which the funds of many savers are channelled to borrowers who cannot raise money directly” (De Lucia and Peters 1998, p16). Amongst its many roles, the FSS is also a major employer, handles payment and facilitates/processes financial transactions as shown in Figure 2.1, which illustrates the integral role the FSS plays in the economy (amounts shown in Figure 2.1 indicate net financial flows as at 2000 (Trewin 2000).

De Lucia and Peters (1998) supported these observations and further suggested the following issues, in particular as having contributed significantly to changes in the FSS:

- Deregulation of the industry in general
- ‘Floating’ of the exchange rate
- Impact of Information Technology
- Dynamism and instability in the world economy
- Customer satisfaction

#### **2.4.2 Composition**

The Financial Service Sector (FSS) in Australia is regulated by the Australian Prudential Regulatory Authority (APRA). Prior to APRA’s establishment, supervision and regulation of the FSS was fragmented with different sub-sectors reporting to different regulatory bodies (Dale 1996; Gizycki and Lowe 2000).

Figure 2.2 summarises the distribution of Authorised Deposit-taking Institutions (ADIs) in the Australian FSS. Although, credit unions constitute the largest industry (by size), over 70% of all deposits are handled by banks making them the largest deposit-taking institutions in Australia. There are four major banks, which dominate the Australian market: the Australia and New Zealand Banking Group (ANZ), Commonwealth Bank of Australia, National Australia Bank (NAB) and Westpac Banking Corporation. These are the so-called ‘Four Pillars’, from which the ‘Four

Pillars' policy derives its name. Together, these four banks hold almost two-thirds of the total assets of all banks in the Australian FSS (Harper 2000).

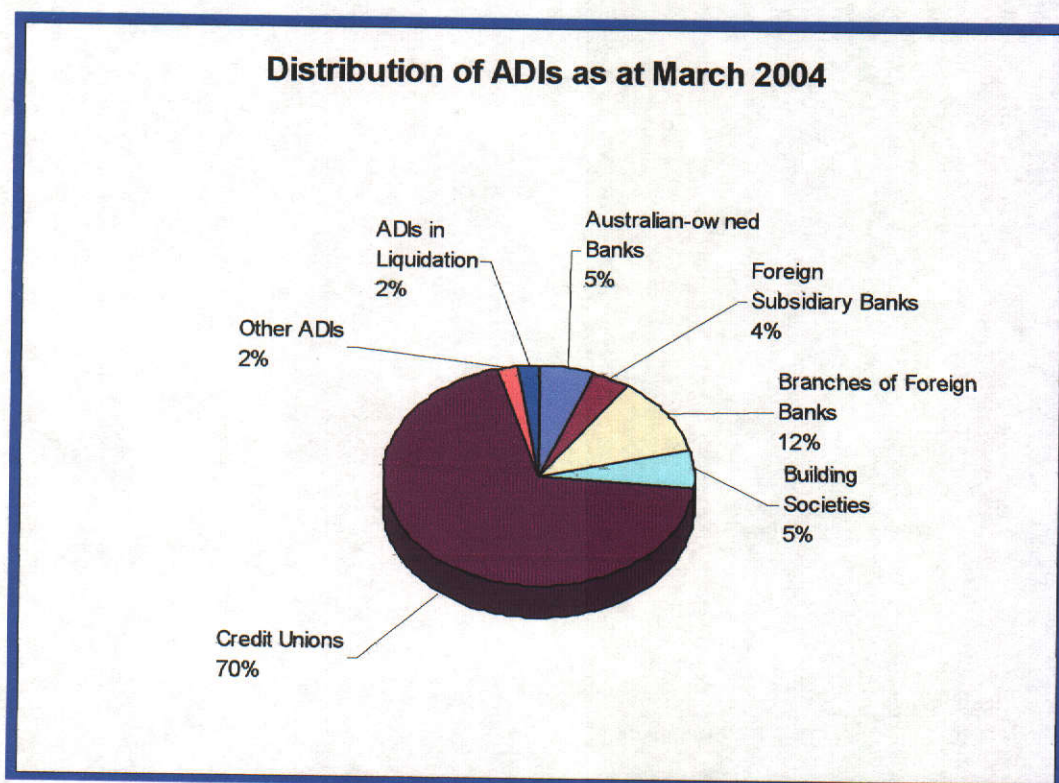


Figure 2.2: Distribution of ADIs in the Australian FSS

As at March 2002, the Australian FSS continued to outperform other sectors of the economy (by over 2%) with year to date performance rising to 6% (Brown et al. 2002). Internationally, the Australian FSS' relative share price also showed strong performance growth of close to 13% for the twelve months to February 2002. In comparison, the United States index recorded 9.9%, the Canadian financials 10% and the United Kingdom bank index 10.3% for the same 12-month period.

Looking back, in the past fifteen years up-to 2000, the finance and insurance industries combined have exhibited a very strong growth rate of up-to 159% (Trewin 2000). In comparison, the Australian economy as a whole only posted a total growth of 72% for the same period. Much of this growth has occurred during a period of wide-ranging reform and deregulation of the FSS (Dale 1996; Edey and Gray 1996; Llewellyn 1996).



### **2.4.3 A Porterian analysis of the FSS**

The works of Michael Porter on the forces that influence competition in an industry (Porter 1979) and the competitiveness of nations (Porter 1990) have resulted in two analytical tools that have gained much acceptance in both academic and professional circles (ten Have et al. 2003). The suitability of these models been proven extensively as evidenced by their use in diverse research such as:

- American Northwest Hardboard industry (Munk and Shane 1994)
- FSS in Japan (Turner 1994)
- American airline industry (Kling and Smith 1995)
- Irish Shellfish processing industry (Ryan, Pitts and Lenihan 1998)
- Competitive advantage of a country – Saudi Arabia (Jasimuddin 2001)

Thus, both models provide simple and convenient, yet powerful tools for understanding the characteristics and behaviour of an industry and an economy (Miller and Dess 1993). Consequently, as reported later in this section, Porter's (1990) model on competitiveness was utilised in this research to better understand the many issues that influence the FSS in Australia. This analysis is complemented with a closer and more detailed look at the five forces (Porter 1979) and how they have, and continue to, influence FIs within the Australian FSS.

#### *Understanding the Competitiveness of the FSS*

The analysis reported in this sub-section was derived from a number of sources: Crapp and Skully (1985), Dale (1996), Llewellyn (1996), Gizycki and Lowe (2000), Harper (2000), Trewin (2000), Brown et al. (2002), Duncan and Elliot (2002), Reynolds and Ochalla (2003) and Thornhill (2003) and clearly shows the characteristics of the Australian FSS.

Porter (1990) suggested four drivers that may be used to describe the competitiveness of an industry: (a) Demand conditions, (b) Firm structure, strategy and rivalry, (c) Related and supporting industries and (d) Factor conditions. Utilising these components, an analysis of the Australian FSS was conducted as shown in Figure 2.3.

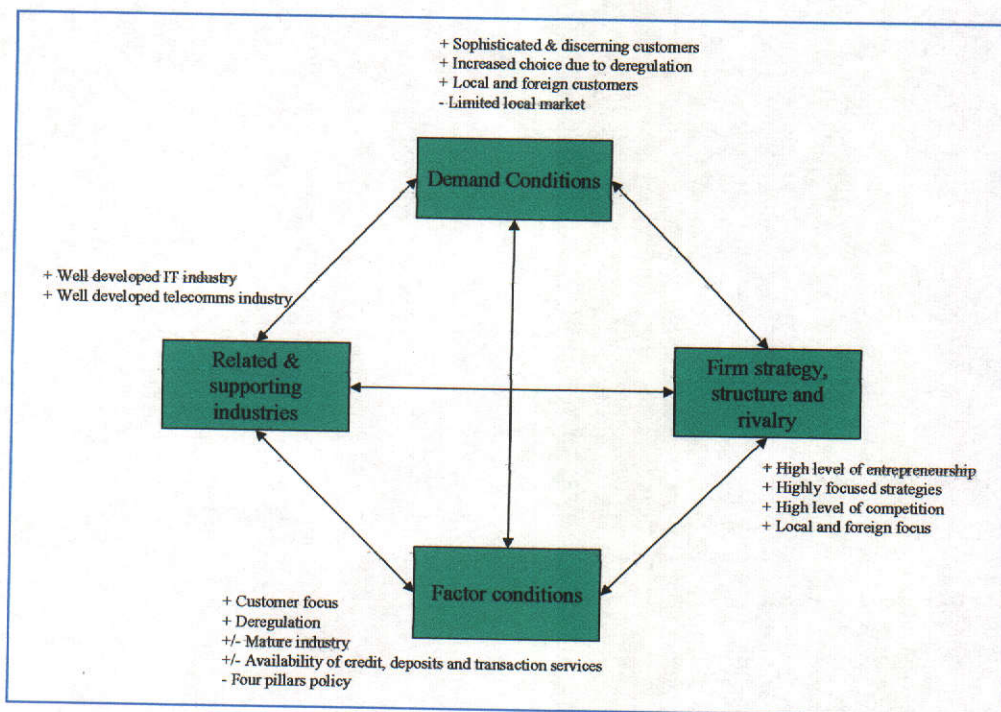


Figure 2.3: A Porterian analysis of the FSS in Australia

‘Demand conditions’ within the FSS arise from a number of drivers. Positive drivers for growth include sophisticated and discerning customers, increased choice of possible suppliers of financial services due to deregulation and access to both local and foreign customers. The main counter agent for growth in this market is the fact that it is a limited market in terms of size of local population compared to other markets in the developed world (Trewin 2000).

Turning to the ‘Firm structure, strategy and rivalry’ aspect, it was noted that FIs in Australia exhibit a high level of entrepreneurship as evidenced by the fact that some of the larger FIs have built organisations that operate and are able to compete on a global scale. Thus, some FIs may have both a local and a foreign focus. Further, segmentation within the FSS denotes the development and application of highly focused competitive strategies (Differentiation, Cost leadership or Niche/Focus)

within the market (Porter 1980). Furthermore, and as will be discussed shortly, the FSS exhibits a high level of competition and rivalry between existing players.

The impact of the 'Related and supporting industries' aspect works in conjunction with the foregoing. For the FSS in Australia, two important industries stand out, the Information Technology sector and the Telecommunications sector (Trewin 2000). Both are highly developed and as such are able to offer appropriate support thus enabling the FSS to implement its IT-based strategies.

Finally, 'Factor conditions' also influence the competitive nature of the FSS. As alluded to earlier the FSS is a mature industry with a broad product mix that consists primarily of deposit-taking, offering of credit and provision of transaction services (De Lucia and Peters 1998). A key driver for competition has been the need to have a strong customer focus and this is an area that the credit union industry in particular has led the competition (Duncan and Elliot 2002; Reynolds and Ochalla 2003). Further recent changes in the FSS due to deregulation have resulted in increased competition that has had a positive effect on the growth within the industry (Wallis et al. 1997). However, there is one issue that continues to have a possible negative effect and that is the 'Four pillars' policy, whereby the regulating authorities will not allow any mergers between any of the four large banks (Harper 2000). This policy is designed to protect the local FSS market by ensuring an environment suitable for competition persists within the FSS.

### *Understanding the Five Forces*

To complement the foregoing analysis, Porter's (1979) five forces model was applied to the Australian FSS resulting in the analysis illustrated in Figure 2.4 and discussed in the following sub-sections.

#### **Rivalry Amongst Existing Competitors**

As discussed earlier in Section 2.4.2, the Australian FSS consists of a relatively large number of players in what may be considered a limited market. The reader's

attention is drawn to one noteworthy issue regarding rivalry and competition between existing competitors and that is the fact the two industries targeted in this research (credit union and commercial/retail banking) do experience direct competition between themselves in the retail segment of the market. Further, Commercial/retail banks currently do not enjoy a good reputation in Australia as they are generally perceived to be highly profit driven at the expense of their customers (Reynolds and Ochalla 2003) and this has provided credit unions with a remarkable opportunity to use customer service quality as a differentiator between themselves and the banks (Cooke 1989).

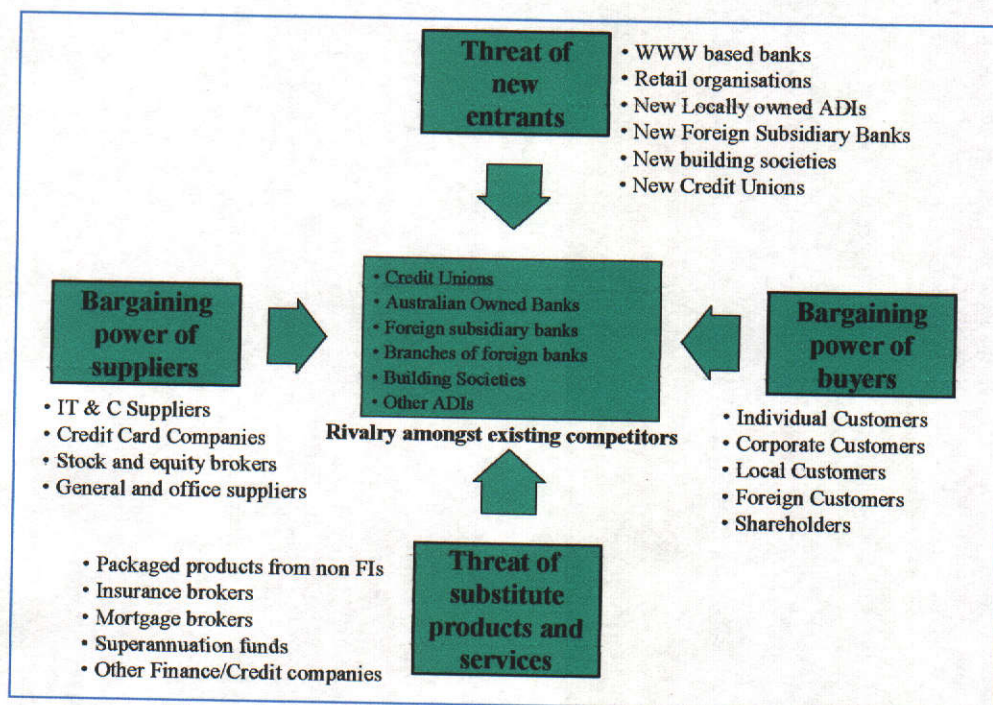


Figure 2.4: A five forces model of the Australian FSS

A recent survey by Reynolds and Ochalla (2003) highlighted this rather poignantly when it found that only 11% of bank customers claimed that they were very satisfied with the service that they received compared to 64% of credit union members who claimed to be very satisfied with their FIs. This is in keeping with observations by Crapp and Skully (1985) and Cooke (1989). Further afield, in the United Kingdom, a similar situation has been observed in the credit union and commercial/retail bank polarisation where credit unions have consistently outperformed the banks in terms of customer service (Duncan and Elliot 2002).

Clearly, the FSS is an industry that exhibits a high level of competition between existing players, as they jockey for position, and compete in a limited market (Trewin 2000).

### **Bargaining Power of Suppliers**

In any market, suppliers can exert pressure and affect the final price or the quality of the product delivered to the customer and the FSS is no different (Munk and Shane 1994). As an example, consider the supply of credit card services. Most if not all FIs that offer such services utilise providers such as Mastercard, Visa, and American Express. Consequently, the cost of providing credit card services is determined to a greater or lesser extent by the cost of these services to FIs and many of these costs are eventually passed on to the customer (Thornhill 2003). Further, IT plays an integral role in the supplier/customer relationship between FIs and their various suppliers, as it is both the means of production (e.g. ATM, EFT/POS terminal, transaction processing and communication systems) and the product (electronic transaction).

### **Bargaining Power of Buyers**

A limited market such as the Australian economy suggests that buyers (customers) have a stronger bargaining position as they can play competing FIs against each other (Porter 1979). This is also made possible by the similarity in the products offered by FIs. Consequently, opportunities exist for FIs to differentiate themselves and their products in order to reduce the bargaining power of buyers. As shown in Figure 2.4, customers for FIs may be grouped into: a) individual customers (local and foreign), b) corporate customers (local and foreign) and, c) shareholders. As alluded to earlier, IT is an important part of this relationship as it enables these customers to have access to the products offered by FIs through a variety of channels.

### **Threat of New Entrants**

This aspect of the five forces model depicts the effect that new entrants may have on an industry (Porter 1979). Given that the Australian market is limited, new entrants would have to fight for a share of the existing market and this would put pressure on profitability and pricing in the FSS (Munk and Shane 1994). Though the entry of new players into a market may be a boon for customers as it signals the advent of greater competition, choice, and (theoretically) cheaper products, it does not always augur well for existing players within that market and may lead to the industry restructuring itself through mergers, acquisitions or even withdrawal/retirement of weaker FIs (Lilja 1999). Potential new entrants into the FSS include, World Wide Web based FIs, retail organisations, and new FIs in any of the six categories identified in Section 2.4.2 (Llewellyn 1996). IT plays a key role in this aspect of the five forces in that it lowers barriers of entry and facilitates increased competition through the availability of low cost banking and ancillary systems (Byers and Lederer 2001). Existing FIs may protect themselves from new entrants through a number of strategies including raising the switching costs for their customers thereby discouraging them from moving to the competition (Porter 1979). However, it should be noted that entry into a regulated industry such as the FSS does require approval from the regulating authority and is contingent on the potential new entrants satisfying a set of stringent regulations.

### **Threat of Substitute Products**

The Australian FSS is a mature industry that is characterised by well-informed and sophisticated customers. However, it is a well-known characteristic of the FSS that many of the products on offer are very similar (Krishnan et al. 1999). Consider the case of a savings account – most FIs offer a variety of savings account products, but in essence, the concept behind the savings account is the same. However, FIs differentiate their offerings in this category by attaching certain features or services to the product, such as: attractive interest rates, the presence/absence of transaction fees, the ability to link this product with other products e.g. a cheque account, money management account etc, or the ability to execute a given range of transactions.

Despite the foregoing, FIs face possible challenges from the introduction of new products particularly from non-traditional competitors who have entered the market because of deregulation (Byers and Lederer 2001). Consequently, any substitute products introduced into the market would have to offer very attractive price/performance characteristics in order to overcome the inherent switching costs of existing products. In this regard, IT plays an important role in helping FIs package together a variety of services, thus enabling FIs to differentiate themselves at the product level (Byers and Lederer 2001).

The foregoing suggests that any new products entering the market would have the net effect of limiting the prices of existing products thereby reducing profitability (Porter 1979). To recoup any potential losses, FIs would have to increase their volume (market share or share of customers' wallet), but as suggested earlier, in a limited market such as the Australian FSS, this is no mean task.

Thus, it can be seen from the preceding analyses that the FSS is a highly competitive economic sector that plays a significant role in the Australian economy. In addition, the FSS is a significant investor in IS and consequently, IS plays a crucial dual role as both a means of production and as a product as deduced from both the competitive (Figure 2.3) and the five forces (Figure 2.4) analyses of the Australian FSS (Holland and Westwood 2001). This makes the FSS in Australia an excellent choice in which to study the relationship between IS investment and organisational performance.

#### **2.4.4 Regulatory Framework**

According to Mishkin (2001), a sound FSS is essential to the health of an economy. Consequently, each country's FSS bears close scrutiny from regulating authorities and the Australian FSS is no exception (Lilja 1999).

Table 2.1 shows the pre-1997 regulatory structure of the Australian FSS (Wallis et al. 1997).

Regulator	Financial Institutions
Reserve Bank of Australia	Banks
Australian Financial Institutions Commission	Credit unions Building Societies Special Service providers
State Authorities	Public trustees Friendly societies Cooperative housing societies State government owned insurance offices Trustee companies
Insurance and Superannuation Commission	Life Companies Superannuation (pension) funds General Insurers
Australian Securities Commission	Unit Trusts Merchant Banks Pastoral Finance Companies Finance Companies

Table 2.1: Australian Regulatory Framework pre-1997

FSS supervision effectively came into being with the establishment of the Reserve Bank of Australia through the enactment of the Reserve Bank Act (1959). Prior to that, supervision was the responsibility of the Commonwealth Bank, which had until then acted as the central bank (Mishkin 2001).

In 1979, the Australian Federal government instituted an enquiry (the Campbell Committee) into the FSS with two main objectives: 1) To investigate and make recommendations on the structure of the FSS and 2) To investigate and make recommendations on regulation and control of the FSS. The most notable result of the Campbell report was the deregulation of the Australian FSS.

1983 saw the establishment of the Martin Committee to review progress made after the Campbell report. In essence, this report recommended the relaxation of controls that would further facilitate competition within the FSS (Mishkin 2001). In 1996, the Federal Treasurer of Australia, the Hon. Peter Costello MP, commissioned an inquiry



into the FSS, chaired by Stan Wallis, and later to be known as the Wallis Inquiry (Edey and Gray 1996), with the following objectives<sup>2</sup>:

1. To perform a review of the FSS and assess the effects of deregulation since the Campbell report.
2. To examine major drivers of change in the industry particularly technology.
3. To make recommendations for changes to the existing regulatory framework with view to improving it.

The work of the committee resulted in a set of 115 recommendations which resulted in changes being made to the regulatory framework shown in Table 2.1 and resulting in a more streamlined regulatory framework managed by three main agencies as shown in Table 2.2 (RBA 2000):

Regulatory Authority	Responsibility
The Reserve Bank (RBA)	Monetary policy and financial system stability
Australian Prudential Regulatory Authority (APRA)	All FIs, including ADIs (Building Societies, banks and credit unions), Insurance companies (General and Life), Superannuation funds and Friendly Societies
Australian Securities and Investments Commission (ASIC)	Market oversight and provisions of protecting to consumers from dishonest practices to thereby creating confidence in the financial markets. Also promulgates policy and licenses operators in the Australian Financial Markets.

Table 2.2: Regulatory framework after the Wallis enquiry

Together, these agencies form the Council of Financial Regulators, a body that coordinates and manages the regulatory framework (RBA 2000).

#### 2.4.5 Commercial/Retail Banking Industry

The commercial (transactions primarily for and on behalf of corporations) and retail (deposit taking and credit facilities for the public) banking industry in Australia is a highly competitive and mature industry that is growing at a rate equal to that of the economy in general (Trewin 2000). Deregulation has seen an increase in the number

<sup>2</sup> See also Parliamentary Bills Digest on Parliamentary Library website <http://www.aph.gov.au/library/pubs/bd/1997-98/98bd203.htm#Purpose>

of foreign FIs that have entered the Australian market, however, it continues to be dominated by five domestic FIs that together account for approximately 76% of the market. The commercial/retail banking industry is the third largest industry in the Australian economy contributing 7.6% of GDP. As at 2001, this market was worth nearly AUD\$3,646 billion (US\$1,889 billion) (Trewin 2000).

Commercial/retail banks perform, inter-alia, the following functions (De Lucia and Peters 1998):

- Borrowing and lending via capital markets
- Credit creation
- Depository functions
- Participate in payments and collection systems
  - Real-time Gross Settlement (RTGS)
  - Cheques payments
  - Credit cards
  - Electronic Funds Transfer/Point of Sale (EFT/POS)
  - Preauthorised transfer services
- Internet Banking
- Phone Banking
- Other Services
  - Trust and Nominee services
  - Interest rate and currency futures
  - Options and Share broking
  - Portfolio management
  - Corporate advice
  - Equity and debt underwriting
  - Insurance (Life and General) underwriting

In Australia, banks fall into two categories – local and foreign banks. Local banks tend to dominate domestic retail banking whereas foreign banks have “had substantially more success in funds management, corporate advice, foreign exchange derivatives and corporate banking” (De Lucia and Peters 1998, p39).

#### **2.4.6 Credit Union Industry**

Credit unions comprise the largest single industry, by size, in the Australian FSS. Together, Australian credit unions have a combined asset base of approximately AUD\$24 billion with approximately three and half million members utilising their services. Growth within this sector has continued to be positive and in 2001/2002 credit unions posted a combined growth of 9% (CUSCAL 2002).

A credit union is a mutual organisation that provides an alternative to the traditional retail bank. According to the Australian Credit Union Network, “Credit unions are democratic, member-owned financial institutions that keep total focus on the members they serve” (CUSCAL 2003). Thus, unlike banks credit unions do not have shareholders, rather they have members, who are also their customers. Consequently, the main driver for credit unions is seen to be the service that they provide to their members and not profit, as would be the case in a commercial/retail bank.

Crapp and Skully (1985, p1) provided a more formal definition of credit unions as follows:

*“A democratically controlled voluntary co-operative society of individuals, bound together by a common bond for the pursuit of the economic welfare of members through the receipt of funds from members and other, and the provision of loans and other forms of credit and financial services to members”*

The credit union movement in Australia began post World War II, after the credit union concept was observed in Canada by Australian Royal Air Force personnel and as a direct response to the perception that traditional banks were unresponsive to customer needs (Cooke 1989). According to Lintern (1996), Kevin Yates, a former RAAF service man, is recognised as being the driving force behind the formation of

the first credit union. The first credit union to be registered in Australia is believed to be the Catholic Thrift and Loan Cooperative (later to be known as Universal Credit Union) on 4 October 1946 (Lintern 1996). A unique distinguishing characteristic of credit unions is their adherence to a set of operating principles that form the basis of the credit union philosophy (Long 1966):

1. Open, democratic and voluntary control
2. Non-discrimination
3. Service to members
4. Distribution to members
5. Building financial stability
6. On-going education
7. Co-operation amongst credit unions
8. Social responsibility

Modern Australian credit unions are members of a larger body, Credit Union Services Corporation Australia Limited (CUSCAL), which serves as both an industry body and a service provider to its members. CUSCAL has approximately 181 member unions with a 32.45% share of the market as at the end of 2001 (WOCCU 2001). At an international level, CUSCAL is a member of the World Council Of Credit Unions (WOCCU), a worldwide body that has members and affiliates around the world. With representation in over 90 countries, WOCCU represents 37,000 credit unions and over 112 million members (WOCCU 2003).

Credit unions provide a wide range of products and services including Loans, ATM access, Internet banking services, Credit Card services and Insurance to name a few. In fact, it has been noted that credit unions in Australia have been very innovative in the development of financial products/service and consequently have been noted for being first to introduce many of the services that consumers today often take for granted. Some of these achievements include (Crapp and Skully 1985):

- Free bill payment facilities
- Free payroll deductions facilities

- Free life insurance coverage on credit/borrowings
- First to:
  - Have on-line computer operations
  - Introduce ATMs and POS
  - Introduce internationally linked ATMs and also to provide access to VISA's international worldwide ATM network as the first non United States of America based FIs
  - Offer high interest cheque accounts
  - Offer computer based personal financial planning
  - Introduce home banking

As interest in customer service continues to grow, the issue of service quality gains even more prominence (Duncan and Elliot 2002). Consequently, the future for credit unions as an alternative to commercial/retail banks is strong, if they can continue to remain relevant by providing comparable or better financial services, at lower cost than other FIs. For credit unions this is an area that IT can provide competitive advantage if applied and utilised effectively/efficiently. Based on the foregoing, credit unions were perceived to be an ideal sector for inclusion in this research.

#### **2.4.7 Problems and Challenges**

As a result of deregulation and increased competition, the supply of traditional banking services is no longer the exclusive domain of FIs. According to Llewellyn (1996), FIs are faced with a number of problems and challenges that will drive change in the FSS. Citing evidence from the FSS in the United States of America, Llewellyn (1996) observed the following:

- Increased competition from both traditional and non-traditional FIs
- Increased globalisation
- Entry barriers are falling faster than exit barriers

- Increases in product range through specialisation and unbundling of services. This has the dual effect of also facilitating in the reduction/elimination of entry barriers for potential new entrants
- Asymmetric competition where non-banking firms can provide financial services and yet FIs may not be able to diversify into other markets
- Increased deregulation offering less protection to FIs

Suffice to say the above is not an exhaustive list of all potential challenges faced within and by the FSS, however in the context of this research these points help to illustrate and emphasise the key role that technology can and will play in the continued development of the FSS. As it is, IT enables and facilitates the effective and efficient delivery of existing and new services and ultimately influences the economics of product design and service delivery and on this point alone can be said to have a significant impact on the FSS in general and FIs in particular.

## **2.5 IS in the FSS**

### **2.5.1 Investment In IS**

FIs provide products and services that may be classified into three main categories: a) Taking of deposits, 2) Lending and 3) Services relating to the processing of financial transactions (De Lucia and Peters 1998). Most, if not all, of these products/services are delivered through technology and therefore FIs are significant users of IT. Consequently, FIs are also heavily dependent on industries such as the Information Technology and Telecommunications sectors that supply IT and related services (Trewin 2000). By the beginning of the new millennium, over 80% of all transactions conducted were of an electronic nature and this indicates a significant shift from the traditional 'bricks and mortar' model that relied so much on the existence of bank branches (Points Of Representaion – PORs) and face-to-face contact (Trewin 2000). Thus, most people living in Australia have access to their FIs electronically through a variety of channels including ATMs, EFT/POS, credit cards or the Internet. The sheer volume of electronic transactions conducted by the Australian public is a strong indicator that they have become au fait with and

accepted the use of electronic delivery channels and one might even argue that these have come to be expected as basic services (Trewin 2000).

In their drive to automate, many FIs have closed down parts of their branch networks and laid-off significant numbers of employees (Harker and Zenios 2000a). Thus, the FSS has, to a greater or lesser extent, become a victim of its own success. As an example, many members of the public perceive these branch closures negatively (despite their obvious advantages to the FIs) and consider them to be a massive profit drive by FIs, whom they believe are become increasingly insensitive to the needs of the customer (Thornhill 2003).

In addition, statistics show the use of IT in the finance and insurance industries of Australia was above average in 1997 – 1998. Further, these industries had the highest IT expenses with AUD\$4.7 billion spent on new technology. This equated to approximately 20% of total Australian industry IT expenditure (Trewin 2000).

Financial Institutions have therefore capitalised on the use of IT to increase their products, services and delivery channels. By way of example, some Financial Institutions have substituted labour for capital in the form of flexible and extendable platforms (new investments or improvements to existing systems). As a result they have been able to contain staff and service delivery costs while greatly increasing their ability to service larger numbers of customers and handle significantly higher transaction volumes (Frei et al., 2000; Harker and Zenios, 2000). As new products come onto the market, customers become more sophisticated and demand even more from their financial service providers. Thus, customers themselves have also been instrumental in pushing financial service providers to increase the available range of services by demanding round the clock access to a multitude of financial services and information (Harker and Zenios, 2000).

With this increasing automation, the traditional 'bricks and mortar' concept of banking is rapidly being overtaken by electronic and internet banking via the World Wide Web and other delivery channels all of which require significant investment in technology on the part of the FIs (Joseph and Stone 2003). Justifying such investment(s) is increasingly becoming an issue that senior management have to address (Campbell, 1992). This situation is further complicated by the fact that many

benefits (from IT investment) may not be realised soon after the investment has been made but rather may manifest at a much later stage (Dos Santos, 1991; Weill, 1992). These benefits include a greatly reduced time to market for new products, a wider product portfolio, and better access to customer data by FIs. Yet, despite these (and many more) rather obvious advantages, the problem of being able to quantify and relate the contribution of IS investment to a FIs' performance remains unresolved (Powell, 1992).

Clearly, these issues (and more) contribute to making FIs ideal candidates for research into the relationship between IS investment and organisational performance.

### **2.5.2 Importance and Criticality**

As alluded to in earlier discussions, FIs are by far some of the largest spenders on IS (Section 2.4). These investments have seen many innovations being introduced which in turn have resulted in changes to both distribution and access channels thereby resulting in changes to the way people do their banking (Soteriou and Zenios 1999; Holland and Westwood 2001). As an example, in the past FIs relied primarily on their POR networks, but today FIs are now able to offer customer access to a greater variety of delivery other channels, many of which are IT dependent, in conjunction with the traditional branch network Sievwright (2002). Consequently, there has also been a progressive shift in transaction processing from paper-based through semi-automated to fully electronic which has been facilitated in part by declining costs in both hardware and software that have made investments in IT more affordable and viable (Harker and Zenios 2000a).

Further, investing in IS can have a dual effect (Carrington, et al, 1997). On the one hand, it can create opportunities for competition between existing players in the FSS through improving efficiencies, product diversification, to name a few and on the other it also reduces entry barriers for new entrants in to the market. Technology can also change customer behaviour. As customers become increasingly sophisticated, they demand more products and services to which they demand continuous access 24 hours a day, 7 days a week and 365 days a year (Earl and Khan 2001). Thus, customers also drive FIs to be more innovative in their product development and



delivery. Furthermore, as customer bases grow, FIs are driven to automate processes in order to achieve high levels of efficiency to cope with the increased volumes without necessarily increasing cost bases (Harker and Zenios 2000b).

In addition, dynamism in the FSS encouraged in part by factors such as regulatory changes, new entrants, increasing customer demand for specialised products and other factors means that, more than ever, FIs need to be highly innovative to remain competitive (Horvitz and White 2000). Furthermore, personal experience within the FSS has shown that CEOs have invariably complained that they are spending too much on IS, yet claim that they do not seem to be realising any benefit from these investments. These experiences find strong support in recent observations by Chong (2002). The foregoing may be attributed to a number of reasons, including the difficulty of justifying new investments in IT, technical staff training costs, changes in architecture and even retirement of existing IT in terms that relate to an organisation's performance (Crane and Bodie 1996; Keltner and Finegold 1996; Prasad and Harker 1997; Soteriou and Zenios 1999).

Finally, Harker and Zenios (2000b) define three classes of performance drivers for banks and in all instances, IS plays an increasingly important role:

1. Strategy
2. Strategy execution
3. Environment

Given the foregoing, it is evident that IS investments play a significant role in the FSS in general. These discussions clearly provide strong support for the suitability of the selection of the FSS as an ideal industry in which to investigate the IS investment and organisational performance relationship.

## **2.6 Chapter Summary**

Questions regarding the nature of the relationship between IS investment and organisational performance continue to occupy the minds of researchers and IS professionals alike. These questions revolve around issues of causality,

positive/negative impacts of, and benefits realised from IS investments. To better understand underlying concepts and current wisdom, one naturally turns to the literature for answers. However, the literature on this subject appears to be fraught with inconsistencies regarding the relationship between IS Investment and organisational performance, beginning with the very definition of key concepts right through to the very nature of the relationship itself.

This chapter has endeavoured to address these inconsistencies beginning with a definition of the key concepts (Information Systems, Information Technology and Organisational Performance). In addition, an explanation of the applicability of viewing IS expenditure as an investments was provided as an argument supporting the importance and relevance of this field of research. Further, the issue of the productivity paradox was revisited in the context of the relationship between IS investment and organisational performance.

The FSS was selected as the focal industry for this research for a number of reasons chief of which being that the FSS is one of the largest consumers and users of Information and communication technologies. A Porterian analysis of the FSS identified a number of issues that highlight the use of IS in this sector. In addition, an analysis of the five forces that drive competition in the FSS was also conducted to further illustrate the impact and use of IS. Together, these analyses have facilitated a better understanding of the FSS in Australia and showed that IS does indeed play a key role in this economic sector. Following on from these analyses, was a closer inspection of the two industrial sectors from which the FIs in the sample were drawn, the commercial/retail bank and credit union industries. This was then followed by a detailed discussion of the problems and challenges experienced by the FSS.

Finally, the chapter discussed investment in IS and its importance/criticality within the FSS to further demonstrate the suitability of this economic sector to this research. The emergent picture is of an economic sector that has invested, and continues to invest significantly in IS annually and is heavily reliant on IS not only for its production processes, but also for its end products and services.

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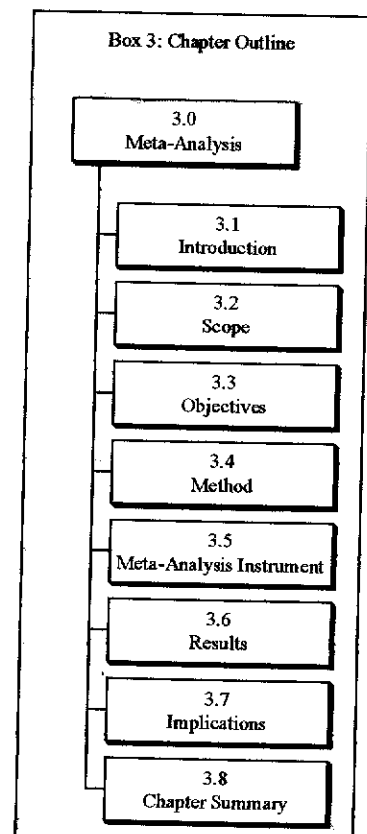
# 3.0 *A Literature Meta-Analysis*

## 3.1 *Introduction*

This chapter reports on a meta-analysis of the literature performed as part the literature review reported in Chapter 2. The meta-analysis was primarily undertaken to develop a clearer understanding of the literature on the business value of IS in general and IS investment and organisational performance in particular as it was noted that there did not appear to have been any such formal, structured meta-analyses to date. Box 3 depicts the outline of this chapter.

Section 3.2 outlines the scope of the meta-analysis of the IS investment and organisational performance literature. This meta-analysis was highly detailed and very comprehensive, spanning a 22-year period from 1980 to 2001 and utilising nine top ranked journals. Section 3.3 presents the objectives of the meta-analysis within the aforementioned scope.

Section 3.4 presents the method utilised to conduct the meta-analysis. This is followed by a description of the research instrument (Section 3.5). The results of the meta-analysis are presented and discussed in Section 3.6, beginning with a discussion of the factors utilised to construct the meta-analysis, followed by the base theories and disciplines, then methodological issues, and lastly a closer look at the relationship between IS investment and organisational performance. After that, the question of variable multiplicity (both dependent and independent variables) is more closely examined. Finally, the meta-analysis



identifies themes surrounding the business value of IS and thus builds a complete picture of the research area. The implications of the meta-analysis are then explored in Section 3.7, followed by a brief chapter summary (Section 3.8).

## **3.2 Scope**

According to Webster and Watson (2002), there are two types of reviews:

1. One in which a mature topic is being dealt with “where an accumulated body of research exists that needs analysis and synthesis” (p.xiv).
2. One in which there are “emerging issues that would benefit from exposure to potential theoretical foundations” (p.xiv).

The meta-analysis reported here falls into the second category. Although there have been reviews focused on other areas in the discipline of IS (Pervan 1994b), this meta-analysis was one of the first known attempts focused primarily at the business value of IS, for example Kohli and Devaraj (2003) recently conducted a meta-analysis of structural variables in the research on the business value of IS. In keeping with other meta-analyses conducted in the past, this meta-analysis is deemed to contribute significantly to the creation of a cumulative tradition of research in IS (Webster and Watson 2002).

## **3.3 Objectives**

This meta-analysis was prompted by the need to better understand the issues around the business value of IS, a conclusion reached after a comprehensive review of the extant literature (Chapter 2) revealed many inconsistencies in the literature. It was also noted there did not appear to have been much effort expended at resolving these inconsistencies to date. This perspective was reinforced and supported by Webster and Watson (2002) who recently observed that there have been very few literature reviews of this type that have been published. Webster and Watson (2002) also

highlighted the fact that literature reviews are an integral part of theory development especially for the IS discipline given its youth.

Thus the objectives of this meta-analysis were:

- To explore the theoretical foundations for research into the relationship between IS investment and organisational performance as an extension to the literature review
- To develop a taxonomy of earlier studies and thus provide insights into the current status of research in this area
- To identify and categorise themes around the business value of IS with a view to identifying directions for future research
- To provide a foundation for further research and debate that may broaden the body of knowledge

### **3.4 Method**

The research method and instrument utilised in the meta-analysis was based on similar research by Alavi and Carlson (1992) and (Pervan 1994b). The use of established methods and tools was a critical design aspect and lends to the credibility of the meta-analysis and its contribution to the body of knowledge.

To perform this meta-analysis, a set of top ranked journals (as at 2001), were selected. These were, European Journal of Information Systems (EJIS), Information and Management (I&M), Information Systems Journal (ISJ), Information Systems Research (ISR), Journal of Information Technology (JIT), Journal of Management Information Systems (JMIS), Journal of Strategic Information Systems (JSIS), MIS Quarterly (MISQ) and Management Science (MS) (Mylonopoulos and Theoharakis 2001). The method utilised to collect data was as follows:

1. Data Collection
  - a. Survey journals and record details
  - b. Identify topic relevant articles by conducting a keyword search

- c. Refine article sample by scanning collected articles
  - d. For each article in the final sample complete a 'Literature Review Data Sheet' (Appendix 1-1)
  - e. Compile data from literature review data sheets
2. Data Analysis
    - a. Analyse data using SPSS v11.5

Once statistical analysis was complete, results were interpreted, including a comparative analysis with the literature (Section 3.6).

### **3.5 Meta-analysis Instrument**

The template for the meta-analysis instrument is shown Appendix 1-1. This instrument was an adaptation, and extension, of an earlier instrument (Pervan 1994b) and had the following components that enabled the capture of variables relating to the data:

Paper/article details: Details of each individual article including *Author(s)*, *Affiliation*, *Journal*, and *Year of publication*. In addition, each article was catalogued utilising an index created from the Journal, Year, Volume and Issue details.

Properties of study: Information relating to *Study Characteristics* (exploratory, explanatory or descriptive), *Stage of theory* (building, testing or extension) and *Epistemology* (positivist, interpretivist or mixed).

Research methods: In all thirteen research methods were identified based on earlier classifications by Galliers (1990), Alavi and Carlson (1992) and Pervan (1994a). These were grouped into two categories, *Empirical* and *Non-Empirical* as shown in Table 3.1.

Empirical	Non-Empirical
Secondary data	Subjective/Argumentative
Field experiment	Reviews
Survey	Action research
Case research	Descriptive/Interpretive
Forecasting	Futures research
Simulation	Role/game playing
Theorem proof	

Table 3.1: Classification of research methods in IS research

Time Scale: Studies were classified depending on whether they were *Cross-sectional* or *Longitudinal*.

Variables: In all 116 *Dependent*, 29 *Control/Intermediate* and 138 *Independent* were identified as having been used in earlier studies. These are listed in Appendix 1-2, Tables A1.3, A1.4 and A1.5 respectively.

Data analysis methods: 34 different *Data analysis methods* (qualitative and quantitative) were identified for coding (Appendix 1-2, Table A1.6).

Research focus: This factor was derived from a study's primary research focus. Although the criteria for inclusion in this meta-analysis was primarily research into the business value of IS, some studies were observed to have wider research parameters. This could and in some cases did influence the research designs employed and ultimately the results obtained, hence the need to explicitly identify this factor.

Link proven: Enabled the identification of the confirmation or otherwise that a relationship between IS investment and organisational performance had been demonstrated in a given study.

Base theory(ies): Enabled the identification of base theory(ies) and/or research disciplines that were utilised in prior research. In all 22 theories were identified for coding (Appendix 1-2, Table A1.1).

**Data sources:** Different studies utilised different data sources depending on the research design employed. This section facilitated the identification of the type of *Data source* used (primary or secondary), the *Industry* in which study was conducted and finally the sample size in each study (Appendix 1-2, Table A1.2).

### **3.6 Results**

The following sub-sections present the results of the data analysis, beginning with a descriptive analysis of the sample that presents the distribution of journals and frequencies of articles in the sample (Section 3.6.1). Section 3.6.2 discusses the base theories and disciplines upon which prior research has been based, followed by an analysis of methodological issues that governed earlier research designs (Section 3.6.3). This is then followed by a closer examination of how earlier research determined the nature of the IS investment and organisational relationship (Section 3.6.4). The focus then shifts to analysing the variables (independent, dependent and control/intermediate) identified in the meta-analysis (Section 3.6.5). Last but not least, Section 3.6.6 presents the themes around the business value of IS as identified in this meta-analysis.

#### **3.6.1 Journal Demographics**

Table 3.2 shows a summary of descriptive statistics of the final sample. The meta-analysis was conducted utilising the set of nine (9) top ranked journals as ranked by Mylonopoulos and Theoharakis (2001). As shall be demonstrated in the following discussions, the meta-analysis was comprehensive and spanned a 22-year period from 1980 to 2001.

As shown in Appendix 1-2 (Table A1.8), published research in this area only appeared after 1989, with total research between 1989 and 1994 constituting 34.9%



of reported research and the majority (65.1%) having only been published in the seven years between 1995 and 2001.

Journal	Total Volumes For Period	Number of Issues for Period	Total Articles Reviewed	Business Value of IS (Total Articles)	Relevant Articles	Frequencies
Journal of Information Technology	16	64	287	24	11	25.6
Information and Management	37	265	773	31	7	16.3
Journal of Strategic Information Systems	10	40	162	8	7	16.3
Information Systems Journal	11	44	174	8	5	11.6
European Journal Of Information Systems	19	54	375	9	4	9.3
Journal of Management Information Systems	18	56	445	19	3	7.0
MIS Quarterly	22	88	432	11	3	7.0
Information Systems Research	12	48	226	13	2	4.7
Management Science	22	264	59*	5	1	2.3
Totals	167	923	2933	128	43	
Percentage			100%	4.36%	1.47%	

Table 3.2: Summary of article counts per Journal

*\*NB: As Management Science covers a very diverse range of topics this count was restricted to IS articles*

Figure 3.1 illustrates the distribution of articles by journal and year for the sample. The distribution of research appears to be fairly uniform over the 12-year period from 1989 to 2001, with interest in this field of research peaking between 1993 and 1996. Analysis of total number of articles per year showed a fluctuating, but

generally increasing trend, suggesting an increase in interest in this field over time (Appendix 1-2, Table A1.9).

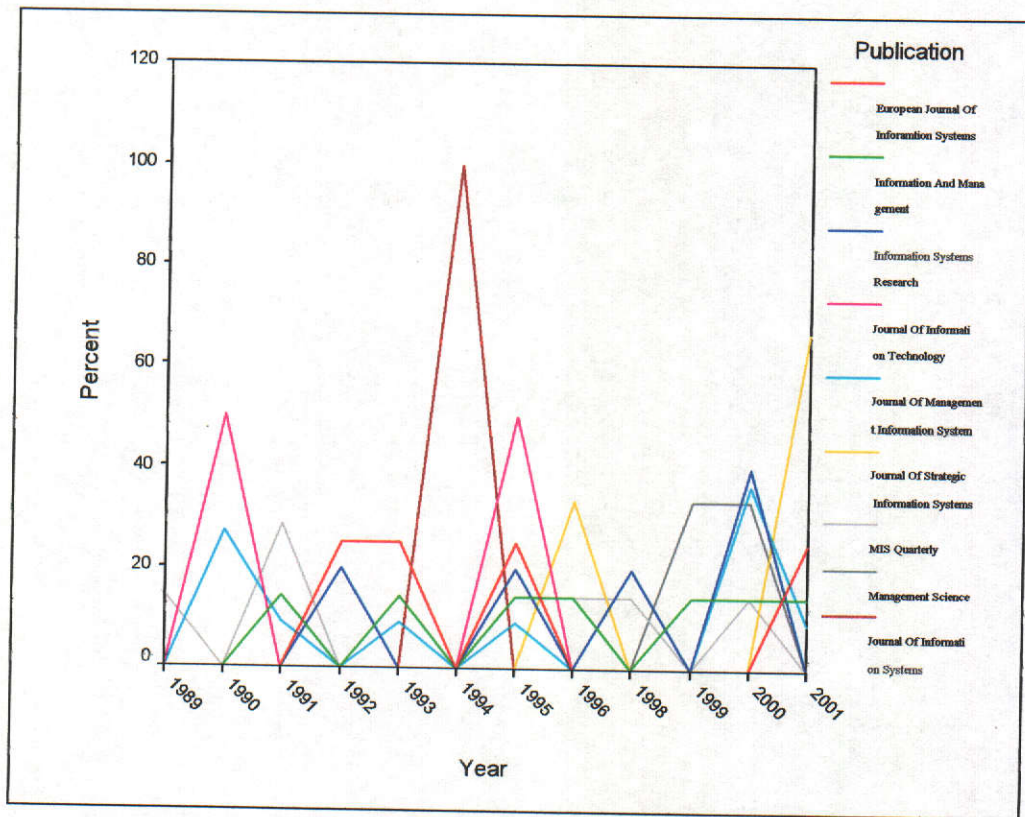


Figure 3.1: Article frequencies in research sample

In all, 167 volumes with a total of 923 issues and 2933 articles were reviewed. A key word search through the 2933 articles yielded a total of 128 articles on the business value of IS as shown in Table 3.2. These articles were subjected to further scrutiny resulting in a reduced set of 58 articles that *explicitly* investigated the relationship between IS investment and organisational performance<sup>3</sup>.

Thus, research on the business value of IS constitutes about 4.36% of total published articles for the sample with research on the actual IS investment and organisational performance relationship constituting 1.47%. This critical observation strongly supports conclusions drawn from the literature review (Chapter 2) on the paucity of research in this field and is in stark contrast to the generally acknowledged

<sup>3</sup> See Bibliography (Chapter 12, Section 12.4).

importance of IS investments as discussed in Chapter 2. Conversely, this observation also provides support for the significance and relevance of the research reported in this thesis. Clearly, more (published) research is required to further strengthen this field of research and to broaden knowledge and understanding in this field.

Turning to the sources of publication, the analysis showed that most research was published in the Journal of Information Technology (25.6%) followed by Information and Management and Journal of Strategic Information Systems (16.3% respectively), with Information Systems Journal in fourth place. Given the fact that the Journal of Information Technology is aimed at publishing “academically robust papers, research, critical reviews and opinions on the organisational, social and management issues associated with significant information-based technologies”<sup>4</sup>, the predominance of articles published in the Journal of Information Technology appears to confirm observations regarding the apparent technological focus of earlier research discussed in Chapter 2.

### **3.6.2 Base Theories And Disciplines**

Culnan and Swanson (1986), and later Lee, Gosain and Im (1999), all contend that the discipline of Information Systems has its foundations in the fields of Computer Science, Management Science and Organisational Science and consequently postulated that the development of IS has subsumed a number of theories and knowledge from these fields.

Issues of structure and theory (and/or lack thereof) in the disciplinary development of the IS discipline were identified as far back as the early 1970’s when the field of MIS was in its infancy. Benbasat and Weber (1996) trace issues regarding the development of MIS from an early article by Dearden (1972, p90) in which he commented that MIS was “embedded in a mish mash of fuzzy thinking and incomprehensible jargon” and concluded that IS research was “now more pluralistic and accommodating of diverse research problems, methods theoretical foundations and paradigms” (Dearden 1972, p91). Many years later, the problem apparently

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<sup>4</sup> See <http://www.palgrave-journals.com/jit/scope.html>

persists, though arguably not quite as severe as when Dearden first made his observations. As Watson (2001, pvii) recently observed:

*“Over the years, as a discipline we have used a variety of theoretical bases from other disciplines and have developed a number of frameworks that classify MIS research.”*

Earlier Lucas (1993) had recognised the import of this issue particularly with reference to research relating to the business value of IS. Thus Lucas (1993) also argued that the growth of IS research in general, and this branch of IS research in particular, owe much of their theoretical development to a variety of disciplines and associated theories as identified in Table 3.3.

Discipline	Theories
Microeconomics	Theory of the firm Production function Efficiency
Economics	Information Economics
Finance/Accounting	Capital asset pricing model Time value of money Determination of interest rates Options theory
Organisation/Behavioural science	Organisational behaviour Cognitive science

Table 3.3: Sample disciplines that have contributed to IS investment and Organisational performance research (adapted (Lucas 1993))

Since Lucas' (1993) original analysis, the depth of theory used in this research has increased and now incorporates theory that is predominantly rooted in the IS discipline (45.1%) as shown in Table 3.4.

Table 3.4 shows a marked increase in the number of base theories and disciplines compared to Lucas' (1993) analysis, an indication of the continuing development of the IS discipline as researchers explore the applicability of theory from other disciplines in an effort to explain observed phenomena within the IS discipline. For the sample, the most frequently used approach to conducting research into the IS investment and organisational relationship was based on the key ratios approach (12.9%) derived from the Accounting discipline, where key ratios are financial ratios based on Key Performance Indicators, such as IS budget, IS expenditure, Total

expenditure, Total revenues (Cron and Sobol 1983; Harris and Katz 1989). These ratios are typically used as input into mathematical models of the IS investment and organisational performance relationship that are typically based on production functions derived from the theory of production (11.3%) in Economics.

Evidence from the literature suggests that most commonly used econometric analysis tool in these studies was the Production function, with most studies utilising the Cobb-Douglas form (Brynjolfsson and Hitt 1996; Gurbaxani, Kraemer and Vitalari 1997), whilst others utilised the alternative CES Trans-log form (Dewan, Michael and Min 1998).

Discipline	Theories	Frequency (%)	Totals (%)
Economics	Theory of the firm	3.2	27.3
	Theory of production	11.3	
	Information economics	4.8	
	Tobin's q	3.2	
	Theory of the consumer	1.6	
	Locus of value	1.6	
	Demand function	1.6	
Finance/ Accounting	Capital asset pricing model	Not used	15.3
	Time value of money	Not used	
	Determination of interest rates	Not used	
	Options theory	1.6	
	Key Ratios Approach	12.9	
Organisation/ Behavioural science	Organisational theory	6.5	9.7
	Cognitive science	Not used	
	Stakeholder Theory	3.2	
Information Systems	Conversion Effectiveness	8.1	32.2
	Miles and Snow Typology	3.2	
	Mcfarlan's Strategic Grid	4.8	
	Business Process Reengineering	1.6	
	Systems Resource Theory	1.6	
	Productivity Paradox	8.1	
	Resource Based View of IS	4.8	
Management	Competitive Advantage (Porter)	11.3	12.9
	Contingency Theory	1.6	
	No base theory	1.6	

Table 3.4: Base theories and disciplines in business value of IS research identified in the meta-analysis

When one considers the characteristics of the general production function and its use in this literature, it is perhaps not surprising that much of the research has produced inconsistent results whose comparability is very low. The literature shows quite clearly that not only have different researchers used different coefficients in

estimating the production function, the very manner in which these coefficients were derived was not consistent. In addition, one key weakness of the production function lies in the difficulty of capturing the effect of intangibles such as context (Brynjolfsson 1996). Further, the general production function assumes causality between the independent and dependent variables. This inherent assumption may have also contributed to the debate into the productivity paradox as prior research has found it difficult to establish causality in this regard (Dewan and Min 1997; Gurbaxani, Melville and Kraemer 2000).

Notwithstanding the seemingly broad theoretical base and progress made over the years, IS research still appears to suffer from a lack of credibility due to what many researchers refer to as an apparent lack of IS based theory (Markus and Soh (1993); Gregor (2002)). Indeed there have been many calls to develop strong and testable IS based theory to address this weakness (Webster and Watson 2002). This meta-analysis clearly supports this call by demonstrating that the majority of theory (64.4%) applied to explain the IS investment and organisational relationship, was in fact derived from other disciplines, particularly Finance/Accounting (14.5%) and Economics (27.3%).

Two conclusions can be drawn from the foregoing:

1. Researchers are addressing the two critical issues of the lack of IS based theory and the need cumulative research traditions in IS research. This is observable in the increased use of IS theory (Table 3.4).
2. There is an increasing level of maturity as demonstrated by the increasing trend in the number of studies per year (Appendix 1-2, Table A1.9)

These results were most encouraging and augur well for the continuing development of research into the relationship between IS investment and organisational performance. However, it is the premise of this thesis that more research is required if this field of IS research is to grow and attain what might be considered to be a critical mass in terms of research. It is therefore suggested that researchers need to focus more on theory building and development as opposed to theory testing in the short term.

### 3.6.3 Method Related Issues

Research design and method have both been identified as issues that may have also affected the comparability and generalisability of earlier research (Kauffman and Weill 1989). Table 3.5 summarises the frequencies and distributions observed in the meta-analysis.

Variable	Factors	Distribution (%)
Epistemology	Positivist	90.7
	Interpretivist	2.3
	Mixed	7.0
Study Characteristics	Exploratory	20.9
	Explanatory	72.1
	Descriptive	7
Stage of theory	Building	16.3
	Testing	60.5
	Extension	23.3

Table 3.5: Design issues in business value of IS research

As can be seen in Table 3.5, the meta-analysis showed that the majority of studies, 90.7%, were based on the positivist paradigm and in keeping with the positivist paradigm, most studies undertaken were explanatory (72.1%) where the primary goal was to test theory (60.5%). In contrast, only 16.3% of the research was aimed at theory building, consistent with discussions in Section 3.6.2 regarding the need to broaden the theoretical foundations of this field of study. Further, a breakdown of data sources by industry showed that the majority of studies (53.5%) were cross-sectoral and utilised secondary data sources. Studies focused at individual industrial sectors appeared to be evenly distributed, Manufacturing 9.3%, Banking and Finance 7.0%, Health 7.0% (Fast Food and Engineering both 2.3%). For the sample, the organisation was found to be the most commonly used unit of analysis. Despite the foregoing similarities in data sources, inherent differences in research designs relating to time-period, data analysis methods and other factors still complicate possible comparison with between studies.

Cross tabulation of industry and year revealed no significant variation in the industries researched over time with the exception of those studies conducted in the cross-sectoral category which, although they showed fluctuations in frequency, still indicated an increase in the number of studies over time. On the other hand a cross

tabulation of industry and data source indicated minimal use of mixed data sources (7.9%) compared to 60.5% for secondary data sources and 31.6% for primary data sources.

### *Data Analysis Methods*

In total, 34 different data analysis methods (predominantly quantitative) were identified during coding (Appendix 1-2, Table A1.6). However, apart from two methods, Correlation analysis (16.7%) and Linear regression (15.2%), there was little variation in the use of these methods across the sample. Thus, the meta-analysis confirmed the lack of consistency in the use of data analysis methods, an issue that has been cited, not only as a key weakness in the literature, but as one that may also be amongst the main causes of the lack of generalisability of previous studies (Kauffman and Weill 1989).

The need to extend the research into the IS investment and organisational performance relationship and build theory has already been established (Section 3.6.2). To achieve this however, researchers may need to utilise a broader spectrum of methods and not solely rely on those based on the positivist-quantitative perspective. This objective may be achieved by conducting more research that is of an exploratory nature to first build the knowledge base.

Finally, the meta-analysis clearly showed that there have not been any studies that have utilised a combination of methodologies and thus provides strong support to the calls in the literature for the use of pluralist approaches to enhance research in the discipline of IS in general and the use of the pluralistic approach in this research in particular (Mingers 2001).

Suffice to say, the meta-analysis enabled the identification of weaknesses in earlier research regarding the issue of research method(s). In so doing, the meta-analysis not only facilitated the development of a robust research design, it also enabled the selection of the most appropriate research methods for this design (Chapters 5 and 6).



### **3.6.4 IS Investment and Organisational Performance Relationship**

One of the most topical issues in the literature is the nature of the actual relationship between IS investment and organisational performance. Arguments around the nature of this relationship have ranged, on a continuum, from no relationship at all through mixed results to positive and direct relationships (Bender 1986; Harris and Katz 1991; Weill 1992; Brynjolfsson and Hitt 1998). These different perspectives were captured in the meta-analysis with surprising results. Using the aforementioned continuum, it was noted that the majority (62.8%) showed a positive relationship between IS investment and organisational performance. Of these, 25.6% showed a direct relationship and in 37.2% the relationship was deemed to exist but indirect. The indirect nature of this relationship was later confirmed, for a sample of FIs drawn from the Australian FSS through the application of both case and survey research in the development and testing of the conceptual model (Chapters 7, 8 and 9). Unfortunately, causality was not established, though certainly inferred, from the studies showing a direct relationship.

The results were surprising in that many researchers have often stated that a primary reason for conducting such research was the equivocal nature of prior research. Indeed this may also have contributed to debate around the productivity paradox (Brynjolfsson 1993). Yet from a meta-analytical perspective, it appeared that this may not be the case and evidence suggested that a predominantly positive relationship exists between IS investment and organisational performance.

### **3.6.5 Variables**

In keeping with the diverse research designs employed, research into the relationship between IS investment and organisational performance employed a wide range of variables. In all 116 dependent variables, 29 control/intermediate variables and 138 independent variables were identified (Appendix 1-2, Tables A1.3 – A1.5).

***Independent Variables***

Table 3.6 summarises the frequencies of the most cited independent variables. Of the 138 independent variables identified (Appendix 1-2, Table A1.5), the most cited variables only constitute 25.9%, a result that clearly shows that prior research has suffered from the aforementioned inconsistency in variable use discussed earlier and shown by the low frequencies in Table 3.6.

<b>Independent Variables</b>	<b>Frequency(%)</b>
Non-IT Capital	4.4
IT Capital	4.4
IT Labour	3.3
IT staff costs/IT Budget	2.8
IT training costs/IT budget	2.2
IS expense	2.2
IT Budget/Revenue	2.2
IT asset value/revenue	2.2
PCs or terminals per employee	2.2

Table 3.6: Frequency of independent variables

As can be seen in Table 3.6, Capital related variables (both non-IT and IT) have the highest frequency, in keeping with the trend observed in many organisations where capital has been utilised as a substitute for labour in an effort to reduce total operating costs in the wake of declining IT unit costs (Gurbaxani, Melville and Kraemer 2000). Further, the results in Table 3.6 confirm observations that much of prior research has utilised ratios derived from IS related variables (approximately 55% of variables in Table 3.6) as independent variables which researchers have tried to relate to organisational performance in an effort to explain this relationship (Cron and Sobol 1983; Harris and Katz 1989).

***Dependent Variables***

116 dependent variables were identified in the meta-analysis (Appendix 1-2, Table A1.3). Table 3.7 summarises the most frequently cited dependent variables in the sample (where frequency was greater than 4%). The variables in Table 3.7 are typical examples based primarily on financial Key Performance Indicators that are utilised extensively in Accounting to measure/depict organisational performance (Bazley et al. 1993).

Dependent Variables	Frequency(%)
Growth in Revenue	8.4
Return On Assets	5.8
Return On Sales	5.2
Sales Growth	4.5

Table 3.7: Most frequently cited dependent variables

Most notably, the use of these variables in the research designs only constituted 23.9% of total variables identified by the meta-analysis. These results therefore indisputably confirmed the inconsistencies in variable use identified in the literature review (Chapter 2).

Apart from financial indicators, the meta-analysis also identified some technology related variables that have been utilised in prior research. Table 3.8 summarises the frequency of these technology related dependent variables. However, the use of these variables amounted to only 2.4% for the sample.

Dependent Variables	Frequency(%)
IT capital	0.6
Value of new technology projects	0.6
PC per employee	0.6
IT expense	0.6

Table 3.8: Frequency of technology related dependent variables

The very low frequencies of technology related dependent variables confirmed observations that such variables may not have been considered appropriate measures of organisational performance (dependent variables).

Significantly, the meta-analysis showed that there did not appear to be any dependent variables utilised to measure the effect of IS investment on the internal aspects of organisational performance.

### Control/Intermediate Variables

The meta-analysis identified 29 control/intermediate variables that may influence the IS investment and organisational performance relationship (Appendix 1-2, Table A1.4). Of these, the most frequently cited variables were organisational size as determined by the number of Full Time Equivalent staff (6.5%) and environmental uncertainty (6.5%).

The emphasis on environmental uncertainty in prior research suggests that some researchers may have recognised the impact of context on the IS investment and organisational relationship (Mckeen and Smith 1993a). However, it should be noted that context is not a single variable and therefore it is argued that prior research would have benefited from a closer examination of what actually constitutes context and how this may have influence the IS investment and organisational relationship (Trauth 2001). Unlike earlier research, this research explores this issue in detail.

Thus, the multiplicity of variables identified in the preceding sub-sections confirmed the complexity of conducting research into the IS investment and organisational performance relationship and supported assertions in the literature as to the difficulty of cross study comparisons (Kauffman and Weill 1989). The implications of these observations to research were clear:

- Researchers need to develop a system of classification for variables that would create a more manageable set of variables.
- Such a set would lead to a more consistent approach in research design and method
- In addition, this would contribute to a better comparability and generalisability of results.

In summary therefore, the results relating to the dependent variables support the use of financial performance indicators in measuring the external performance. Further, these results also identify the lack of suitable performance indicators that could be used to depict the internal performance of an organisation, particularly with respect to IS. Furthermore, the issue of context and its impact on IS investment is one that requires more detailed examination as it may have very important ramifications for the IS investment and organisational performance relationship.

Finally, the meta-analysis served the very important purpose of identifying the multiple and diverse variables used in the literature. This issue is of concern to researchers as it paints a rather disjointed picture of research in this field and points to the apparent lack of a strong foundation for a cumulative tradition of research.

### 3.6.6 Themes in IS Investment Literature

One of the objectives of the meta-analysis was to identify themes and directions for future research into the IS investment and organisational performance relationship that would facilitate the development of this field of IS and thus improve researchers and IS professionals understanding of this very important relationship. Figure 3.2 illustrates the identified themes.

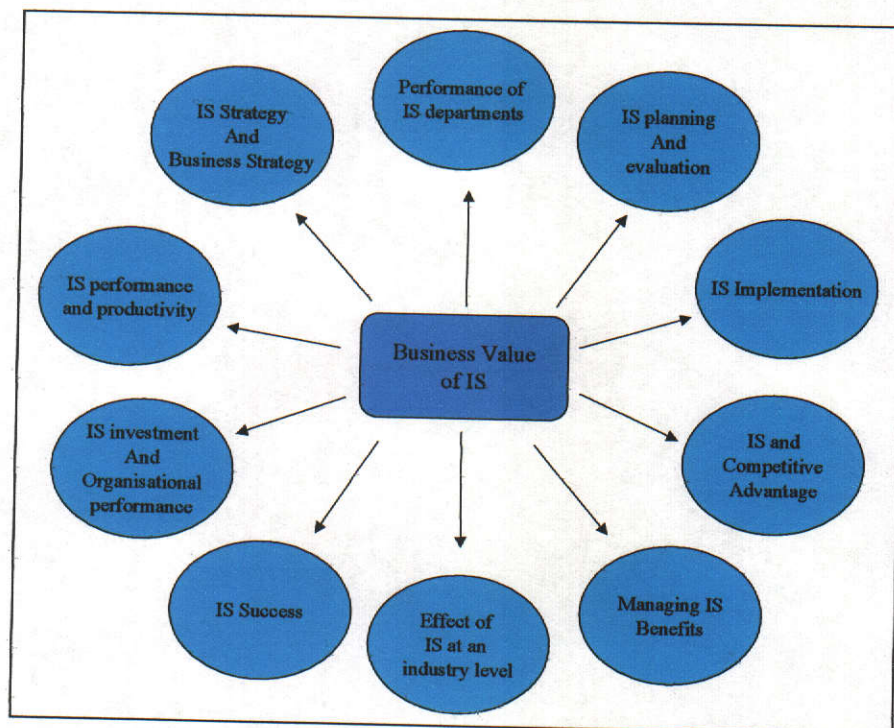


Figure 3.2: Themes and concepts around the business value of IS

The nomenclature for each theme was derived from categories in IS research based primarily on the Barki classification system (Barki, Rivard and Talbot 1988).

The following is a discussion of each theme and some of the literature it encompasses.

#### Information Systems Strategy and Business Strategy

Research in this theme has been primarily concerned with the use of IS within a particular industry such as manufacturing, the financial services sector (Kremar and Lucas Jr. (1991), Weill (1992)) or has been cross sectoral as illustrated by studies

such as King and Sabherwal (1992). Other researchers such as Lee and Adams (1990) went on to consider the strategic potential of IS for an organisation. Lee and Adams (1990) discussed the use and applicability of a variety of models to the analysis and determination of the strategic potential of IS with the aim of developing a simple but effective framework for evaluating/analysing diverse competitive models based a number of criteria. Some of the frameworks discussed include Business Systems Planning (IBM); Ives and Learmonth's (1984) Customer Resource Life Cycle (CRLC); Porter and Millar (1985)'s Information Intensity matrix; Rockart's (1982) Critical Success Factors (CSFs); Wiseman and Macmillan (1984)'s Strategic Thrust-Strategic Target matrix and Mcfarlan (1984)'s framework. Another area of interest in this theme is the alignment of IS strategy with business strategy to achieve organisational objectives (Palmer and Markus 2000). In much of this research, the unit of analysis was the organisation.

### *IS Performance and Productivity*

At a much more micro level, research has focused on investigating the performance effects of technology itself. However, as noted by Banker and Kauffman (1988) it is not always easy to ascribe the performance effects of specific technologies within an organisation although this has been a critical design issue in many studies where attempts have been made to isolate and determine the contribution of a specific IT to performance (Floyd and Wooldridge 1990). Examples of such studies and the technologies investigated include, Panko (1991) – office productivity; Floyd and Wooldridge (1990) – Automated Teller Machines; and Banker, Kauffman and Morey (1990) – Point of Sale Systems.

### *Performance of IS Departments*

In an effort to understand the business value of IS, other researchers have looked at the performance of IS departments, with the unit of analysis being the IS department itself. Arguably understanding how an IS department is run may provide insights into

how well IS contributes to organisational performance based on the premise that successful IS departments contribute to overall success of the organisation.

Miller and Doyle (1987) investigated the effectiveness of IS departments in 21 South African organisations using a composite instrument developed from Bailey and Pearson's (1983) and Alloway and Quillard's (1981) research instruments. Using factor analysis, the authors identified seven performance factors for IS departments (which they also mapped onto Rockart's (1982) Critical Success Factors). Later studies such as Slevin, Stieman and Boone (1991) also used the concept of CSFs as a framework for developing performance measures, tracking IS performance and as an enhancing device for IS functions. In a later study, Miller (1993) reported that by focussing on specific areas, IS departments could improve their service delivery and hence their contribution to organisational performance. It is evident that the inherent assumption behind most of the research under this theme was that improvements in the organisation's IS function would lead to better organisational performance. Other examples of studies on this theme include Singleton, Mclean and Altman (1988), Slevin, Stieman and Boone (1991), Saunders and Jones (1992).

#### *Effect of IS at an Industry Level*

Whereas some studies have focused on specific technologies and others on IS departments, some researchers have attempted to develop an understanding of the impact of technology investments at an industry level (Doll (1989), Menon, Lee and Eldenburg (2000), Andersen (2001)). Doll (1989) considered potential impacts of IS on the airline travel services industry with particular emphasis on the use of IS as a competitive tool. Menon, Lee and Eldenburg (2000) analysed the effect of IS in the Healthcare industry using a longitudinal sample (1976 – 1994) by applying the Cobb-Douglas production function to labour and capital (medical, IT and medical IT) and their results led to the conclusion that IS contributes positively to organisational performance in the Healthcare industry.

Palmer and Markus (2000) investigated the effect of a suite of technologies called the Quick Response (QR) Program aimed at improving performance in the retail industry (fashion, food, speciality items, entertainment products). In that study, the authors

utilised a single shot, cross sectional research design and statistical data analysis. Contrary to Menon, Lee and Eldenburg (2000)'s Healthcare study, Palmer and Markus (2000) did not find significant support for the use of QR in the retail industry, thus suggesting that investment in a particular technology may not have any impact at an industry level (for the retail industry). These results were similar to those obtained by Sager (1988) for the banking industry.

Andersen (2001) argued that IS has the potential to improve communication, decision-making and therefore performance of organisations in different industrial settings. Utilising Internet and Intranet technologies as the focal technologies, Andersen (2001) concluded that in dynamic/complex environments both Intranet use (combined with autonomous decision-making) led to improved organisational performance and the use of the Internet (combined with participatory decision making) led to higher innovation. On the other hand, in less complex industries, Internet use was associated positively with higher productivity and Intranet use with higher innovation.

### *IS and Competitive Advantage*

Some researchers have suggested that information (and hence IS) may change the way organisations compete (McFarlan 1984). Thus, King, Grover and Hufnagel (1989) investigated the idea of using *Information* as opposed to *Information Technology* for competitive advantage.

Sager (1988) investigated the effects of the introduction of ATM technology on the banking industry in Australia and concluded that there were no "dramatic examples of sustainable competitive advantage" (p67). On the other hand, Boon (1988) surveyed published cases on IT and competitive advantage and concluded that, for some organisations, greater utilisation of IT may result from a better understanding of the strategic impact of IT. This was also in keeping with results obtained by Mckeen and Smith (1993) who found that utilisation was a factor in the IS investment and organisational performance relationship. Research into this theme has predominantly focussed on the organisation as the unit of analysis.



### *IS Planning and Evaluation*

Dealing with technological advances has been and continues to be a key facet of IS management but it is not always easy to demonstrate economic benefit (Tam (1992), Davern and Kauffman (2000), Dos Santos (1991)). Further, IS investments may not always be a matter of choice in some industries where certain IS investments may be needed to comply with changes to, or the existing requirements of, statutory regulation. Thus, among the many problems that new technologies present, one of the first, and an extremely important, problem that an IS manager must deal with is an economic one: should the firm invest in a project involving new technology?

Dos Santos (1991) strongly argued that traditional capital budgeting approaches do not adequately answer this question. On the other hand, Tam (1992) called for more formal and consistent methods for selecting and ranking projects and suggested capital budgeting as a solution. Tam (1992) also commented on the effect of power and politics on IS/IT evaluation.

Davern and Kauffman (2000) further suggested the need to consider IT value both ex ante (project selection) and ex post (project implementation) as a mechanism for improving IS planning and evaluation process.

### *IS Investment and Organisational Performance*

Studies performed in this field of research have, at best, had equivocal results for a variety of factors (Dewan and Kraemer (2000), Bharadwaj (2000), Thatcher and Oliver (2001)).

Weill and Olson (1989) investigated the IS investment and organisational performance relationship through a series of mini case studies across different sectors of the economy. They found that the lack of clear and concise definitions of IS and IT could lead to inconsistent results, thus affecting the determination of this relationship and how it was measured. Problems with determining Return On Investment from IS were again confirmed and it was also noted that most organisations that did use ROI were not comfortable with this method and lastly that organisational issues, in that study, did play an important role in the relationship.

Thus Weill and Olson (1989) concurred with other researchers, such as Ballantine, Galliers and Stray (1996) and Renkema and Berghout (1997), on the need to define and track IS investment more accurately, as ROI calculations and other capital budgeting techniques, are not ideally suited to IT investments evaluation resulting in a recommendation that different measures be used for different types of IT investment. In addition, Weill and Olson (1989) also noted the pressing need to cater for contextual issues in the investment/performance relationship.

Similarly, Mahmood and Mann (1993, p104) observed that earlier studies had “failed to address two fundamental issues that are essential to this type of research: (1) adoption of a conceptual framework to define IT investment and organisational performance and, (2) identification of relevant and accurate measures to operationalise these concepts.” Mahmood and Mann (1993) concluded that IS investment is related (positively) to organisational performance, but cautioned that it was not the sole contributing factor.

Tam (1998) studied the problem in four newly industrialised Asian countries Malaysia, Hong Kong, Singapore and Taiwan, with considerable effort expended to duplicate earlier studies in the United States of America to develop a basis for comparison. Tam (1998) found that, IT investments were not correlated with shareholder return, that there was little evidence to suggest that the level of IT investment was valued by the (stock) market and that there were no consistent measures of what constitutes IT investment.

Dewan, Michael and Min (1998) took a slightly different perspective and considered the characteristics of the relationship between IS investment and organisational performance and found that IS investment was positively related with diversification. Jurison (1996) also suggested a different approach to considering the benefits of IS investment by suggesting a stakeholder value based model.

Alpar and Moshe (1990) used a micro-economic approach, based on a cost function, to estimate the value (and contribution) of IS investments to organisational performance and concluded that the use DCF methods may not be suitable to understanding the IS investment and performance relationship.

It is therefore evident that more work is required to bring congruence to this field of research. Despite the seemingly different results obtained, researchers are increasing concurring on the importance of the IS investment and organisational performance relationship.

### *IS Success*

Perhaps one of the more difficult constructs to operationalise, IS success has been considered an important theme in IS management literature (Ballantine et al. 1996). It has also been used as a proxy for User Satisfaction (Seddon 1997; Skok, Kophamel and Richardson 2001). Logically, it is difficult to fault the argument that 'successful IS leads to improved organisational performance' and this has in fact been a recurrent thread in the literature. Thus, DeLone and McLean (1992) identified six dimensions of IS success; system quality, information quality, use (later extended as perceived usefulness (Seddon 1997)), user satisfaction, individual impact and organisational impact which constitute the IS success construct.

Tan and Lo (1990), using a modified version of the Bailey and Pearson (1983) instrument found eight dimensions that constitute IS success; systems security, information product and service quality, user knowledge and involvement, user attitude to support staff, user interface, system utility, integration of system and senior management support.

Clearly more work is required to bring congruence to the research. Despite the seemingly different results obtained, researchers agree that understanding IS success is important due to the ubiquitous nature of IS investments in contemporary organisations.

### *Managing Benefits*

Silk (1990) identified three generic benefits of IS investment (Efficiency, Effectiveness and Strategic/competitive advantage) and suggested that IS investment

is but one of the many resources that organisations can utilise to improve performance.

The foregoing argument is in keeping with propositions by Barney (1991) relating to the Resource Based View of the firm, Robbins (1987) on Organisational theory and Freeman (1984) on Stakeholder theory. The implications of Resource Based View and Stakeholder theories to this research are explored in more detail in Chapter 4.

The foregoing therefore suggests that organisations access and utilise a variety of resources that may be classified into distinct categories, *Financial Capital*, *Human Capital*, *Physical Capital* and *Organisational Capital* (Barney 1997). Thus, the importance of managing benefits becomes clear and by attaining the generic benefits, organisations become more proficient at providing products and services demanded by their customers.

### *IS Implementation*

Kydd and Jones (1989) discussed the implementation of shared information technologies such as e-mail and their potential impact on organisational productivity. Two important observations were made with respect to IS implementation:

- The economic benefits of such systems are more difficult to quantify compared to other systems such as transactional systems.
- The importance of culture as a determinant to the success or failure of IS investments should not be underestimated.

The first observation brings us back to the original objective of research into the business value of IS, being the need to demonstrate the contribution of IS to organisational performance. Intuitively and logically, both researchers and IS professionals agree on this contribution, as substantiated in this meta-analysis, yet the issue of causality remains unresolved.

### **3.7 Implications**

Two important conclusions were drawn from this meta-analysis. First the meta-analysis provided strong evidence that, although researchers are addressing issues of the lack of IS based theory and cumulative research traditions in IS research, much more work is required to strengthen this base. Second the results suggest a modicum of growth and maturity within this field of IS research and are therefore most encouraging and augur well for the continuing development of this field of IS research. It is recommended that more research be conducted if this field of IS research is to grow as the meta-analysis clearly highlighted the paucity of prior research in this area. In addition, it is also suggested that researchers should focus more on theory building and development as opposed to theory testing in the short term to shore up the theoretical foundations.

A key observation was made that between 1980 and 2001, research in to the business value of IS only constituted 4.36% (only 1.47% for the IS investment and organisational performance relationship) of published IS articles in the major IS journals as surveyed in this meta-analysis. This observation provides strong support for the need to conduct further research in this field of IS.

Further, the meta-analysis clearly showed that, apart from two exceptions, there was little consistency in the use of analytical methods. In addition, analysis confirmed the dominance of explanatory type research based on the positivist paradigm that utilised quantitative approaches to theory testing at the expense of theory building in a field that is still developing. This observation was particularly important as it supported one of the key arguments for this research. In addition, the meta-analysis also demonstrated that, for the sample, none of the studies utilised a pluralist approach to theory building. The pluralist approach is one that is gaining in prominence within the field of IS in general and its adoption in this research adds to the uniqueness of this research and its anticipated contribution to knowledge (Mingers 2001).

In addition, the multiplicity of variables identified by the meta-analysis suggests that more research is required to refine the variable set, which may in turn produce more comparable results. This may be achieved through the use and application of consistent research designs. A secondary benefit of the foregoing would be the use

and application of a more consistent set of analytical tools leading to more consistent and comparable results.

Whilst great care was taken to define a clear set of parameters for the meta-analysis, as with all research of this nature, it was difficult to be precise in the organisation and categorisation of previous studies as some studies may fit neatly into one area whilst others may tend to loosely fit more than one category. There is a need therefore for further research to more clearly define the themes around the business value of IS in order to more clearly focus continuing research in this area. In addition, a more clearly defined set of variables would facilitate the reduction of the large set identified in this meta-analysis into a much more manageable set and hence lead to better research designs that would yield results that are more comparable.

### **3.8 Chapter Summary**

The meta-analysis reported in this chapter was conducted to better understand the literature on the business value of IS in general and the IS investment and organisational performance relationship in particular. This meta-analysis was conducted using a set of variables identified from previous literature and was therefore grounded in the literature. Using the meta-analysis, 27 base theories were identified as having been used to investigate and test the relationship between IS investment and organisational performance.

Further, the meta-analysis identified and confirmed the use of multiple and different variables (independent, dependent and control/intermediate variables), a factor that has contributed to the aforementioned inconsistencies observed in the literature. Despite this, the foregoing issues may also be considered a positive indication that research in this field is still in the developmental stage and that more research will lead to a convergence in the use of variables and methods. This optimism is driven in part by the identification of a number of themes around the business value of IS that may form the foundation upon which researchers may be able to create knowledge and thus enhance understanding of this relationship.

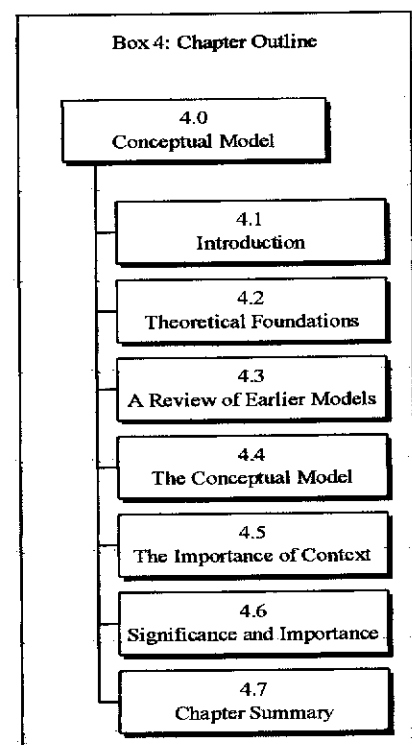
# 4.0 Conceptual Model

## 4.1 Introduction

This chapter presents the proposed conceptual model, examines its theoretical foundations and presents arguments for its significance and importance as shown in the Box 4.

Section 4.2 presents three key theoretical perspectives: (1) Resource Based View of the firm theory, (2) Stakeholder theory and (3) General Systems Theory including arguments regarding their relevance and applicability to the development and interpretation of the conceptual model.

Section 4.3 presents a chronological review of earlier models. This review clearly demonstrates the evolution of this field of research, its key influences and ends with a summary of the weaknesses of existing models as a prelude to demonstrating the significance and importance of this research and its resultant conceptual model.



Having thus set the scene, the discussion then turns to the actual conceptual model upon which this research is based (Section 4.4). The various components of the conceptual model are presented and discussed in terms of their relevance, significance, interaction and relationships. Section 4.5 discusses the issue of context and its importance to research in IS in general and the relationship between IS investment and organisational performance in particular. Last, but by no means least, the chapter reviews the significance and importance of this research and the conceptual model (Section 4.6). The chapter concludes with a summary of preceding discussions.

## **4.2 Theoretical Foundations**

The following sub-sections presents three key theoretical perspectives utilised not only in the construction and development of the conceptual model, but also in the analysis and interpretation of data collected during the research. These theories are:

1. The Resource Based View (RBV) of the firm theory
2. Stakeholder theory of the organisation
3. General Systems Theory

General Systems Theory was utilised primarily as the framework upon which to construct the model as it enabled the definition of the scope and the potential inter-relationship between the components within the defined scope (Wang 2004). The Resource Based View of the firm and Stakeholder theories on the other hand were primarily utilised as interpretive lenses through which the model could be analysed and in so doing facilitated the explication of the IS investment and organisational performance relationship. It should be noted that there is a great deal of support in the literature for the application of these theories in general, with RBV and Stakeholder theories being applied either individually (Mikko 1991; Vital and Aubert 2002; Bharadwaj 2000) or in combination (Idris et al. 2003). In addition, apart from explicitly considering RBV and Stakeholder theories, this research does benefit from research in other disciplines, such as Management Science and Organisational Science, as discussed in Chapters 2 and 3.

### **4.2.1 A Resource Based View of IS Investments**

Barney (1997) asserts that the *Resource Based View of the Firm* (RBV) stems from two fundamental assumptions:

1. *Heterogeneity of resources* – Organisations use resources for production and the availability of these resources within and across organisations is non-homogenous.



2. *Immobility of resources* – Depending on availability, resources may be subject to supply inelasticity, may be expensive to acquire, may be difficult to duplicate or any combination of these three limitations.

Thus, organisations have access to a variety of resources classified into distinct categories, *Financial Capital, Human Capital, Physical Capital* and *Organisational Capital* that they utilise to provide products and services to customers (Barney 1997).

It can therefore be deduced that RBV theory provides a sound and logical platform for understanding how organisations acquire and deploy resources to achieve set objectives (Bharadwaj 2000). RBV theory therefore provides an excellent basis for constructing and interpreting the proposed conceptual model. To illustrate, first consider the assumption of heterogeneity of resources and how it may be applied to the acquisition and use of IS investments in FIs. It is generally accepted that FIs will invest in IS to gain competitive advantage (Lee and Adams 1990). It may therefore be argued that no two FIs will have identical resource structures and therefore no two IT portfolios will be identical, *even though they may have similar Information Technologies*. An excellent example is provided by the credit union industry in Australia where most credit unions utilise the same core processing system provided by CUSCAL, yet have clearly different IT portfolios. Further, the proposed conceptual model enfolds the concept of resource heterogeneity by incorporating the various categories of resources defined in the RBV theory as follows:

- Financial and Physical Capital – IT portfolio component
- Human Capital – Managerial effectiveness and Considerations for Strategic Information Systems Planning components
- Organisational Capital – Organisation performance component

Similarly, the second premise relating to immobility of resources is also incorporated into the model. To construct their resource groups, FIs will search their environment for the 'best' and 'most appropriate' resources in all the categories of capital listed above (Ramani and Pavri 1994; Harker and Zenios 2000a). The rarer these resources are, the more strategic their function becomes and the more immobile these resources are, the greater the competitive advantage to the firm. To summarise, Barney (1991) argued that a firm's resources contribute to its profitability if they are:

- a) Valuable – resources must have the capacity to improve profitability. Resources that achieve this become valuable to the firm.
- b) Rare – the rarer resources are, the higher the demand in the market. This therefore means that a firm that can acquire such resources will have an advantage.
- c) Inimitable – refers to the difficulty of duplication of resources. This characteristic combined with the rarity and value of resources can greatly contribute to their strategic potential.
- d) Hard to substitute – Like inimitability, the more difficult resources are to substitute, the stronger the competitive advantage they provide to a firm.

The applicability of RBV theory to IS resources is clearly self-evident (Bharadwaj 2000). Thus, the fundamental assumptions of RBV theory are without a doubt applicable to IS resources and the four characteristics can (and have been) demonstrably applied to IS resources (Rex 1999; Bharadwaj 2000). As a cautionary note however, although IS resources may provide a measure of competitive advantage, this form of competitive advantage is difficult to sustain in the long term, as IS resources are not perfectly immobile (Willcocks, Feeny and Islei 1997).

#### **4.2.2 Stakeholder Theory of the Organisation**

It is worth noting that interest in Stakeholder theory has been growing of late and much of this growth has been driven, to a greater or lesser extent, by the increasing need to understand and measure organisational performance. This is an issue that the conceptual model in this research attempts to address (Donaldson and Preston 1995; Rowley 1998; D'Souza and Williams 2000; Jawahar and Mclaughlin 2001). Freeman (1984) is credited with postulating the framework upon which modern Stakeholder theory is based. Utilising a stakeholder map Freeman (1984) provided a graphical model with which organisations could identify the bi-directional impacts and interactions between an organisation and its stakeholders similar to the illustration in Figure 4.1. Thus, Stakeholder theory has, as its central theme, the existence of relationships between multiple individuals/groups, the stakeholders, and the

organisation where a stakeholder is defined as “any group or individual who can affect or is affected by the achievement of an organisation’s objectives ” (Freeman 1984, p46).

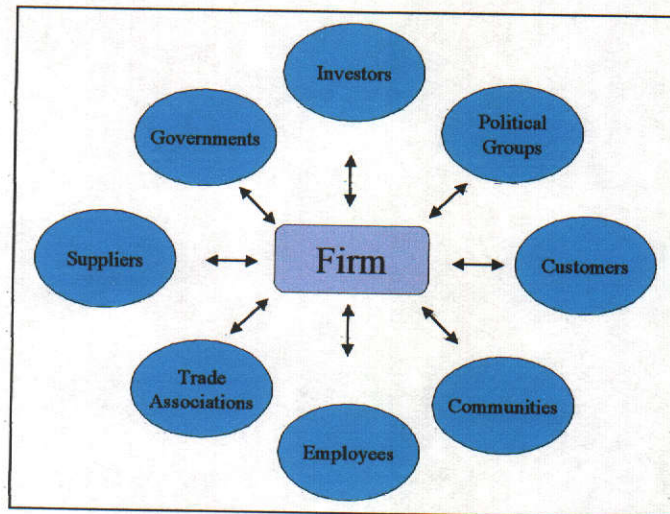


Figure 4.1: Typical Stakeholder map for a firm (Source: (Donaldson and Preston 1995))

Further, stakeholders have been classified either as primary (direct) and secondary (indirect) and include, but are not limited to, customers, employees, communities, and investors (Figure 4.1). Since Freeman's (1984) early work, researchers have proffered many (sometimes divergent) interpretations of Stakeholder theory that have been classified into descriptive/empirical, instrumental and normative categories (Trevino and Weaver 1999). These interpretations have been put forward in response to what have been identified as shortcomings in the original framework and in an effort to improve upon that framework (Donaldson and Preston 1995; Key 1999). Key (1999) identified these shortcomings as including, but not limited to, poor contiguity between internal and external variables, insufficient explanation of process, a lack of appropriate definitions of levels of analysis and lack of broad contextual assessment.

Despite these criticisms, much research has been undertaken to substantiate the Stakeholder theory (Donaldson 1999; D'Souza and Williams 2000). Further, this theory has been successfully applied in IS research (Jurison 1996; Griffin 1998). Consequently, this theory was deemed a relevant and appropriate foundation for the conceptual model as it identifies and defines many of the complex interactions between an organisation and its stakeholders.

### **4.2.3 General Systems Theory**

According to Wang (2004), *systems thinking* is a characteristic of knowledge that originated in early human history, although General Systems Theory is a fairly recent theory that dates only as far back as the 1950s when it was first proposed by the biologist von Bertalanffy. From this early work on General Systems Theory have emerged several perspectives based on the two divergent dichotomies of mechanistic/non-living (closed-loop) systems and organic/living (open-loop) systems (Felix 2003).

According to Wang (2004, p395), General Systems Theory is based on the fundamental assumption of *nonsummativity* that states that “the whole is greater than the sum of its parts” as opposed to *elementarism* in which the whole “is the sum of its individual parts”. It is this assumption of nonsummativity that enables a system, be it a collective of technology, processes or an organisation(s) to be viewed as single entity or black box with its own set of objectives that it attempts to achieve as efficiently and effectively as possible. This characteristic has enabled General Systems Theory to be utilised effectively in the development and design of models in diverse fields of knowledge.

Thus, systems thinking in general, and General Systems Theory in particular, provides an excellent framework for developing a conceptual model of the IS investment and organisational performance relationship as it provides for the critical definition of both the scope of and the interactions between components within the conceptual model (Mayfield, Mayfield and Lunce 2003).

### **4.2.4 Précis**

Resource Based View theory and Stakeholder theory of the organisation have each been tested extensively (separately and in combination) and both have strong grounding and support in the literature (Key 1999; D'Souza and Williams 2000; Bharadwaj 2000; Vital and Aubert 2002). This research therefore utilises this body of knowledge by integrating these two theories and General Systems Theory together with observations from the literature on the relationship between IS investment and

organisational performance as presented in Chapters 2 and 3 to develop and test a conceptual model that endeavours to explain this very important relationship. Although this is a novel approach for this field of IS research, it should be emphasised that integrating Resource Based View theory and Stakeholder theory is an acceptable approach to conducting research and one that was used recently in the development of a management excellence model in Malaysia (Idris et al. 2003).

### **4.3 A Review of Earlier Models**

This thesis proposes a model that is grounded in the literature in order to develop a better understanding of the relationship between IS investment and organisational performance. The conceptual model suggests the existence of a relationship between the level of investment in IS, as depicted by the IT portfolio and organisational performance (Markus and Soh 1993). At this stage however, the conceptual model does not in any way suggest causality between IS investment and organisational performance.

To illustrate the derivation and development of the conceptual model, consider early models of IS investment and organisational performance. Beginning with a simple cause and effect model and using the organisation as the unit of analysis (Mckeen and Smith 1993b), it has been be argued that IS investment leads to better organisational performance as shown in Figure 4.2.

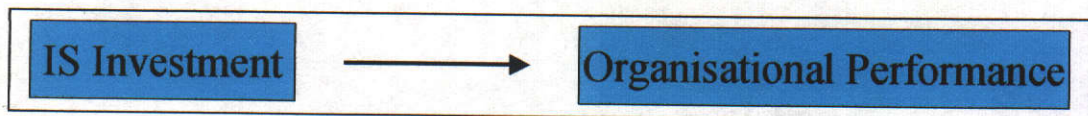


Figure 4.2: A simple cause and effect view of the IS investment and organisational performance relationship

This simple model (derived from General Systems Theory) forms the foundation upon which many of the models in the literature are built (Mayfield, Mayfield and Lunce 2003). However, the model in Figure 4.2 though intuitive, is simplistic and fails to take into account the effect of factors such as the role of management, the environment and the fact that organisational performance has both an internal and an

external aspect (Chapter 2). In addition, the simple model in Figure 4.2 assumes that all IS investments are the same, yet organisations invest in different types of technologies and (over time) build a portfolio of these technologies that together constitute their total technological capability (Kauffman and Weill 1989). Lastly the model is open-ended and does not in anyway depict the secondary (feedback) relationship between organisational performance and IS investment as suggested by General Systems Theory with respect to mechanistic/non-living systems (Wang 2004).

Based on the foregoing, the following sub-sections identify and discuss those models in the literature that are perceived to have influenced the development of the conceptual model in this research.

### 4.3.1 Lucas Model

Lucas (1975a) and Lucas (1975b) reported on early attempts to develop an understanding of the business value of IS.

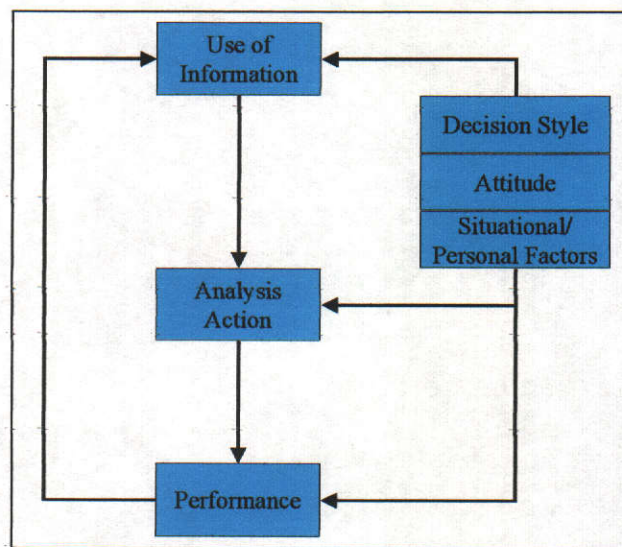


Figure 4.3: An early model of the IS investment and organisational performance relationship (Lucas 1975b)

Using a research design that focussed on the study of sales personnel and their use of an Accounting Information System, Lucas (1975a) concluded that although the results supported the relationship in general, the environment of the organisation

tended to influence specific aspects making the relationship complex and difficult to model.

In later research, this model was refined and revised as shown in Figure 4.4 with the focus shifting from *use* to *IT expenditure*, with 'use' becoming an intermediary variable.

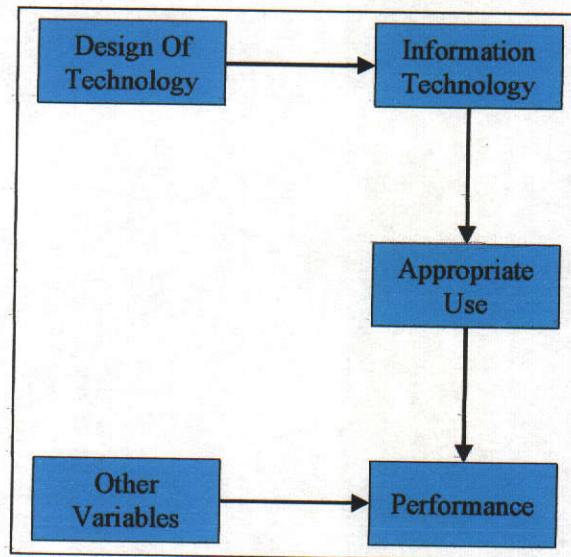


Figure 4.4: A revised model of IS investment and organisational performance (Lucas 1993)

In addition, Lucas (1993) suggested that the level of analysis could depend on the research design and therefore could be any of the following, the economy, an industry, a group of organisations or a single organisation, part of an organisation, a group or even an individual. This revised model (Figure 4.4) also took into account the issue of context in the form of 'other variables', though these were not explicitly defined, with Lucas (1993) preferring to suggest instead that this definition be left to the researcher and the research design employed, an approach that has been adopted by other researchers (Chapter 2).

### 4.3.2 Trice and Treacy Model

From the simple model of the early seventies, Trice and Treacy (1986) suggested a broader perspective and thus the idea of *utilisation* as the link between the two major components. Trice and Treacy (1986) specifically identified IT budgets, personnel

and IT efficiency, as the contextual variables that could possibly influence the IS investment and organisational performance relationship as shown in Figure 4.5.

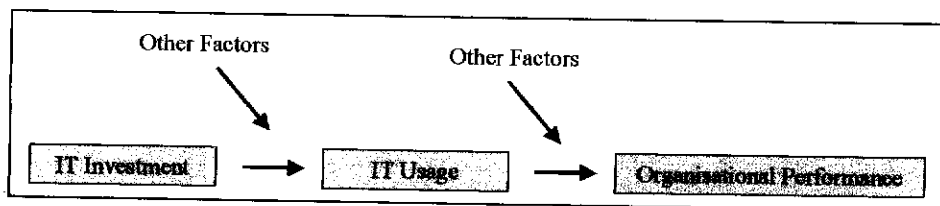


Figure 4.5: An expanded view of IS investment and organisational performance (Trice and Treacy 1986)

Thus, Trice and Treacy (1986, p237) observed that utilisation alone was “not sufficient to predict performance” and consequently could not ascribe causality in the above relationship because “constructing a continuous theoretical path from Information Technology through utilisation to performance may still be difficult” (p238), primarily due to the difficulty of operationalising the utilisation variable.

### 4.3.3 Weill Model

Weill (1992) investigated the IS investment and organisational performance relationship in the manufacturing sector. The resultant model is illustrated in Figure 4.6 and had the following notable features:

1. Explicit consideration of the possible effects of time lags between cycles of IS investment.
2. Classification of IS investment into separate categories.
3. Explicit consideration of the role of management in the IS investment process.

By considering the effect of time lags, Weill (1992) noted that many of the benefits from IS investments were not immediate due to the organisational learning process that must be undergone each time new technology is introduced. Other studies have also suggested the need to consider the effects of time lags and the impact of learning and growth (Brynjolfsson 1993; Devaraj and Kohli 2000).



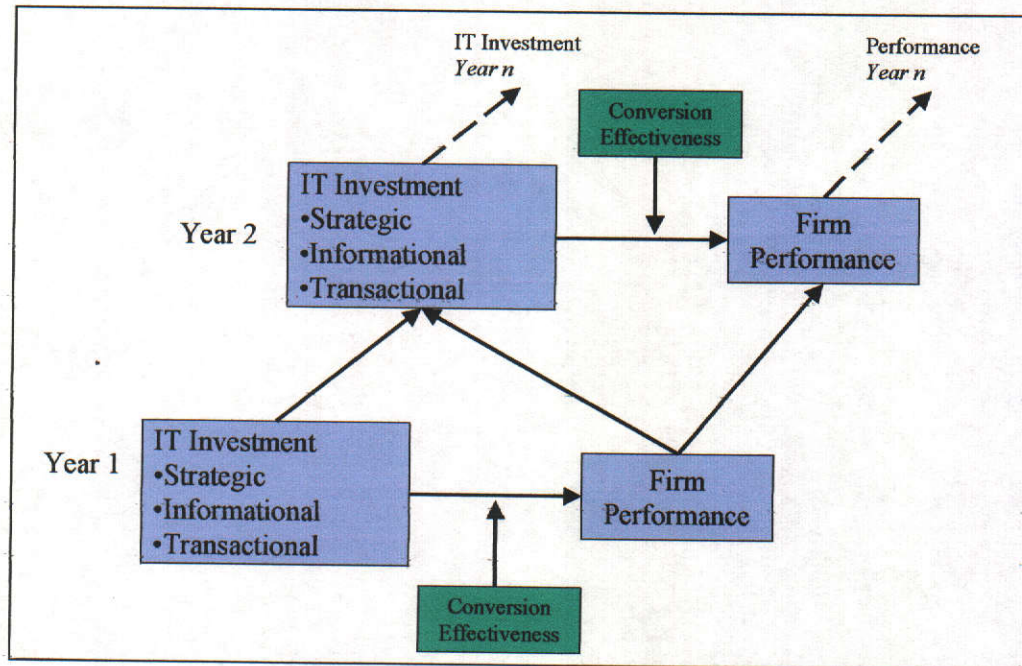


Figure 4.6: Relationship between IS investment and organisational performance  
(Source: Weill (1992))

Thus, single-shot, cross-sectional studies conducted in the past may have erroneously reported a lack of (positive) impact on performance by IS investments. Further, by classifying IS investment into different categories, Weill (1992) made the important observation that not all IS investment is the same and hence the resultant impacts on performance are likely to be different. Weill (1992) clearly demonstrated this aspect and noted that transactional IT appeared to contribute more to performance than the other two categories. In effect, this observation confirmed that management needed to be aware of those IT investments that are likely to have more significant impacts on performance when making IS investment decisions. In this regard, Weill (1992) investigated the effect of a variable termed *Conversion effectiveness* which, it was argued, captured the role and impact of management on IS investment decisions. Consequently, Weill (1992) argued that even when two or more organisations invested in the same technology, they were not likely to obtain identical results. This observation was in keeping with RBV theory (Section 4.2).

#### **4.3.4 Mckeen and Smith Model**

Mckeen and Smith (1993) tested Trice and Treacy's (1986) model and concluded that "there is a strong linear relationship between IT investment and IT usage" (p625). Their study and its result, though encouraging, had limited generalisability due to a number of weaknesses, most notable being the fact that the study was based on a specific technology (main frames). In addition, the model was open-ended and did not suggest any form of secondary interaction (feedback) between organisational performance and IT investment.

The issue of a secondary relationship is one that many models, including Lucas (1975a), Lucas (1975b), Markus and Soh (1993) and Trice and Treacy (1986), but excluding Weill (1992) appear to have failed to take into consideration. It is argued here that the secondary relationship between organisational performance and IS investment is necessary as it not only completes the investment cycle, but brings into consideration the question of time. Further, this secondary relationship ushers in the possibility that not all IS investments deliver benefits within a given investment cycle and that some of the benefits may only be enjoyed at a later date. It was partly for this reason that Kauffman and Weill (1989) and Brynjolfsson and Hitt (1996) argued that cross sectional studies into the relationship between IS investment and organisational performance may not have truly captured the performance effects of IS investments. These weaknesses in earlier models were recognised and the conceptual model developed in this research attempts to overcome them by specifically incorporating a secondary relationship that effectively completes the model.

Like Weill (1992), Mckeen and Smith (1993a) also observed that even when two organisations expend equivalent amounts on IS, the resultant performance effects were different. This observation provides two very important arguments for the conceptual model. The first relates to the appropriateness of utilising RBV theory as described in Section 4.2 and the second the necessity of considering the role of management in the IS investment and organisational performance relationship.

In addition, Mckeen and Smith (1993a) also observed that more successful (profitable) organisations tended to invest more in IT than those that were less

successful (profitable). Harris and Katz (1988) made similar observations a few years earlier and later concluded that higher IS expenditures do not necessarily result in higher IS cost structures (Harris and Katz 1991).

#### **4.3.5 Markus and Soh Model**

Utilising a model where the dependent variable was Firm profitability (ratio of operating profit to operating revenues) and the independent variables were Current IT expenditure, Application portfolio size, Proportion of IT services outsourced and incorporating other variables (size and diversity of banking activities), Markus and Soh (1993), found that not all organisations achieved financial returns from their (current) IS investments. In this regard, Markus and Soh (1993) also noted that structural variables could strongly influence the relationship between IS investment and organisational performance.

Further, Markus and Soh (1993) observed that in some cases the possible lack of benefits realisation from IS investment may have been due to the effect of time lags (up-to 10 years) between the investment and realisation of benefits. Furthermore, Markus and Soh (1993) strongly argued that the role of management, as depicted by Conversion effectiveness strongly influenced how IS were utilised and had a consequent effect on performance. Thus, even though this study was not able to show a positive relationship between IS investment and organisational performance, it is still instructive in its deductions relating to the IS investment and organisational performance relationship and the implications for management with respect to IS investment.

It is evident from the foregoing discussions, that many of the earlier models had distinct weaknesses, as illustrated by the exemplars discussed in the preceding subsections, which foreshadowed their ability to effectively model the relationship between IS investment and organisational performance. These weaknesses confirm the pressing need to develop models that are better able to explain this relationship.

### **4.3.6 Summary of Weaknesses in Earlier Models**

Based on the general discussions regarding the literature (Chapter 2) and the foregoing review of key models, the following weaknesses were identified (Kauffman and Weill 1989; Trauth 2001):

- Single linear open ended relationship with no secondary relationship
- Lack of generalisability
- Lack of comparability
- Focus on a single technology
- Focus primarily on external performance, without considering internal performance issues
- Role of management not explicitly considered
- Effect of Context not explicitly considered
- Inconsistent and incomplete definitions of core concepts, such as IS and IT
- Little research conducted in the FSS, with most research being conducted primarily in one region of the world, the United States of America.

The conceptual model attempts to improve understanding of the IS investment and organisational performance relationship by addressing these weaknesses and simultaneously consolidating the strengths of earlier models.

Having thus reviewed some key models from the IS investment and organisational performance literature, the discussion now turns to a detailed description of the individual components of the conceptual model and their inter-relationships.

## **4.4 The Conceptual Model**

Based on the preceding discussions, a conceptual model was proposed that endeavours to address the shortcomings identified in earlier models. This conceptual model was strongly grounded in the literature and has the following characteristics:

- Derived from earlier research into the IS investment and organisational performance relationship, including the models reviewed in Section 4.3
- Has a strong theoretical foundation as it incorporates theories that have been tested extensively in the literature:
  - Resource based view of the firm theory (Bharadwaj 2000; Idris et al. 2003; Mckeen and Smith 1993b; Vital and Aubert 2002)
  - Stakeholder theory (Freeman 1984; Brenner and Cochran 1991; Donaldson and Preston 1995; D'Souza and Williams 2000; Jawahar and Mclaughlin 2001)
  - General Systems Theory (Frandsberg 1999; Felix 2003; Mayfield, Mayfield and Lunce 2003; Wang 2004)
- Incorporates research on IS and organisational performance in financial institutions (Markus and Soh 1993; Harker and Zenios 2000b)
- Incorporates research on the role of management in the organisation (Weill, 1989)
- Combines variance and process models to enhance its explanative power (Seddon 1997)
- Utilises a comprehensive literature review that draws from a number of disciplines including, but not limited to, Information Systems – investment, performance and strategy, Economics – theory of production, Organisational science – organisational behaviour and learning, and Management – Finance and Accounting (Lee, Gosain and Im 1999).

The conceptual model has four components linked together in a combined process and variance model (Figure 4.7):

1. Level of IS investment as represented by the IT portfolio and consisting of Infrastructure, Transaction Processing Systems (TPS) and Management Information Systems/Decision Support systems (MIS/DSS).
2. Organisational performance (internal and external).
3. Managerial effectiveness.

4. Considerations for Strategic Information Systems Planning (SISP).

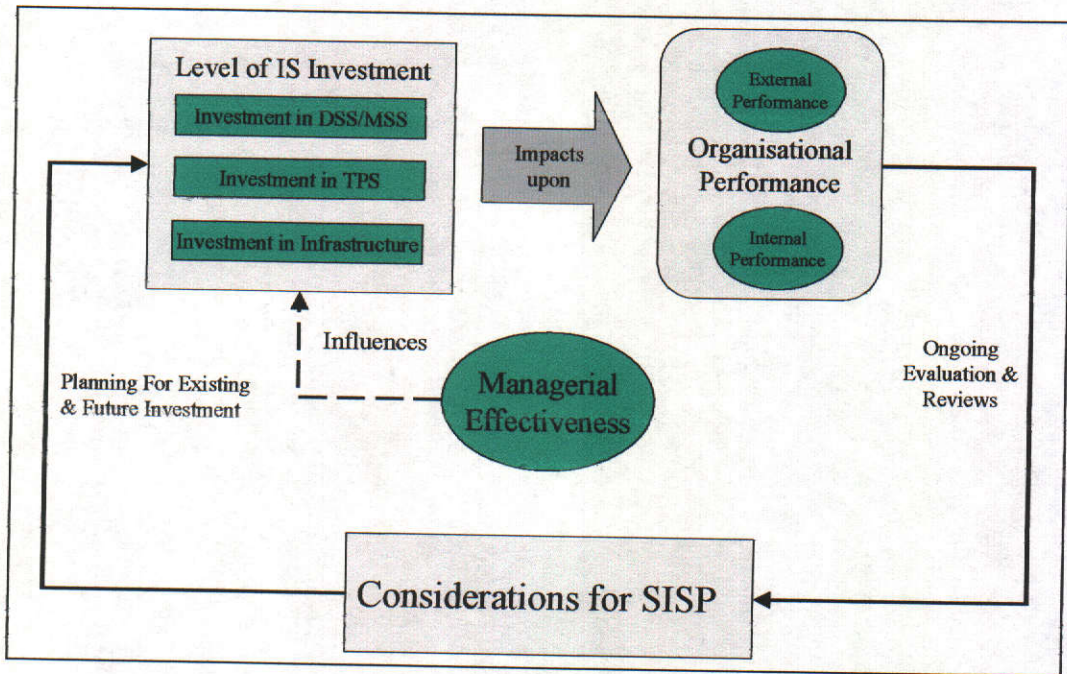


Figure 4.7: Conceptual model of the relationship between IS investment and organisational performance

These components will now be discussed (sub-sections 4.4.1 – 4.4.4).

**4.4.1 Level of Investment – IT portfolio**

Traditionally, Information Technology has been used to reduce costs in organisations by automating organisational processes. This role has changed over the years and Information System now encompass a much greater scope than simply achieving processing efficiencies, including, communication, e-mail, Office Automation/Groupware, MIS/DSS, Expert Systems to name a few (Ward, Griffiths and Whitmore 1990; Hammer and Champy 1993; Sohal and Ng 1998; Harker and Zenios 2000b). Ward et al. (1990) discussed the evolution of IS in terms of three eras, namely the Data Processing (DP) era with its emphasis on efficiency, the Management Information Systems (MIS) era, with its emphasis on effectiveness and more recently the Strategic Information Systems (SIS) era, with its emphasis on competitiveness. Although, Ward et al (1990) accepted that this is a very simplified manner of viewing the evolution of IS, they still argued that it is certainly a convenient model and one that has often been used as an instructional tool in

providing an overview of the development of IS. Willcocks and Lester (1999) also presented a similar model for understanding the development of IT.

As alluded to earlier, one of the shortcomings of many of the earlier studies has been the focus on a particular technology, thereby limiting the scope in terms of understanding the impact of other technologies on organisational performance. Earlier, Bender (1986) argued that whilst attempts to understand the impact of individual technologies on performance were laudable, it was more beneficial to consider the sum total effect of all IT on performance. Invariably this has meant that previous studies could in fact have underestimated the actual impact of Information Systems on organisational performance (Weill and Olson, 1989). To overcome this constraint, the conceptual model incorporates an IT portfolio that consists of three-tiers of technology: 1) Infrastructure, 2) Transaction Processing Systems (TPS) and 3) Management Information Systems/Decision Support Systems (MIS/DSS) as illustrated in Figure 4.8.

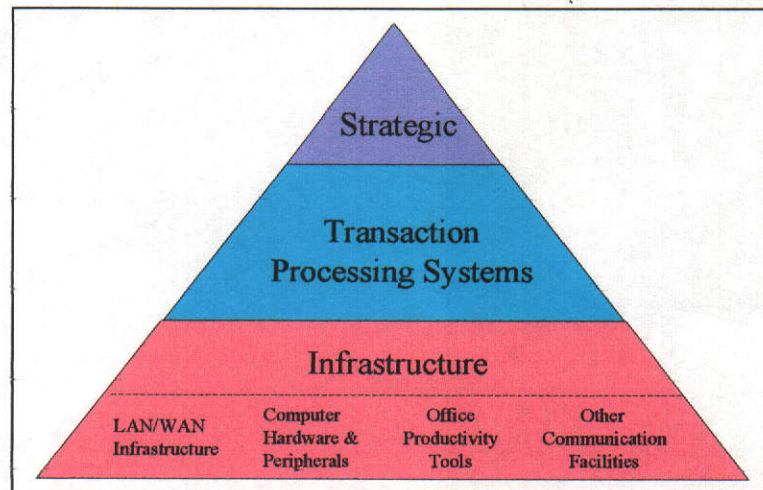


Figure 4.8: An Information Technology portfolio

Weill (1992) proposed a similar classification where the systems in the IT portfolio were defined in terms of their *management objectives*. It was one of first attempts at investigating the IS investment and organisational performance relationship from a holistic perspective and in many ways, that classification has helped foster a clearer understanding of the contribution of each component. Thus, the three tiers are defined as follows (see also McKeown (2001)):

### Infrastructure

Infrastructure forms the basic building blocks for the organisation's architecture and therefore provides the technological platform/foundation (Weill and Broadbent, 1998). Infrastructure represents the *minimum* IT that may be required by an organisation to function (Byrd and Turner 2001). Therefore, it is not usual (although possible) for organisations to differentiate themselves at this level, as infrastructure on its own may not provide any competitive advantage. In addition, expenditure relating to infrastructure is typically more difficult to justify, compared to the other two tiers (Robson 1997).

### Transaction Processing Systems

Transaction Processing Systems (TPS) are systems that provide a mechanism for organisations to process and record the daily activities between their customers and themselves, based on a set of predefined rules (McKeown 2001). Usually these involve the automation of simple but highly repetitive processes thus enabling organisations to handle large volumes on a daily basis. For a system to fit in this category, it must meet the following criteria (McKeown 2001):

- TPS can be *batch*, *online* or *real time* depending on the nature of the application and usually form the 'core' upon which many operations depend. Hence the alternative name of Core Processing Systems.
- TPS enable the organisation to collect data, mainly, at the operational level. It uses predefined rules to enable users to verify the accuracy and completeness of data. This data is processed and reports are generated on a regular basis for users to scrutinise and take appropriate action. Data is stored securely in a database.
- Information output from TPS can be used as input to higher-level systems such MIS/DSS. Depending on the level of integration between these two tiers, this transfer could be dynamic or alternatively require some form of intervention by systems administrators/users.



Thus, TPS are typically used to automate processes and substitute capital for labour thereby saving costs (Weill 1992).

*Management Information Systems/ Decision Support Systems*

Systems in this category are designed to provide summary information that facilitates faster decision-making thus resulting in some form of competitive advantage. Systems in this tier vary but are all designed to assist management to recognise problems, generate alternatives and then make appropriate decisions aimed at resolving the identified problems (McKeown 2001).

In summary therefore, to achieve maximum efficiency and effectiveness, the three tiers should be as closely integrated as possible with each layer being dependent on the preceding layer. Either one or more of the systems in the three tiers may be classified as *Strategic Information Systems* (SIS), depending on an organisation's perspective as to the relative importance and criticality of those systems (Robson 1997; Pearlson and Saunders 2004). Laudon and Laudon (1998, p49) provide an excellent definition of a Strategic Information System as follows:

*"Strategic information systems change the goals, business processes, products, services or environmental relationships of organisations to help them gain an edge over competitors."*

Thus, the idea of a SIS relates more to the business objectives of an organisation as opposed to the technical specification of any given system (Frenzel 1992). This is in keeping with RBV theory as discussed earlier in this Chapter. Clearly for any system(s) to be considered strategic, it must create and provide some form of sustainable competitive advantage. To achieve this, SIS must meet at least one of the following criteria (Willcocks, Feeny and Islei 1997; Pearlson and Saunders 2004):

- The system(s) must provide customers with significant value through the products and services offered to such an extent that it would cost them to change service providers. In so doing the strategic system *increases switching costs*. This is particularly true for many customers, as the consequences of

switching banking/financial service providers need to be carefully analysed and understood before any such prospect is undertaken.

- Most organisations implement strategic systems to gain competitive advantage and in the process they (whether by design or not) attempt to *raise entry barriers to new entrants*. However, the cost of Information Technology today is such that this may no longer be as crucial as it may have been in the past.
- Strategic Information Systems must enable organisations to provide additional services over and above what may have been offered in the past. In so doing, organisations can broaden their product/service base and thus *change the nature of competition* within their markets. Further, organisations could use their strategic systems to carve out niche markets for themselves.

Thus, the conceptual model recognises the fact that different types of IT may have differing effects on the performance of an organisation. It is therefore argued that this aspect makes the conceptual model intrinsically stronger in its ability to depict and facilitate the interpretation of the relationship between IS investment and organisational performance in comparison to earlier models.

#### **4.4.2 Organisational Performance**

The second component of the conceptual model is organisational performance, which the conceptual model depicts as having two aspects, an internal and external aspect. One of the strengths of this conceptual model is that it does take into consideration the fact that IS investment does not only affect external (financial) performance but also affects the internal 'health' of an organisation (Raymond, Pare and Bergeron 1995; Sircar, Turnbow and Bordoloi 2000). However, modelling this component is never easy, as Dos Santos (1991) observed, the organisational performance impacts of IS tend to be long term and are often indirect, subtle, complex and multiple. Secondly, IS investment is not the only item that affects organisational performance as there are many other issues that could impact on performance (Cron and Sobol 1983; Hitt and Brynjolfsson 1996; Harker and Zenios 2000b).

Considering Stakeholder theory and the multiplicity of stakeholders, it follows that different stakeholders will have different perspectives of what constitutes 'good' organisational performance and consequently will have differing views of what they consider to be the most appropriate indicators of performance (Freeman 1984; Key 1999). This implies that any number of performance indicators could ostensibly be used to report on performance.

Although it is generally accepted that most industries have commonly accepted sets of performance indicators that are used, not only for performance reporting, but also for benchmarking purposes, it is clear that the diversity of performance indicators as evidenced by the results of meta-analysis in Chapter 3, could be problematic for this field of research. Further, it does make benchmarking and comparison of organisational performance between FIs difficult (Palmer and Markus 2000). The caveat is that even where such indicators are used, there may still be a need to normalise them in order to ensure that they all reflect the same value. An example of such is found in 'depreciation' where different rates of depreciation may be applied which then affects the 'value' of IS assets reported. This in turn affects any performance ratios or indicators that incorporate this item, such as Return On Assets (ROA). The FSS is not immune to these measurement problems (Campbell 1992) and Stakeholder theory therefore provides some interesting insights and a probable explanation as to why this diversity exists (Freeman 1984; Key 1999).

The organisational performance component of the conceptual model therefore aims to identify those Key Performance Indicators (KPIs) that may best be related to IS investment and thus engender a better understanding of this relationship (Kohli and Devaraj 2003). As a starting point, the conceptual model identifies five KPIs based on current literature, Share price (for publicly listed FIs), Net Interest Income, Non-Interest income, Operating Expense, and Credit quality (Campbell 1992; Carrington, Llanguth and Steiner 1997).

#### **4.4.3 Strategic Planning for Information Systems (SISP)**

In keeping with General Systems Theory, the conceptual model (Figure 4.7) depicts a 'feedback loop' that, in essence, forms a secondary relationship which completes

the IS investment cycle. In the conceptual model, this component is comprised of the factors that are considered during the course of SISP as they influence, and to a certain extent control, succeeding IS investment decisions. Consequently, the presence of this secondary relationship also brings into account the issue of time lags and the impact of benefits from previous IS investment cycles (Weill 1992). It is therefore argued that as SISP is conducted at the commencement of (or even during) an investment cycle the benefits from the previous investment cycle are realised and incorporated into the new cycle through the considerations for SISP (Pearlson and Saunders 2004). The effects of time lags on IS investment are well understood and accepted in the literature and hence this feature of the conceptual model significantly enhances its explanative power with respect to the IS investment and organisational performance relationship (Brynjolfsson 1993; Devaraj and Kohli 2000).

Thus, a review of the literature identified nine factors, or 'considerations' relating to SISP that senior management are likely to consider (Weill and Olson 1989; Earl 1993):

1. Definition of IS
2. Tracking of IS investments
3. Factors influencing investment decisions regarding IS
4. Originators of IS initiatives
5. Calculation of return on IS investments
6. Alignment of IS investment with Corporate strategy/goals
7. IS for competitive advantage
8. Efficient/Effective utilisation of IS resources by organisation
9. Development of policies for IS (Architectures, technologies etc)

Clearly, none of these considerations stands alone and all are interlinked (Ward and Peppard 2002). The following is a detailed explanation of each these factors and their importance to SISP.

### *Definition of IS*

As demonstrated in Chapter 2, the definitions of IS and IT continue to be problematic with the terms being used interchangeably. By seeking to properly define and understand the two concepts, management tasked with IS strategy formulation will have a better grasp of the prevailing situation and thus generate more explicit and accurate alternatives during IS strategy formulation resulting in better IS investment decisions (Li and Ye 1999).

### *Tracking IS Investments*

For IS investments to be utilised effectively and efficiently, the tracking of said IS investments assumes a critical role (Hirscheim and Smithson 1999). However, observations in both practice and theory appear to indicate that in some cases, particularly where there is no formal SISP or a suitable planning framework, the tracking of IS investments is not an a priori consideration. As a result, the true cost and benefits from IS investments are at best under-estimated at worst perceived not to exist (Renkema and Berghout 1997). The conceptual model emphasises the need for this activity, as part of the SISP process to enhance the benefits realisation process and effectively govern IS investments.

### *Factors Influencing IS Investment Decisions*

It is accepted that there are a lot of factors that influence IS investment decisions (Kremar and Lucas 1991; King and Sabherwal 1992). These factors cover the broad spectrum of activities that an organisation undertakes. Taking such factors into account in the SISP process fosters better decision making and facilitates more appropriate use of IS resources in the organisation (Weill and Olson 1989). It should be noted that the conceptual model does not seek to elaborate on these factors, but rather to confirm that management are aware of the existence of germane factors that may influence IS investment decisions and that this is a consideration during SISP.

### *Originators of IS Initiatives*

Almost as important as the factors that may influence IS decisions are the proponents of IS initiatives in an organisation (Powell and Dent-Micallef 1997). In this regard, it is now more common to think of the majority of IS initiative as 'business projects' that require IT enablement, as opposed to IS projects per se. This implies that the focus is now on the 'business' (users) to initiate projects with IS as an active partner as opposed to the previously prevalent practise whereby the IS function may have initiated and championed IS projects (Henderson 1990; Campbell 1992). This is in keeping with the changing role of IS within organisations. It can be deduced therefore that this consideration is an important aspect of the SISP process.

### *Calculation of Return on IS Investments*

One of the most problematic considerations in the SISP process is the actual justification of IS investments (Dos Santos 1991; Benaroch and Kauffman 2000). Current practice is dominated by the use of financial (quantitative) techniques such as Discounted Cash Flow methods (including Internal Rate of Return, Net Present Value) and other Capital Budgeting techniques (Robson 1997; Renkema and Berghout 1997). Though useful, many of these techniques have been demonstrated to have a number of shortcomings with respect to the ability to capture the many intangible benefits arising from IS investments and thus may not fully reflect the true impact of IS investments (Dos Santos 1991). This consideration takes on added significance when analysed in conjunction with the factor relating to the tracking of IS investments. Consequently, a number of alternative techniques have been suggested as discussed in Chapter 2 including the use of more qualitative assessments.

### *Alignment of IS Investments with Corporate Strategy*

Henderson and Venkatraman (1993) describe the benefits of ensuring alignment between IS and corporate strategies and engaging in SISP is a practical tactic for achieving this state from two perspectives. First, it ensures that there is internal

consistency between business (business mission, objectives and plans) and IS planning outputs (IS mission, objectives and plans). Second, alignment ensures the external validity of both business and IS operational plans such that they are all embracing and balance the demands of both business and IT environments (Galliers and Baker 1994).

### *IS for Competitive Advantage*

A number of researchers (Porter and Millar 1985; Willcocks, Feeny and Islei 1997; Galliers and Baker 1994) have suggested that information and IS can change the manner in which an organisation competes in a number of ways, including:

- Better linkages between an organisation and its customers and/or suppliers
- More effective integration of the use of information in a value-adding process
- Better management of value chains
- Better development and delivery of new products and/or services
- Providing better management information that helps develop and implement better strategies

Thus IS can literally alter organisation – environment and organisation – organisation interactions and relationships, with added performance benefits particularly when the technology is revenue generating (Jasimuddin 2001; Narayanan 2001).

### *Efficient/Effective Utilisation of IS Resources by Organisation*

Utilisation has been defined as a key variable in the IS investment and organisational performance relationship (Trice and Treacy 1986). Consequently, it can be deduced that the degree of utilisation of a given set of resources, such as IS, would determine the level of benefits realised from that investment (Borovits and Gilardi 1993). Clearly this becomes an important consideration in the IS investment decision

process as financial resources will typically be channelled into those areas perceived to produce the most returns to the organisation.

#### *Development of Policies for IS (Architectures, Technologies etc)*

To ensure that all investment decisions made are appropriate and relevant to the organisation, there is a need to ensure that policies and frameworks exist to guide the decision making process. In addition, policies are necessary to ensure that due diligence is exercised in the IS investment process so that appropriate risk management is exercised (Korac-Kakabadse and Kakabadse 2001). Some authors refer to these activities collectively as IS governance and it is a field that is growing in importance within both the practitioner and academic communities (Sambamurthy and Zmud 1999).

#### **4.4.4 Managerial Effectiveness**

Weill and Olson (1989) and Weill (1992) discussed the concept of *Conversion effectiveness* and its effect as a moderating variable on the impact of IS on organisational performance. Thus, it was argued, and sustained through empirical evidence, that the degree to which IS investments can be used effectively will vary from one organisation to another thereby affecting the net impact on performance of those organisations (Miller and Doyle 1987; Seddon, Graeser and Willcocks 2002). Banker, Morey and Kauffman (1990) also discussed the effect of a similar construct that they termed the *intermediate production process* as being an important factor in complex managerial environments. Davern and Kauffman (2000) on the other hand referred to this variable as *Conversion contingencies*.

In the conceptual model, this variable is referred to as Managerial effectiveness to more accurately capture management's role in converting IS investments into value. This variable therefore highlights the need for management involvement in order for IS investments to produce the required value in terms of increased organisational performance. Harris and Katz (1991), although unable to establish a causal relationship between IS investment and firm performance, did find that those



organisations that also practiced good management of resources did tend to exhibit better performance compared to their counterparts. Frei, Harker and Hunter (2000) also acknowledged the importance of managerial intervention with and within a given strategy to achieve greater productivity. Thus, Frei, Harker and Hunter (2000) emphasised the role of management particularly with respect to the need to align issues such as technology, human resource management and capital investment for maximum benefit in and by FIs.

The conceptual model therefore adapts Weill's (1992) definition that suggests that the Managerial effectiveness component consists of five factors:

1. Senior management commitment to IS.
2. Firm experience with IS.
3. User satisfaction with IS.
4. The organisation's internal political environment.
5. The organisational structure.

Clearly, the five factors identified above can have far reaching effects on an organisation in general and its IS in particular. In the first instance, it is now a well-understood fact that without senior management commitment to IS, the development and use of IS in an organisation can be severely limited. Contemporary management practice encourages senior management involvement in all aspects of IS investment decision making from planning right through to implementation (Seddon, Graeser and Willcocks 2002).

When one considers the levels of expenditure typically associated with IS, it is not difficult to understand why this involvement is increasingly warranted and necessary (Carrington, Llanguth and Steiner 1997). The use of steering committees by organisations to manage critical IS resources, either during the early development stages or as part of ongoing operational management, has therefore become an accepted practice in many large organisations and further emphasises this importance (Pearlson and Saunders 2004). The use of committees is however not without its pitfalls as committees are constituted of various stakeholders possibly from different

divisions/departments, with possibly divergent objectives and which may therefore bring organisational politics into play (Jurison 1996; Griffin 1998).

The intensity of the effects of these political interactions are very much dependent on the organisational culture, structure and the individuals that make up the committee (Robbins 1987). Other issues that may exacerbate the impact of the political factor are the external environment and ownership structure (privately owned versus public-listed and whether it is a subsidiary and part of a much larger holding company). The net effect of a politically turbulent environment is to detract from a common purpose or goal as result of the pursuance of hidden agendas and self-interests (Wood et al. 2004). Inevitably, this may lead to a lower level of performance. Unfortunately, IS lends itself nicely to organisational politics by its very nature, since it permeates all aspects of an entire organisation (Peppard and Ward 1999). Almost everyone can be said to have an interest in IS, with some departments laying greater claim to IS for a variety of reasons (political or otherwise) depending on their own perceived importance to the organisation, an aspect that is usually based on assumed or actual contribution to an organisation's performance (Weber and Pliskin 1996).

Naturally, an organisation's previous experience with IS can work in many ways to militate against some of the effects of internal politics (Weill and Olson 1989). On the other hand, it is very possible that individuals within the organisation could subvert the process to satisfy personal interests if they have enough experience and understand the processes well. However, it can be expected that organisations with greater prior experience with IS are better able to deal with many of the issues that arise in IS management as they are more likely to have established IS management and change management procedures in place to aid both steering committees and IS managers in performing their duties (Wood et al. 2004).

In this research, user satisfaction relates to both internal users (employees) and external users (customers). The issue of user satisfaction is one that has continued to attract a lot of interest from both researchers and IS professionals, so much that a number of tools/measures of user satisfaction have been developed in an effort to operationalise this issue. These include instruments, such as SERVQUAL, that although originally developed for marketing purposes have been applied to IS

situations with reasonable success (Pitt, Watson and Kavan 1995). Some of these instruments have in fact been used as measures of IS effectiveness in their own right (Sethi, Hwang and Pegels 1993; Seddon 1997).

Since the early days of computing, it has been recognised that for a system to be fully utilised, the users for whom the system(s) has been developed must be comfortable with and happy to use the system(s). With this comes a number of considerations including, ease of use, accuracy of data/information, timeliness of data/information and availability of data/information to name a few. Further, the involvement of users a priori during the development of any system(s) is critical for engendering buy-in and future acceptability of the system(s) (Tan and Lo 1990).

The determination of user satisfaction may be further compounded by the fact that employees may not necessarily be able to choose which systems they can use within an organisation (DeLone & McLean 1992; Tan & Lo 1990). On the other hand, external users (customers) have a modicum of choice as they can, to a certain extent, choose the IT product channel with which to access the services offered by a FI (Figure 10.2) (Krishnan et al. 1999).

#### **4.5 The Importance of Context**

The Oxford English dictionary defines Context as (Soanes 2000):

*“The circumstances that form the setting for an event, statement or idea”*

Trauth (2001) observed that the discipline of IS, by its very nature, differs from Computer Science from which it evolved by virtue of the fact that IS explicitly focuses not only on IT but also on people and the organisations that in essence provide the context within which IS are embedded. These observations find support in Avgerou (2001) who, utilising a study in Information and Communication Technology (ICT) innovation, demonstrated that contextual analysis facilitated a much better understanding of the manner in which these innovations related to socio-organisational change. Further, the issue of context becomes even more relevant when one considers the pervasiveness of IS in organisations and the variety of issues

that may impact organisational performance. Furthermore, the issue of context is relevant from the two key theoretical standpoints, Stakeholder theory (people) and the RBV theory (the organisation).

Thus, Trauth (2001) highlighted the importance of context to IS research based on two key points:

1. The ever present need to recognise the changing scope of context.
2. The potential impact of context on both IS research and practice.

The first point underscores the fact that the IS discipline is not static and there is a need to utilise methods of research that can cater for this dynamism. The second highlights the bi-directional influences that exist in the relationship between research/practice and the phenomena under investigation. It can therefore be deduced that developing an understanding of context enables IS researchers to enhance their understanding of the phenomena under investigation in its natural setting. The foregoing also presents an excellent argument for the use of the Case research method in any investigation within IS in general and in research on the relationship between IS investment and performance in particular (Avgerou 2001).

It is perhaps because of this complexity that some researchers have shied away from the very difficult aspect of theory development in this particular area preferring instead to adopt 'quick fix' solutions via the more familiar variable/factor/hypothesis testing type of studies that have become endemic in IS research. Unfortunately and as described earlier, such activity has been suspected of leading to inconclusive and/or conflicting results.

In putting forward the preceding argument, the researcher acknowledges that there is a place for the use of quantitative methods within the IS research domain. The point being made here is simply that it may be premature to use such methods until appropriate theories have been formulated in the IS investment and organisational performance area.

As Trauth (2001) rightly observed:

*“If our discipline is going to remain relevant in the cyberspace era, if we are going to contribute in a meaningful way to the organisational, societal and global challenges that are being presented to humankind in the wake of pervasive information technology, then we have to acknowledge that a shifting contextual landscape is a normal part of our field.”*

Similarly, after their review of the literature pertaining to the problem at hand, Kauffman and Weill (1989) noted that the issue of organisational context was one that was not addressed in many of the reviewed studies. In retrospect it is easy to see how the use of positivist, single method research strategies (quantitative data collection and statistical analysis techniques) could result in the neglect of the context phenomenon. Not only is it difficult to measure, it is virtually impossible to quantify mathematically. It can thus be argued that the use of quantitative methods such as surveys which do not cater for or are unable to measure context may fail to elucidate and thus fail to resolve complex research problems such as the one under consideration (Kauffman and Weill 1989).

As can be seen from the foregoing, many studies therefore failed to take into account the effects of an organisation’s environment. It should be noted that the question of context is one that appears to plague IS research in general and has been noted as being an issue that may have contributed to the apparent of lack strong, generalisable theory in IS (Trauth 2001). It has also been suggested that this situation may have arisen from the predominance of the positivist paradigm in early IS research (Gregor 2002).

To illustrate, it has been noted that some authors actually refer to contextual variables as ‘confounding factors/variables’ and have attempted to control for these variables in their research designs (Im, Dow and Grover 2001). One may argue that this in fact a misnomer and may have contributed to the inconclusive/conflicting results obtained. Kauffman and Weill (1989) demonstrated this rather aptly and showed that the majority of studies in the sample that they reviewed did not take the issue of context into account.

From a practical perspective, it is evident that the multiplicity of potential factors in an organisation’s environment makes the operationalisation of this component very

difficult. Despite these acknowledged difficulties, Stakeholder theory provides an excellent tool for identifying many of these factors and interpreting the bi-directional relationships with the organisation through the application and interpretation of stakeholder maps (Freeman 1984).

The conceptual model therefore seeks to identify those factors in the environment that may impact an organisation with particular reference to IS investment decisions. The following sub-sections highlight of some these issues as they relate to FIs.

#### **4.5.1 External Factors**

It is generally accepted that organisations are affected in many ways by their environment and FIs operating in the Australian FSS are no exception. According to Harker and Zenios (2000a, p4):

*“Banking institutions today face a dynamic, fast-paced, competitive environment at a global scale”.*

No longer does competition only come from other FIs. The availability of technology has had a tremendous impact in breaking down entry barriers to the extent that organisations, such as retailers are now able offer products that have traditionally only been offered by FIs. Examples of such include supermarket and department store chains that are now offer facilities such as loans, credit cards and cheque cashing, to name a few, thus increasing the competitive pressure on FIs. Harker and Zenios (2000) also provided examples of logistics firms, such as United Parcel Service (UPS) and Federal Express, who were said to be considering the possibility of entering the arena of banking services provision. In addition, the advent of e-commerce technologies has fostered the growth of purely on-line World Wide Web-based FIs, which have taken competition for the provision of financial services to global scale (Sievwright 2002).

Additionally, stakeholders, such as customers, also influence FIs. Customers are becoming increasingly sophisticated and as a result are demanding more and faster access to banking products (Earl and Khan 2001). For example, no longer do customers do all their banking during normal working hours and consequently many

require access to their funds and information on their funds twenty-four hours a day (Earl and Khan 2001). Thus, customer service is fast becoming a distinguishing factor that ensures customer loyalty in a time when the many banking products/services and delivery channels being offered are *essentially* the same (Duncan and Elliot 2002).

As a result, FIs, which have traditionally been slow to change and conservative in many respects, now find themselves in a constant state of flux with ongoing restructuring within themselves and within the industry as mergers and acquisitions take place (Harker and Zenios 2000a). Hence, the measurement of performance and the identification of performance drivers is becoming increasingly important given the many different pressures that FIs now face (Frei, Harker and Hunter 2000).

#### **4.5.2 Internal Factors**

From an internal perspective, IS have become so pervasive and ubiquitous that many FIs are unable to survive, even for a short time, without their IS. Consequently, IS play a number of key roles in FIs as they (Harker and Zenios 2000b):

- Are a part of the production technology
- Form a critical link between front and back office functions
- Affect the design and execution of processes
- Have a direct impact on staff

Clearly there is a need to better understand how the internal features and characteristics of a FI may influence the role of IS, with consequent effects on performance. This task is very complex and it is argued that utilising Stakeholder theory could assist in providing some insights into the problem (Li and Ye 1999).

## **4.6 Significance and Importance**

### **4.6.1 Research**

This research was deemed significant as it:

- Builds on existing research on the business value of IS in general and on the relationship between IS investment and organisational performance in particular.
- Increases understanding of the impact of IS on organisational performance, within the FSS.
- Broadens the theoretical base as few studies of this nature have been conducted, due in part to the complexity of conducting such research. Markus and Soh (2000) also highlight the lack of a strong theoretical base in this field. Furthermore, the majority of the research to date has been in the United States of America, with little research having been conducted in other countries (Chapter 3).
- Focuses on a single economic sector to facilitate comprehensive analyses. Previous investigations have tended to be broad in their scope, covering multiple (and different) industries in multiple (and different) economic sectors. Consequently, the comparability and generalisability of such studies has been problematic. Harris and Katz (1988) observed that it is important to initially study organisations within a single economic sector in order to generate any useful data, the analysis of which can then make a more meaningful contribution to the growth of knowledge in that particular area.
- Against a background of ever-increasing investment in IS, there is a need to further investigate the impact of this investment on organisational performance, as some studies have been able to show a positive relationship yet others have been inconclusive (Campbell 1992; Carrington, Llanguth and Steiner 1997).

In the FSS, there is growing consensus between researchers and practitioners that not enough research has been undertaken to investigate the IS investment and organisational performance relationship in FIs, although a lot of work has been done



to increase the understanding of the markets in which these organisations exist (Harker and Zenios 2000b). The *American Banker 1988 Managing Technology Survey* (Zimmerman 1988) reported that 55% of senior managers surveyed were able to confirm that their IS investments were of good or excellent value, yet half of them said they did not have any formal mechanism with which to justify this claim.

Given that the FSS is a major employer in many countries and one which spends a significant portion of its annual budget on IS investments, the need to understand the effects of this investment becomes critical, not only to the organisations themselves but to all stakeholders (Gurbaxani, Melville and Kraemer 2000).

Thus, the research problems identified and stated in Chapter 1 are of significant interest to both industry and academia. Further, not only are these problems complex, they are also deemed important, some might even say critical, to the survival of many contemporary organisation given the prevalence and diffusion of IS (Kivijarvi and Saarinen 1995). Practical experience has shown that even though organisations continue to invest in IS, the true nature of the contribution of IS to an organisation's performance is still not clear nor can it be easily quantified.

This research therefore intends to investigate the IS investment and organisational performance relationship to gain a clearer perspective of how organisations can maximise their existing and future investments in IS. From an academic perspective, such knowledge will be useful not only for future research but also in the development and training of IS professionals. From a practical perspective, the results of this research are expected to, inter alia, contribute to a better understanding of the many factors that influence decision-making processes regarding IS investments.

#### **4.6.2 Conceptual Model**

A review of the literature (Chapter 2) and a subsequent meta-analysis of the same (Chapter 3) have both shown that, although there has been some research into the relationship between IS investment and organisational performance, much more work is needed to broaden both the theoretical and practical knowledge base. Thus, a

number of weaknesses have been identified in earlier research that have contributed to prior models' inability to clearly explain this relationship. To address these shortcomings, this research utilises a pluralist approach (Mingers 2001) in an exploratory framework (Eisenhardt 1989) to develop a conceptual model that better explains this relationship. Thus, the conceptual model described in this chapter is grounded in the literature and defines a complete relationship in which all components are tightly integrated.

The conceptual model has four main components that it relates in a combined variance and process model (Seddon 1997) designed to assist IS professionals and researchers in a number of ways including, but not limited to:

- Facilitating in the development of better research designs for future research into the relationship between IS investment and organisational performance in the FSS
- Enabling senior management to better manage, plan and implement their IS
- Providing researchers with a tool with which to better understand and manage the benefits arising from IS investments

Thus, it is anticipated that the conceptual model will help improve understanding of the IS investment and organisational performance relationship and hence contribute to the building of a strong theoretical and practical base for this field of research.

## **4.7 Chapter Summary**

This chapter presented the conceptual model upon which the research reported in this thesis was based. The chapter begins by exploring the theoretical foundations of the conceptual model. Thus, three key theoretical perspectives are discussed, the Resource Based View of the firm theory, Stakeholder theory of the organisation and General Systems Theory. Arguments were presented that demonstrated the suitability and applicability of these theories in all phases of the research beginning with the definition of a conceptual model through its development to testing and finally in the interpretation of the results from the research. Thus, it was demonstrated that the

conceptual model was thoroughly grounded in the literature and utilised knowledge/theory from diverse disciplines, such as Organisational science and Management science in an endeavour to build a cumulative tradition of research.

To explain the derivation of the conceptual model, the chapter presents a comprehensive chronological review of the most influential models the IS investment and organisational performance relationship, from the mid 1970s to the 1990s. This review presented a comparative analysis of strengths and weakness of these early models and thus provided a clear description of the context in which the proposed conceptual model was developed. It was therefore evident from the review that there were a number of weaknesses in these early models and these discussions clearly highlighted the need for the conceptual model and the significance of its potential contribution (both practical and conceptual) to the development of knowledge on the IS investment and organisational performance relationship.

After this detailed review, the chapter then presented and discussed the conceptual model, its individual components and the factors that constitute them. These components are: a) the level of IS investment (represented by the IT portfolio), b) Organisational performance, c) Managerial effectiveness and d) Considerations for SISP. These components are related via a combined process and variance model which seeks to explain the IS investment and organisational performance relationship. Further, and unlike much of the earlier research were the apparent lack of recognition of the impact of context was a consistent weakness, this research explicitly acknowledges the impact of context on this relationship. Consequently, the discussions in this chapter also examined the role and impact of context in detail, and presented supporting arguments for the need to incorporate this issue into the development of any model on the IS investment and organisational performance relationship. Finally, this chapter presented arguments for the significance and importance of this research and resultant conceptual model. Given the foregoing, it is evident that this research is likely to make a significant and important contribution to the IS discipline and thus lead to a better understanding of the IS investment and organisational performance relationship

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# 5.0 Research Methods

## 5.1 Introduction

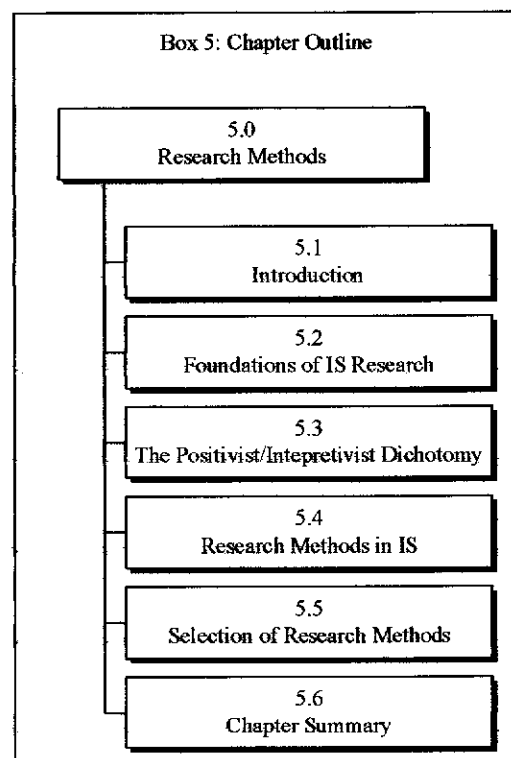
The primary objective of this chapter is to present arguments for selection of the research methods used in this research by reviewing the many research methods available to the IS researcher.

Section 5.2 presents the foundations of IS research in general. This discussion sets the scene by taking a close look at the theoretical foundations of IS research as prelude to discussions on the differing perspectives in modern IS research and the suitability and applicability of different types of research methods.

Section 5.3 discusses the Positivist/ Interpretivist dichotomy and examines the philosophical merits of both perspectives and their influence on the selection of research methods.

Section 5.4 presents an overview of research methods available to the IS researcher and discusses their relative strengths and weaknesses prior to the presentation of arguments for the selection of the research methods utilised in this study.

Section 5.5 presents a detailed discussion of the selection of research methods used in this research coupled with arguments regarding their suitability, with particular emphasis being placed on the need to develop theory. The chapter concludes with a brief summary.



## **5.2 Foundations of IS Research**

As discussed in Chapters 2 and 4, the discipline of Information Systems is still relatively young and owes its development to a number of disciplines (Management Science, Organisation Science and Computer Science) from which it has drawn theory (Lee, Gosain and Im 1999). Consequently, many of the research methods used in these disciplines have been adopted and adapted to IS research in an effort to build a cumulative tradition of research in IS (Culnan 1986; Mason, Mckenney and Copeland 1997). Although IS itself has made significant progress and growth since its infancy in the early 1970s, its development (or lack thereof) has been criticised on a number of fronts, including a perception about a lack of: a) focus, b) strong stable foundations, c) IS-based theory and d) impact on practice (Lee, Gosain and Im 1999).

In addition, criticisms have also been levelled at the apparent lack of relevance and rigor in the development and use of IS research methods and instruments. Benbasat and Zmud (1999) discussed this problem and suggested a number of recommendations aimed at improving the degree of relevance and rigor in IS research. Davernport and Markus (1999) though agreeing with Benbasat and Zmud (1999), took this further and argued strongly that it is the IS researchers themselves that need to change if their work is to become more relevant to both academia and practice.

## **5.3 The Positivist/Interpretivist Dichotomy**

Modern IS research exists on a continuum from the highly positivist, single method paradigm through the pluralistic, multiple methods school of thought, to the highly interpretivist, single method paradigm as illustrated in Figure 5.1. Many arguments have been presented regarding the applicability of each of the paradigms to IS research (Galliers 1990). Whilst some researchers have argued strongly in favour of the use of positivist approaches so that IS, as a discipline, may emulate the natural sciences, possibly due to its partial grounding in Computer Science, others have

argued equally strongly for the use of Interpretive approaches, due to its partial grounding in Management Science (Lee 1991; Gregor and Hart 2002).

More recently, however, there has been a growing call for the adoption of integrated approaches to IS research with the growing realisation that the two paradigms are not necessarily mutually exclusive (Lee 1991; Orlikowski and Baroudi 1991).

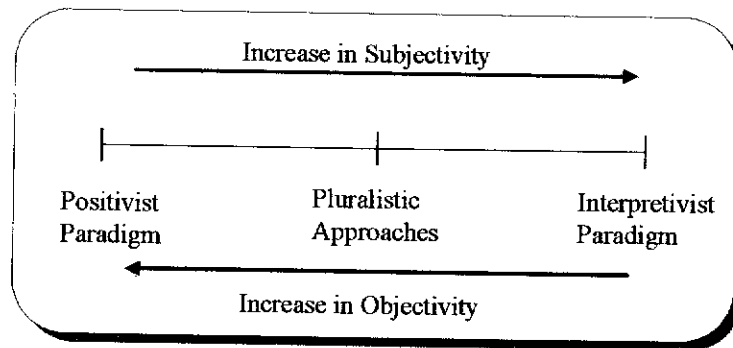


Figure 5.1: The Positivist/Interpretivist dichotomy

The characteristics of these two philosophies are summarised in Table 5.1.

Positivism	Interpretivism
Assumes objectivity in the observer, and that the phenomenon under observation can be measured	Researcher looks for meaning in the social context. Interpretation is subjective and depends on the observer
Assumes existence of some fixed relationships that can be measured using structured/ standard instruments	Does not assume the existence of fixed relationships
Tests theory	May be used for theory building as opposed to theory testing
Characteristics include; <ul style="list-style-type: none"> <li>● Formal propositions</li> <li>● Hypothesis testing</li> <li>● Variables can be quantified</li> <li>● Population inferences can be made from samples</li> </ul>	Characteristics include; <ul style="list-style-type: none"> <li>● Non-deterministic perspective</li> <li>● Increases understanding in culture or context</li> <li>● Data collected in natural setting</li> </ul>

Table 5.1: Summary and comparison of underlying philosophies in IS research (adapted: Galliers (1990))

According to Neuman (2000), modern research is founded on three main philosophies, Positivism, Interpretivism and Critical Social Science. Critical Social Science combines ideographic and nomothetic approaches, however it's use in IS research is limited (Orlikowski and Baroudi 1991). Consequently, the discussions in

this chapter shall be restricted to the more commonly used approaches founded on Positivism and Interpretivism.

Kaplan and Duchon (1988) observed that the dominant approaches to research in IS have been based on the positivist paradigm and that most studies have measured quantitative outcomes such as technical, economic, effectiveness/efficiency and performance. Grover, Lee and Durand (1993) in a review of MIS research literature also found that the survey method was the most predominant research method used in the period 1980 to 1989 with explanatory surveys being used more than descriptive surveys. The meta-analysis reported in Chapter 3 found similar results with 90.7% of survey studies being positivist and 93% being explanatory.

However, when one considers the evolution of IS from Computer Science and related 'technical' fields these observations should hardly come as a surprise. It was also probably because of this 'scientific background' that the use of Interpretivist methods such as Case research and Subjective/Argumentative approaches (Hermeneutics, Phenomenology, Ethnography etc) may not have been deemed appropriate and valid as IS research methods until fairly recently (Klein and Myers 1999). The foregoing observation was supported by Orlikowski and Baroudi (1991, p1) who, after surveying 155 IS research articles, found that:

*"...although this research is not rooted in a single overarching theoretical perspective, it does exhibit a single set of philosophical assumptions regarding the nature of the phenomenon studied."*

Orlikowski and Baroudi's (1991) results also showed a strong leaning towards the positivist paradigm with methods such as Survey and Laboratory-oriented studies dominating. After extensive analysis, Orlikowski and Baroudi (1991) concluded by suggesting the adoption of a pluralist approach in order to capture the many dimensions of an IS research problem. In support of this, Kaplan and Duchon (1988) had earlier provided an excellent example that demonstrates how different approaches can be used to complement each other. To elaborate, Kaplan and Duchon (1988) initially utilised quantitative (statistical) methods in their preliminary analyses, which were then followed up with qualitative analyses to capture those aspects that the quantitative methods could not capture. The success of this approach

led Kaplan and Duchon (1988) to conclude that the pluralist approach to research was valid and highly useful in IS research.

The following sub-sections discuss/compare Positivism and Interpretivism in detail, using three dimensions (Guba and Lincoln 1994):

1. The Ontological dimension – Nature and form of reality.
2. The Epistemological dimension – Nature and form of relationship between researcher and subject(s).
3. The Methodological dimension – How can the researcher gather and analyse information about the phenomena under investigation.

### 5.3.1 Positivism

Neuman (2000, p65) states that Positivism is “the approach of the natural sciences”. Consequently, positivist studies are (Orlikowski and Baroudi 199, p51):

*“...premised on the existence of a priori fixed relationships within phenomena which are typically investigated with structured instrumentation. Such studies serve primarily to test theory, in an attempt to increase the predictive understanding of the phenomena.”*

Thus, the positivist philosophy’s underpinnings are that the goal of knowledge is to describe a phenomenon as it is manifested and does not question whether it exists or not. The development of the positivist philosophy can be traced to the French philosopher Auguste Comte (1798-1857), who coined the term *Sociology* and is thus believed to be the founder of modern day Sociology. Comte developed most of the positivist principles in use today in a set of six volumes, during the period 1830-1842, called ‘Cours de Philosophie Positive’ (The Course of Positive Philosophy). The development of positivism was later extended through the work of other philosophers, most notably John Stuart Mill (1806-1873) a British philosopher, in his writings entitled ‘A System of Logic’. From these beginnings have grown the various forms of modern positivism including; the Conventional view, the Covering Law



Model, Logical Empiricism, Post-Positivism, Naturalism, and Behaviourism (Neuman 2000).

From an epistemological perspective, Positivism assumes objectivity in the observer on the basis that the phenomenon under investigation can be measured empirically (Shanks 2002). Further, Positivism assumes that causal relationships exist between the phenomena under investigation. This ontological position is known as ‘external realism’ although some researchers have referred to it as ‘naïve realism’ (Shanks 2002). Furthermore, hypotheses are postulated and empirically tested for confirmation or otherwise using robust standard/structured instruments. The methodological arguments behind this approach being that the use of such instruments results in generalisable and acceptable results with a higher level of validity, reliability and replicability (Shanks 2002).

According to Lee (1991), the predominant argument for the logical (or empirical) positivism school of thought has been that, by applying methods derived from the natural sciences, the social sciences may be able to match the achievements of the natural sciences. This perspective may have developed from the apparent low acceptability of methods that were originally perceived to be mainly interpretive, such as Case research (Hirscheim 2002). Lee (1991, p343 – 344) concluded that the “positivist approach involves the manipulation of propositions using rules of formal logic and the rules of hypothetico-deductive logic so that the theoretical propositions satisfy the four requirements of falsifiability, logical consistency, explanatory power and survival”. In summary therefore, Positivism is characterised by:

- Formal propositions
- Hypothesis testing
- Quantification of variables
- Broader population inferences being made from small samples

Methods that use a positivist approach tend to rely predominantly on quantitative data and include Secondary data, Laboratory Experiment, Field Experiment, Survey and Case research. It should be noted however, that Case research is a flexible method that can be used to collect and analyse either quantitative or qualitative data

(or both) depending on the research design employed. This flexibility not only sets Case research apart, it is also one of the key strengths of Case research.

### **5.3.2 Interpretivism**

Neuman (2000, p71) defined Interpretivism as:

*“...the systematic analysis of socially meaningful action through the direct detailed observation of people in natural settings in order to arrive at understandings and interpretations of how people create and maintain their social worlds.”*

According to Neuman (2000), Interpretivism has its origins in the Social Sciences through the work of Max Weber (1864 – 1920) and Wilhem Dilthey (1833 – 1911). Thus, Dilthey is said to have argued the existence of two fundamental types of science, *Naturwissenschaft* (based on the principles of ‘abstract explanation’) and *Geisteswissenschaft* (based on the principles of ‘empathetic understanding’). Weber is said to have been more inclined to the latter view in his conceptualisation of Sociology as a science of and for social action (Neuman 2000). It has therefore been suggested that Interpretivism arose as an opposing paradigm to the need to make a natural science out of the Social Sciences.

Interpretive approaches stem from three ontological positions the first being ‘External realism’ (similar by definition to Positivist ontological position). The difference here lies in the fact that Interpretivism does not assume objectivity in the researchers and their interaction with the phenomenon under investigation. The second position is ‘Internal realism’ in which reality is considered an inter-subjective construction and the third ‘Subjective realism’ based on an individual’s personal construction of reality (Nandhakumar and Jones 1997).

Epistemologically, Interpretivism searches for meaning in social context, hence Weber’s arguments on the need for the Social Sciences to look for meaning in social context and action (Neuman 2000). Unlike Positivism, Interpretivism does not assume the existence of fixed relationships. Consequently, it is accepted that resultant interpretations are subjective and depend on the observer, thus making this

paradigm ideal for theory building as opposed to theory testing. Thus, the characteristics of Interpretivism include:

- A non-deterministic perspective
- It aims to increase understanding in culture or context
- Data collected in natural setting

Methods that take an interpretivist approach tend to use qualitative data and include Phenomenology, Hermeneutics, Case research, Ethnography, Constructionism, Idealist Sociology, Subjectivist Sociology and Cognitive Sociology (Glaser and Strauss 1967).

Thus, researchers utilising interpretivist approaches would argue that the methods proposed by the natural sciences, are both inappropriate and inadequate for investigating social phenomenon (Lee 1991). Whereas the positivist approach focuses on physical realities, interpretive approaches on the other hand consider people and the artefacts they create. Consequently, there is an inherent assumption in Interpretivism that people create subjective and inter-subjective meanings, which they associate with these objects. It is these meanings that the interpretivist seeks out and utilises as a vehicle to explain observed phenomena.

### **5.3.3 Pluralism in IS research**

As suggested in the preceding sub-section, the acceptability of combining multiple methods in IS research has, in the past, been quite low. Gable (1994, p112) (citing Smithson (1991)) pointed out that:

*“(1) doubts exist over the legitimacy or feasibility of combining positivist and interpretive approaches, (2) vulnerability stemming from the close correspondence between many researchers value systems and their single methodology paradigm, (3) practical concerns over possible contradictory results from multiple methods.”*

In reaching the above conclusion, Gable (1994) considered five different attitudes regarding research: a) Supremacy, b) Contingency, c) Pluralism, d) Eclecticism and e) Dialectics and eventually advocated a pluralistic view that accepts the use of multiple methods and tools.

Earlier, Lee (1991, p342-343) called for researchers to contemplate the combined use of positivist and interpretivist approaches as a mechanism for “strengthening the other in a truly collaborative research effort, as opposed to one that merely allows the two approaches to maintain peaceful, but separate coexistence.”

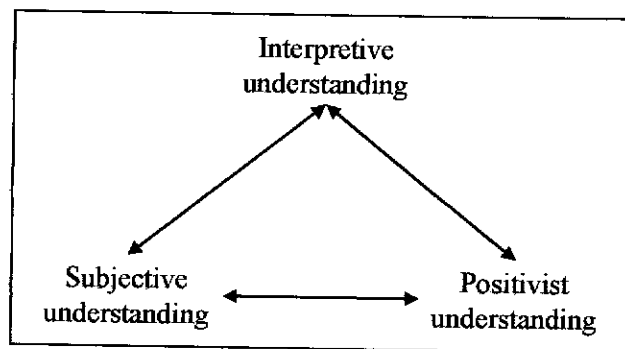


Figure 5.2: Integrating positivist and interpretivist approaches (adapted (Lee 1991))

Thus, Lee (1991) suggested a framework based on three levels of understanding such that (Figure 5.2):

- First level – Consideration of human subjects and the way they see themselves in their context
- Second level – Researcher’s interpretation and understanding of the first level
- Third level – knowledge (theoretical propositions) created and tested by the researcher to explain events observed

According to Lee (1991), the relationships between the three levels are cyclical and iterative based on the idea of integrating two paradigms that have typically been thought of as separate, opposing and incompatible. Thus, Lee (1991) suggested that within each iteration multiple analytic tools could be used “with justification and without contradiction” (p364). To illustrate this point further, Table 5.2 demonstrates how the relative strengths and weaknesses of three popular research methods can be used to complement each other (Gable 1994).

Appropriate caution still needs to be exercised when considering the use of multiple methods and such a strategy should only be adopted if the situation permits and an appropriate research design has been drawn up.

Characteristic	Case research	Survey	Experimentation
Controllability	Low	Medium	High
Deductibility	Low	Medium	High
Repeatability	Low	Medium	High
Generalisability	Low	High	Medium
Discoverability	High	Medium	Low
Representability	High	Medium	Low

Table 5.2: Comparison of strengths and weakness of three commonly used research methods (Source: Gable (1994))

Alavi and Carlson (1992) conducted an analysis of the literature spanning a 20-year period, 1968 to 1988, with the aim of building a clearer picture of the research and disciplinary development of the field and thereby establish the status quo of MIS research. Their study highlighted several important trends and future directions for research and resulted in the following observations and conclusions:

1. Early MIS literature appeared dominated by non-empirical studies.
2. Most research was found to be internally focused on IS management, IS development and operation, whilst issues such as the technical and external environments were not given enough focus.
3. A lack of MIS theory.
4. Dominance of positivism.
5. Need for plurality of research methods.

Items 1 and 3 were considered and discussed in Chapter 2, item 2 was discussed in Chapter 4, and item 4 in Section 5.3.

Lacity and Janson (1994) also added voice to growing chorus of concern over the predominance of positivist, quantitative studies in the IS literature. This dominance was also observed and confirmed in the meta-analysis conducted as part of the development of this research (Chapter 3).

Further, whilst evaluating the use of various IS research methods as reported in leading IS journals for the period 1991 to 1995, Lai and Mahapatra (1997) found that Case research and Field study methods were being used increasingly over other methods, thus reflecting what they considered to be a maturing of IS research. This point is noteworthy as the Case research method in particular is a very good tool that has, and continues to be, used to build theory. Most recently, Mingers (2001) strongly argued for and advocated the use of a pluralist approach to IS research, with attention being paid to the context in which the research is conducted.

#### **5.4 Research Methods in IS**

According to Mingers (2001, p241) 'research' is:

*"...conducted by undertaking particular activities such as administering and analysing a survey, conducting a controlled experiments, doing ethnography or participant observation, or developing root definitions and conceptual models."*

Thus, a research method is constituted of a set/sequence of tasks that produces a suite of 'results'. Some researchers may argue that research methods are inextricably tied to a particular paradigm, either positivist or interpretivist, however as Mingers (2001) observed, this perspective may not entirely be accurate as it is possible to "detach research methods (and perhaps even methodologies) from a paradigm and use them critically and knowledgeably within a context that makes different assumptions." (Mingers 2001, p243).

The latter view supports the adoption of a pluralist approach to research in general and IS research in particular, an approach that is gaining growing acceptance amongst IS researchers (Kaplan and Duchon 1988; Gable 1994; Mingers 2001). This contemporary view however, is in stark contrast to much of the earlier research which tended to be polarised between the positivist and interpretivist paradigms and therefore reflects the aforementioned increasing maturity of the field of IS (Galliers 1990; Orlikowski and Baroudi 1991). Thus, this research also advocates (and

utilised) multiple methods in developing a conceptual model of the IS investment and organisational performance relationship.

Galliers (1990) proposed and discussed a comprehensive taxonomy of research methods that has been used in IS research not only as a very useful teaching aid for research methodologies but also as a tool upon which to base the selection of appropriate research methods. In this taxonomy, the various characteristics of available research methods, data collection strategies and analytical techniques are discussed with regards to their suitability in a given situation. This taxonomy enabled the explicit identification of 13 research methods (seven (7) empirical and six (6) non-empirical).

It is noteworthy that the Galliers (1990) taxonomy categorised research methods as either 'scientific' or 'interpretivist' depending on their ethos. In that taxonomy, Galliers (1990) assumed that scientific equated to positivist and that interpretivist equated to non-scientific. However, it may be more accurate to categorise research methods in terms of whether they are *empirical* or *non-empirical* (Alavi and Carlson 1992) as this more accurately reflects the type of data extracted from the subject(s). This latter perspective was adopted in the execution of the meta-analysis reported in Chapter 3, and was found to be more practical in facilitating understanding of the various research methods available. Further, this perspective was also utilised in the selection of research methods for this research.

#### **5.4.1 Measurement**

Quantitative methods focus on the collection and analysis of data that is numerical, whereas qualitative methods focus on the collection and analysis of data in the form of words or pictures (Chan 2000). However, this is not the only difference between the two types of data. According to Neuman (2000), three features distinguish between the measurement of qualitative and quantitative data as shown in Table 5.3.

Feature	Qualitative Measurement	Quantitative Measurement
Timing	Measurement occurs during data collection process	A priori determination of variables
Data Form	Multi-format – text or pictorial. May include some numerical data	Numerical
Logic	Partial conceptualisation of ideas ex ante, with full development during actual data collection	Full conceptualisation of ideas ex ante data collection

Table 5.3: Summary of qualitative and quantitative measurement

Regarding, the question of ‘timing’, quantitative methods typically require the researcher to spend a significant amount of time in the a priori definition of variables and how they will be quantified for measurement, whereas in qualitative methods this activity is not an a prior consideration (Sekaran 2000).

The next significant difference lies in the actual form and representation of the data. Quantitative data is numerical, whereas qualitative data can take various forms, including text (words) and pictorial (visual) (Miles and Huberman 1994). The final distinguishing feature is the issue of the logic that links data to the ideas. In quantitative measurement, the methods used require full conceptualisation of the ideas prior to the commencement of data collection, whereas qualitative measurement only needs a partial conceptualisation before data collection begins. Qualitative measurement therefore relies on the method used to facilitate fuller development of the ideas during the data collection and analysis process (Yin 1994).

Thus, each category of measurement has a number of data collection methods associated with it. As these methods may influence the research design, it is imperative that researchers have a clear understanding of all available methods and the associated paradigm (Galliers 1990).

## 5.5 Selection of Research Methods

As discussed in Chapter 1, this research was directed at understanding the relationship between IS investment and organisational performance in FIs within the



Australian FSS. To achieve this, the study utilised a three-phase research strategy (Chapter 6) based on an extension of the framework originally proposed by Eisenhardt (1989). Within this extended framework, the research utilised a combination of methods. In the first instance, Case research was used to develop and test the conceptual model. This was later followed up with a survey that facilitated further testing and refinement of the model. Guidelines provided by Sekaran (2000), Eisenhardt (1989) and Neuman (2000) were taken in account and utilised in drawing up the research design as discussed in Chapter 6.

Using taxonomies from (Galliers 1990; Pervan 1994b), a short-list of the most appropriate methods was derived as shown in Table 5.4.

Research Method	Research Question Form	Control Over Situation/ Events Required?	Focuses On Contemporary Events	Suitable?
Experimental research	How? Why?	Yes	Yes	X
Survey	Who? What? Where? How many? How? Much?	No	Yes	√
Historical/Comparative research	How? Why?	No	No	X
Case research	How? Why?	No	Yes	√

Table 5.4: Criterion for selection of research methods (adapted from (Yin 1994))

As can be seen in Table 5.4, the research methods deemed most appropriate to this research were subjected to three selection criteria as follows:

What is the form of the research question?

The primary research question reads as follows (Chapter 1):

*'How are IS investments and organisational performance related in Financial Institutions?'*

The secondary research questions were also worded in a similar fashion (Chapter 1). Thus, the form of the research question suggested that the study sought to clarify and understand this relationship by clarifying *how* (and possibly *why*) the two phenomena are related (Yin 1994).

#### Is control over behaviour/events required?

The second criterion for the selection of the most appropriate research methods was related to the level of control that needed to be exercised on the events/situation in which the relationship is being investigated. As this research sought to investigate the relationship in situ without exercising any form of control over the situation/events, the criteria resulted in the elimination of both Experimental and Action research methods (Galliers 1990).

#### Does the research focus on contemporary events?

The final criterion applied to the research methods was the research focus (ie historical, contemporary or future). In this instance, the research focussed on contemporary events. Applying this final criterion eliminated Historical/Comparative research methods, leaving Case research and Survey (Yin 1994).

In summary therefore, the preceding discussion clearly demonstrates that the selected research methods met the requisite criteria. The following sub-sections more closely examine other issues relating to both Case research and Survey research regarding the suitability of the two research methods.

### **5.5.1 Suitability of Case Research Methods**

According to Eisenhardt (1989, p534):

*“The Case Study is a research strategy that focuses on understanding the dynamics present within single settings.”*

After deliberating on the various research methods available for IS research (Section 5.4) and the criteria applied in Section 5.5 (Table 5.4), a decision was reached to utilise Case research to develop the conceptual model. To further demonstrate the suitability of Case research for this project, consider the following comparison of qualitative research strategies as suggested by Cavaye (1996):

Characteristic	Case Research	Field Research	Action Research	Application Description	Ethnography
Use of Cases	✓	✓	✓	✓	✓
Aims for understanding context	✓		✓	✓	✓
Does not define a priori constructs	✓		✓	✓	✓
Topic defined by researcher	✓	✓		✓	✓
No intent of interference with phenomenon	✓	✓		✓	✓
Attempts to contribute to knowledge	✓	✓	✓		✓
Relates findings to generalise theory	✓	✓	✓		
Interpretation from researcher's point of view	✓	✓	✓	✓	

Table 5.5: Comparison of qualitative research strategies (Source: (Cavaye 1996))

Thus, Table 5.5 further highlights the suitability of the Case research method compared to other methods. In this instance, the objectives of the research were clearly synchronous with and supported by the characteristics of Case research shown in Table 5.5. Furthermore, the Case research method was chosen primarily because the research was exploratory with the aim of theory/model building and because the nature of the problem lent itself well to the use of this method (Benbasat, Goldstein and Mead 1987).

Thus, Case research was particularly attractive for this research as it was evident that there existed and still exists a problem about which there seems does not seem to be

a clear agreement in the reviewed literature (Chapters 2 and 3) and which is clearly difficult to explain sufficiently using existing theory. Hence, quantitative methods were not deemed suitable for use in first two phases, primarily because of the lack of a good causal model that could be tested empirically. As alluded to earlier the first two phases of this research were focused on the definition and development of the conceptual model (Shanks 2002).

In addition to the strengths and weaknesses of Case research as discussed in (Galliers 1990), Yin (1994), Eisenhardt (1989), and Cavaye (1996) further provided complementary support as to the suitability and applicability of Case research as it:

- Can be used to develop theory that is innovative
- Usually results in theory that is testable
- Usually results in theory that is empirically valid
- Ensures that issues of context are understood
- Contributes to knowledge
- Produces findings that are generalisable

Furthermore, Yin (1994, p13) recommended Case research because it:

*“...copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result relies on multiple sources of evidence, with data needing to converge in a triangulating fashion and as another result benefits from the prior development of theoretical propositions to guide data analysis.”*

In fact more IS researchers are now advocating the use of the Case research method as a tool for developing and testing theory in the field of IS (Pervan 1994a; Klein and Myers 1999; Pare 2001).

Thus, Cavaye (1996) referred to Case research as a multi faceted approach that can be used in both positivist and interpretivist research. Further, the fact that Case research accommodates both single and multi-case scenarios using various units of analysis makes it a highly versatile and very suitable technique for conducting

research in many fields of research irrespective of their level of maturity and for all types of research from exploratory through explanatory to descriptive (Cavaye 1996; Yin 1994).

### The Need to Develop Theory

The IS research literature is replete with calls to develop theory with many authors lamenting the lack of testable theory/models in many of the research fields in the IS discipline (Gregor 2002). This problem was clearly demonstrated in the discussions relating to the IS investment and organisational performance relationship (Chapter 3). Further, Markus and Soh (1993) and Mahmood and Mann (1993) all underscored the apparent lack of adequate theory regarding the relationship between IS Investment and organisation performance. In fact, Lee, Gosain and Im (1999, p234), summed these concerns quite succinctly as follows:

*“IS research has been characterised by trying to understand phenomena after they have occurred, moving from one management fad to another without building a cumulative tradition.”*

Pare and Elam (1997, p543) in their discussion of existing literature, within the context of IS implementation, went one step further and specifically highlighted the fact that:

*“...researchers have built models that identify a limited set of critical factors affecting IT implementation success, but we know little about how and why the factors included in these models interact and work together to produce success or failure.”*

In essence, and as alluded to by Pare and Elam (1997), a situation pertains where IS researchers are in effect ‘jumping the gun’ by identifying a set of variables and then proceeding into variable/factor/hypothesis testing studies through statistical analysis and other means, when insufficient theory development has been undertaken. Consequently, it is hardly surprising that many such empirical studies have produced results that are inconclusive at best and conflicting at worst, particularly in the field

of IS investment and organisational performance. When one considers the foregoing in conjunction with observations by Kauffman and Weill (1989) regarding:

- Lack of a tradition of using commonly accepted measures that would lead to more consistent results
- Difficulties in gathering data
- Lack of robust methods that are reliable and can provide generalisable results across various settings

One is led to conclude that more rigorous and relevant theory development research is required if the discipline of Information Systems is to truly develop a cumulative tradition of research. This was clearly highlighted in both the literature review and meta-analysis (Chapters 2 and 3) which both emphasised that researchers do need to take these issues seriously if progress is to be made. Sadly, many of the problems relating the conduct of IS research which have been highlighted in the past persist to date (Benbasat and Zmud 1999).

It is therefore argued in this research that there is a pressing need for researchers to develop theory, using methods such as Case research, that can later be tested empirically through whichever means are deemed suitable (Eisenhardt 1989). This is also inline with recommendations by Kaplan and Duchon (1988) and Mingers (2001) who have all advocated a pluralist approach to IS research.

### **5.5.2 Suitability of Survey Research Method**

According to Neuman (2000, p285):

*“...the Survey is a process in which researchers translate a research problem into questionnaires, then use these with respondents to create data”.*

Surveys can be used either as the primary or secondary method in IS research. In this instance, the latter applies as the research design incorporated the use of a survey in the final stages of the project to conduct preliminary testing of the conceptual model.

The Survey research method was incorporated in the research design to further strengthen the resultant model and thus gauge its applicability and appropriateness to both research and practice.

Neuman (2000) identified three (3) different types of surveys. Their relative advantages and disadvantages are presented in Table 5.6 with the survey type found to be most appropriate and selected for this study highlighted.

Features	Mail Questionnaire	Face to Face Interview	Telephone Interview
<b>Administrative Issues</b>			
Cost	Cheapest	Moderate	Expensive
Speed	Slowest	Fastest	Slow to moderate
Length	Moderate	Short	Longest
Response Rate	Lowest	Moderate	Highest
<b>Research Control</b>			
Probes possible	No	Yes	Yes
Specific respondent	No	Yes	Yes
Question sequence	No	Yes	Yes
Only one respondent	No	Yes	Yes
Visual observation	No	No	Yes
<b>Success with different questions</b>			
Visual aids	Limited	None	Yes
Open-ended questions	Limited	Limited	Yes
Contingency	Limited	Yes	Yes
Complex questions	Limited	Limited	Yes
Sensitive questions	Limited	Some	Some
<b>Sources of bias</b>			
Social desirability	No	Some	Worse
Interviewer bias	No	Some	Worse
Respondents reading skills	Yes	No	No

Table 5.6: Types of surveys and their features (Neuman 2000)

The same sampling frames may be used in each of the three types of survey research, which may be either random (simple or stratified) or theoretical (systematic or cluster), to determine the nominated sample size, its location and the types of respondents (Neuman 2000). The following are brief explanations of each of the survey methods summarised in Table 5.6.

### *Mail and Self-administered Questionnaires*

In this type of survey, questionnaires are sent directly to respondents and it is by far the cheapest type of survey (Neuman 2000). In the past, this type of survey was conducted primarily via the postal system, but with improvements in technology, and the availability of email and the World Wide Web, questionnaires can now be administered electronically. This type of survey can therefore enable the targeting of very large samples either locally or over much wider geographical areas. This type of survey also offers the greatest level of anonymity, as there is no direct contact with respondents. This lack of direct contact also has the added advantage of eliminating interviewer bias (Neuman 2000).

On the down side, response rates can be low due to a number of factors including self selection where respondents choose whether to participate or not (Sekaran 2000). Further, the possibility exists that the person who eventually completes the questionnaire may not be the targeted respondent. Furthermore, the researcher is not able to control the conditions (and the timing) under which questionnaire of completion (Sekaran 2000). Additionally, as there is no direct contact with respondents, there is no opportunity to visually observe reactions to questions nor is the researcher available to clarify questions in need. This eliminates the possibility of asking contingency or probing questions that may elicit further information. In terms of the questionnaire design, this type of survey typically utilises short, close-ended questions with minimal use of visual aids (Neuman 2000).

However, this type of survey is still the most popular and convenient method for model testing and refinement. In this instance, this method was selected as it satisfied the criteria relating to the need to target a large, geographically dispersed sample, in a very limited period.

### *Telephone Interviews*

Telephone interviews are another popular type of survey and may be thought of as a compromise between mail surveys and face-to-face interviews and therefore combine many of the advantages of each type (Sekaran 2000). First in the list of advantages is



the fact that a high percentage of the population can be reached by telephone and this almost guarantees an immediate response (Neuman 2000). However, this also presents the possible disadvantage that it may not always be convenient for the targets to respond to questions, but if necessary, response rates may be improved through call-backs (Neuman 2000). Although short, close-ended questions are used, an opportunity exists for the interviewer to ask more probing questions. Naturally, this type of survey tends to be more expensive than a mail survey. In addition, the interview periods must be short as it may not be convenient or cost effective to hold long interviews over the telephone. This type of survey also reduces the level of anonymity and does present an opportunity for interviewer bias. Lastly, the use of visual aids is precluded from this type of survey (Neuman 2000).

Given the foregoing disadvantages and in particular the two key issues of cost and anonymity, this type of survey was deemed inappropriate for the second part of this research project.

### *Face-to-Face Interviews*

This type of survey has the distinct advantage of providing the highest response rate compared to the other two types. In addition, this type of survey has all the advantages of telephone interviews and with the added advantage of allowing for longer interview periods. This feature therefore provides the opportunity to ask all types of questions including very complex questions that could not otherwise be asked in a (brief) questionnaire. Further, the face-to-face interview is the only survey type that allows the interviewer to observe both the respondents in their element and their reactions to the questions posed (Neuman 2000). However, this survey type does have the disadvantage of having the highest cost, particularly with large samples, in that interviews may need to be conducted by a number of researchers who may require to be paid some form of allowances including travel, food, accommodation to name a few. Further, because of the face-to-face nature of interviews, this type of survey introduces the highest level of bias where characteristics such as appearance, tone and voice in either the interviewer or respondent may influence: a) how respondents answer questions or b) how the

interviewer interacts with respondents and c) how the researcher interprets the resultant data (Neuman 2000).

Despite its advantages, and like telephone interviews, the face-to-face interview type survey was also deemed inappropriate for the final stage of this research project.

## **5.6 Chapter Summary**

This chapter discussed the issues and presented arguments behind the selection of the research methods utilised in this research. The chapter began with a detailed overview of the foundations of IS research, the Positivist and Interpretivist paradigms other factors that have influenced the growth and development of IS research. In addition, a comprehensive discussion of qualitative and quantitative techniques, including appropriate examples, was presented together with a summary of research methods and their characteristics to demonstrate the rigour in the selection of the research methods utilised in this research. Discussions relating to the issue of context regarding its emerging importance and its relevance to research into the IS investment and organisational performance relationship then followed.

Briefly, the first method selected for this research was Case research and it was to be used to develop the conceptual model. This method was selected for a number of reasons. First, the issues under investigation involved a highly unstructured and complex phenomenon. Second, there was no intention by the researcher to interfere/interact with the phenomenon. Third, the criteria for the selection of a research technique were predicated on the following needs, inter alia: a) to build theory, b) to ensure that issues of context are understood, c) to contribute to knowledge, and d) to ensure that the findings are generalisable.

The second method selected was the Survey method. Specifically, the type of survey method selected was the self-administered short (close-ended) question type of questionnaire delivered by mail (postal and electronic) to a sample of respondents. The survey was developed and applied in line with recommendations in the research literature that suggest the use of such a method to facilitate further testing and refinement of a theory/model.

The use of multiple methods in research in general and IS research in particular is an approach that is fast gaining popularity. Generally, it is anticipated that selecting and utilising research methods that complement each other will result in more robust and valid models and hence yield results that are more reliable and have greater generalisability in both research and practice. In particular, the pluralist approach was deemed to be of great utility to studying the relationship between IS investment and organisational performance given the complexity of the issues around this topic and was thus envisaged to contribute significantly to the development of knowledge in this field of IS research.

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# 6.0 Research Design

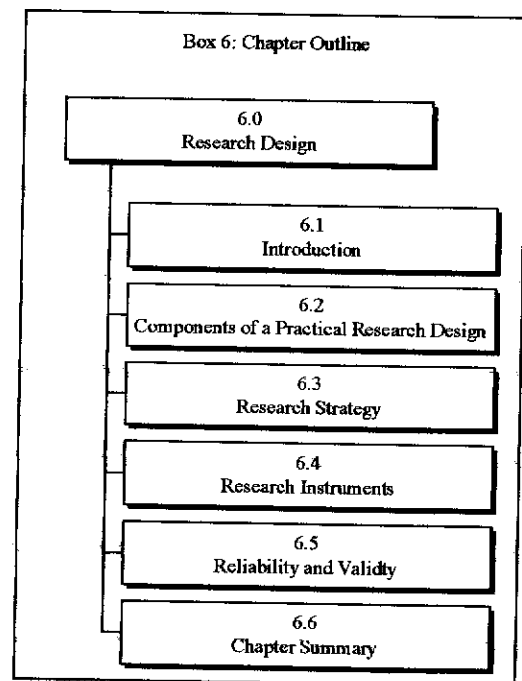
*"In the most elementary sense, the design is the logical sequence that connects the empirical data to a study's initial research questions and, ultimately, to its conclusions."*

*Yin (1994, p19)*

## 6.1 Introduction

This chapter discusses and describes the development the research strategy utilised to conduct this research. The research methods, instruments and the accompanying analytical strategies are also presented together with the arguments for their suitability to this research. In so doing, this chapter demonstrates how the principles of sound research design were meticulously applied in this research to yield robust results and thus contributed to the growth of knowledge in this field of IS research.

Section 6.2 presents and discusses issues relating to the components of a sound and practical research design and demonstrates how these issues were incorporated into the research strategy. The section begins by revisiting the research questions and then progresses to outline the propositions relating to the research questions, followed by discussions relating to the units of analysis, the logic linking the data to propositions and analytical methods.



Section 6.3 presents the research strategy proper. The section begins outlining the research framework upon which the research strategy is based, followed by a thorough discussion of the actual research strategy and a detailed description of how the research strategy was developed from the original framework.

Section 6.4 describes the development of the research instruments utilised in this research strategy. As the research strategy utilised two research methods, both instruments are described in detail. Section 6.5 discusses issues around reliability and validity in both the research strategy and its associated instruments. The chapter then concludes with a summary highlighting the key features of the research design.

## **6.2 Components of a Practical Research Design**

Yin (1994), identified the five components that comprise a practical research design as:

1. The research questions upon which the study is based.
2. The study's propositions (derived from the research questions).
3. The study's unit(s) of analysis.
4. The logic that links data and propositions.
5. Criteria for interpretation of the research findings.

The above components were applied to the development of the research design utilised in this research project and will be discussed in the following sub-sections (6.2.1 – 6.2.5) to demonstrate how these components were embedded into the research design and thus show its strength and rigour.

### **6.2.1 Research Questions Revisited**

The first component of a practical research design is the statement of the research question(s). As the research questions have been already been presented in Chapter 1, they are merely restated here. The primary question that this research sought to address was:

1. How are IS investments and organisational performance related in Financial Institutions?

Secondary questions to this research problem were:

2. Do some components of a FI's IT portfolio contribute more to organisational performance than others and if so, how?
3. How does the role of management affect the IS investment and organisational performance relationship?
4. How does organisational performance affect IS investment levels?
5. Is there a 'threshold' for the level of investment in IS for FIs?

As suggested by Eisenhardt (1989), Yin (1994) and Sekaran (2000) and as discussed in Chapter 5, the choice of research method should be dictated by both the research questions and the purpose of an intended research project. In this instance, the primary research question sought to clarify the relationship between IS investment and organisational performance through the development of a conceptual model that seeks to expound on the 'how' (and possibly the 'why') of this relationship (Chapter 3). This approach was prompted by the recognition of an apparent lack of (and resultant need to build) theory around this very important issue (Chapter 2).

### **6.2.2 Propositions**

The second component of a practical research design is the set of propositions relating to the research problems. To elaborate, Yin (1994) identified two general analytic strategies that can be employed in analysing case data:

1. The use of theoretical propositions.
2. Developing and using case descriptions.

According to Yin (1994), the first strategy is the more commonly used and preferred, wherein one or more propositions are put forward which encapsulate the objectives of the research and influence the data collection/analysis. The second strategy relies on the development of a descriptive framework from the Case research. Although the latter is the less preferred strategy, it nevertheless does represent a viable alternative in the absence of predefined propositions.

Yin (1994) therefore recommended the use of propositions as an analytic lens that enables the researcher to more clearly state the problem at hand and thus facilitate the development of the research design. Applying the foregoing logic to this research project resulted in the derivation of five propositions, one for each of the four components of the conceptual model and one for Context. This tactic enabled the researcher to more clearly focus on issues relating to each component that required elucidation in the context of the overall relationships between the five components (Yin 1994). Thus, the following propositions were put forward:

Proposition 1 – IS investment

*An organisation's IS investment contributes positively to its performance. The level of IS investment is best described by the organisation's IT portfolio, which comprises of Infrastructure, Transaction (Core) Processing Systems and Management Information Systems/Decision Support Systems.*

Prior research in this area provides what is at best conflicting and at worst contradictory (and thus somewhat perplexing) results as to the contribution of IS investments to organisational performance (Chapters 2 and 3). Further, it has been frequently observed that there is a belief amongst senior management that IS costs are too high with little or no discernible benefit (Peppard and Ward 1999; Seddon, Graeser and Willcocks 2002). Despite these apparent negative views of the contribution of IS investments, some studies have been able to show that organisations do benefit from their IS investments (Weill 1992; Kivijarvi and Saarinen 1995).

An excellent example of this debate was provided in The Australian March 1 2002 wherein the CEO of a large Australian Bank claimed that IT “had failed to deliver on promised productivity improvements”. Despite this statement, the same CEO (within the same article) was quoted as saying that a particular contract, purported to have *failed* to meet performance targets, was in fact “*running to expectations*” (emphasis added) and had delivered a 30% reduction in cost. In a later report, (The Australian March 13 2002), the same bank announced the launch of a major IS project (figures

not disclosed). *This apparent contradiction appears to be prevalent both in practice and academic literature.*

In addition, some of the literature describes what appears to be an almost intuitive belief within management that IS contributes positively to performance (Dos Santos 1991). The problem therefore lies in being able to demonstrate this contribution and subsequently being able to (potentially) isolate the contribution of various components of the IT portfolio. Therefore, the conceptual model seeks to clarify this contribution.

*Proposition 2 – Organisational performance*

*An organisation's performance can be described both by:*

- a) External indicators (Key Performance Indicators) acceptable at an industry level. These measures may form a basis for comparison with other organisations competing in the same sector.*
- b) Internal indicators (Key Performance Indicators) that may be unique to that organisation. Management use these standards to determine performance at various levels (individual, group or entire organisation).*

The importance of measurement to the practice of management in general and IS management in particular is indisputable (Saunders and Jones 1992; Pitt, Watson and Kavan 1995). However, the debate usually arises as to *what* should be measured and *how* (Scudder and Kucic 1991; Mahmood and Mann 1993). The same is true for organisational performance, which it may be argued, can be measured from two perspectives, either internal or external to the organisation (van Nievelt 1999; Sethi, Hwang and Pegels 1993). Further, observations have shown that most measures used to measure organisational performance tend to be quantitative and only a few are qualitative (Chapter 2). This may be due to the fact that IS professionals and researchers favour quantitative measures because of: 1) their long tradition of use in business, 2) they are often easier to use/manipulate and 3) they generally tend to



have a higher acceptance/credibility (Chan 2000). In fact, it has been noted that the degree of difficulty in use of method often increases as more qualitative issues are incorporated (Renkema and Berghout 1997). In many cases, quantitative measures are reduced to a dollar figure or percentage against some benchmark (Cron and Sobol 1983; Harris and Katz 1989).

This research therefore sought to identify the most appropriate measures, be they quantitative, qualitative or a mixture of both for organisational performance with specific reference to IS investment.

### *Proposition 3 – Managerial Effectiveness*

*Managerial effectiveness defines the role of management and its ability to utilise available resources (including IS investments) in order to achieve set objectives. Good management of IS investments contributes to better organisational performance.*

It is generally accepted that management plays a very important and critical role with respect to IS acquisition and utilisation in organisations (Seddon, Graeser and Willcocks 2002). Banker, Kauffman and Morey (1990) described a construct that they termed the intermediate production process and Harris and Katz (1989) found that organisations that were better managed were more likely to achieve better performance with respect to their IS investments. Weill and Olson (1989) and later Weill (1992) defined and tested what they termed ‘Conversion effectiveness’ as an important factor influencing the IS investment and performance relationship. This research takes into account these important findings and extends the concept of Managerial effectiveness by attempting to verify how this construct is constituted and its effect on the relationship in question<sup>5</sup>.

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<sup>5</sup> Discussed in detail in Chapter 2

*Proposition 4 – Strategic Information Systems Planning*

*Organisations that formulate and implement practical strategic plan(s) for IS are likely to have a stronger IS investment and organisational performance relationship than those that do not (under similar conditions).*

Harris and Katz (1988) observed that firms that invested more in Information Systems tended to perform better than those that did not. However, investing in IS, though necessary, may not be sufficient in improving performance if that IS investment is not properly planned. In fact both the business and IS literature are replete with discussions on the need for strategic planning (Boar 2001). The conceptual model therefore takes suggestions from Weill and Olson (1989) and Earl (1993) as a starting point and works towards defining those issues (factors) that form the primary considerations that need to be taken into account during the SISP process in order to maximise the potential benefits of IS investments.

*Proposition 5 – Organisational Context*

*The context of an organisation will have a marked effect on its IS investment and organisational performance relationship.*

In a review of the literature, Kauffman and Weill (1989) showed that many studies in this field did not explicitly consider context. Kauffman and Weill (1989) surmised that this might have been due in part to the difficulty of quantifying an organisation's context so that it could be manipulated mathematically and concluded that some of the results obtained in earlier studies may not have accurately depicted the relationship between IS investment and organisational performance. Further, Trauth (2001) discussed the importance of context, and the need to consider it in both the development of IS theory and practice of IS management. Given the foregoing, this research therefore seeks to investigate the issue of context and its effect on the relationship between IS investment and organisational performance.

Clearly, these propositions are very closely related as depicted by the relationships and interactions of the conceptual model (Chapter 4). Thus, by using these

propositions, the researcher was better able to articulate the research questions and thus develop a more focussed research design.

### 6.2.3 Units of Analysis

The third component of a practical research design relates to the unit(s) of analysis for the research problem(s). It is essential that the most appropriate unit(s) of analysis is/are selected, as this will directly influence the research design in general, and the data collection/analysis in particular. To illustrate, consider the data collection and method requirements when the unit of analysis is the individual (Lucas 1975a) and compare that to the corresponding requirements when the unit of analysis is the organisation (Banker, Kauffman and Morey 1990). Clearly there will be different requirements in each instance. This discussion on unit(s) of analysis applies equally to both Case and Survey research.

Lucas (1993), in a wide-ranging discussion on this matter, identified six possible levels of analysis at which data could be collected. These are listed in Table 6.1, with accompanying examples of studies that have been conducted at each level.

Unit Of Analysis	Representative Studies
Economic sector	Tam (1998)
Group of firms	Im, Dow and Grover (2001), Mahmood and Mann (1993)
A unit/part of a firm	Weill and Olson (1989)
An industry segment	Harris and Katz (1989), Harris and Katz (1991), Markus and Soh (1993), Sohal and Ng (1998);
Single firm	Banker, Kauffman and Morey (1990)
Individuals/Groups	Lucas (1975)

Table 6.1: Units of Analysis and representative studies

Lucas (1993) therefore noted that in much of the earlier research in this field, differing units of analysis have been used. These have ranged from the individual Lucas (1975), through the business unit (Alpar and Moshe 1990) and the organisation (Sethi, Hwang and Pegels 1993) right up to the level of the economy as a whole (Loveman 1988). Similar observations were made in the meta-analysis presented in Chapter 3.

It may further be argued that this apparent lack of consistency in the selection of units of analysis has contributed greatly to some of the problems regarding generalisability and comparability discussed in Chapters 2 and 3.

Thus, Lucas (1993) argued that designs targeted at an entire economy are most *unlikely* to produce conclusive results whereas those targeted at the organisational level are more *likely* to produce better results. It may be further argued that eliminating or controlling industry effects, as has been the case in some studies such as van Nievelt (1999), has had the net effect of clouding some of the effects of context that could have been a critical determinant in this relationship, hence contributing to the overall inconsistent results observed in the literature. The tactic of eliminating or controlling for industry effects has been attributed to the use of research designs that rely primarily on quantitative analytical techniques, such as the Cobb-Douglas productivity function, which as discussed in Chapter 5, is inappropriate for use with some units of analysis such as at the macroeconomic level.

Consequently, one of the premises for this research was that the IS investment and organisational performance relationship may be best understood by using the organisation as the unit of analysis. With regards the appropriateness of using Case research, Yin (1994) noted that, the definition of a 'case' can vary from an individual to a economy and it is this flexibility of Case research of being able to cope with varying units of analysis that made it an ideal method for this exploratory research project. The unit of analysis for this research was therefore set at the organisational level and multiple organisations would thus be theoretically sampled as potential cases which would enable the development of a chain of evidence, supported by a detailed case database and lead to greater reliability and validity in the results obtained (Miles and Huberman 1994). Ultimately, greater reliability and validity would lead to results that are generalisable and that in turn would lead to the development of a robust model (Eisenhardt 1989).

Case Research

**Matching Units of Analysis and Research Design Type**

After the decision regarding the research methods (Case research and Survey) and the appropriate units of analysis (the organisation) had been reached, an important follow-up consideration was the question regarding the choice between single or multi-case research designs. To make this decision, four possible options for matching research design with units of analysis were reviewed using a typology by Yin (1994). These options are illustrated as a simple 2x2 matrix (Figure 6.1).

	Single Case Designs	Multiple Case Designs
Holistic (Single unit of analysis)	Type 1	Type 3
Embedded (Multiple units of analysis)	Type 2	Type 4

Figure 6.1: Case research design versus Units of analysis (Adapted Yin (1994))

**Single Vs. Multiple Case Designs**

Single case designs involve the use of a single case, such as an organisation or an individual, whereas multiple case designs involve the use of a group of *distinct* cases, such as a group or firms or individuals (Yin 1994).

**Holistic Vs Embedded Units of Analysis**

Holistic units are units that are considered at the broad and general level. Using the examples in the preceding discussion on single/multiple designs, an organisation when considered as a single unit at the broad/general level is a holistic unit. The same would apply for an individual. Embedded units on the other hand are units of analysis that are considered at a more specific and detailed level. In other words if

one were to use the example of an organisation, its departments (or the individuals within them for that matter) could form embedded units of analysis.

After careful consideration of the above options and in order to enhance the reliability and validity of results and to allow for cross-case analyses, it was decided to use several organisations within an economic sector, the Australian FSS (Chapter 2).

Thus, using Yin's (1994) typology in Figure 6.1, the most appropriate match for this research was deemed to be Type 3, *multiple case designs using single (holistic) units of analysis*.

#### **6.2.4 Logic Linking Data and Propositions**

The fourth component of a practical research design relates to the logic that links data to the propositions and hence the research question(s). Essentially, this component defines and describes the analytic strategy(ies) utilised within the research strategy and is therefore an important and critical part of the overall research design (Yin 1994). In Case research, the analytic strategies are contained within the case study protocol together with the research instrument and by developing the protocol prior to conduction data collection and analysis, the researcher is forced to consider all issues pertinent to the research objectives and how best to attain these objectives (Pare 2001).

As discussed earlier, this research utilised two research methods. The model development and testing activity utilised Case research and the model refinement activity utilised Survey research. Consequently, a number of analytic methods were considered as suggested by Miles and Huberman (1994), Yin (1994) and Sekaran (2000). For the Survey, quantitative (statistical) data analytic techniques were utilised whereas the Case research relied primarily on qualitative data analytic techniques. Yin (1994) separates qualitative analysis techniques into two categories: dominant modes of analysis (Table 6.2) and lesser modes of analysis (Table 6.3). These are discussed in the following sub-sections.

### Case Research

#### **Dominant Modes of Analysis**

One of the strengths of Case research is its ability to incorporate a variety of analytic techniques. Yin (1994), identified the following dominant modes of analysis:

1. Pattern matching – this analytical technique can be used to identify either dependent or independent variables. As an example, two types of pattern matching techniques that could be used are:
  - a. Dependent variables are identified using a quasi-experimental design known as ‘non-equivalent dependent variables design’ where a variety of outcomes may have been obtained in a given situation and the researcher attempts to analyse the situation.
  - b. Independent variables are identified using ‘rival explanations as patterns’, i.e. a number of cases may have had similar outcomes and explanations are developed as to why this may be so.
2. Explanation building – similar to pattern matching, this technique enables the researcher to develop a narrative of a phenomenon by searching for a series of casual links in the cases. The narrative is built through a series of iterations during which the explanation is modified after each case until saturation is attained.
3. Time-Series analysis – enables the researcher to develop a case study by analysing a phenomenon over time. Techniques used in this category include simple time series, complex time series and chronologies.
4. Program-Logic models – combination of techniques that uses time-series analysis and pattern matching, where pattern matching is used to identify cause/effect patterns between independent and dependent variables and time series analysis identifies that chain of events that surround the phenomenon.

For this research, the pattern matching and explanation building techniques were selected as the dominant modes of analysis with some time series analysis being conducted to identify any trends in the cases over time. This selection was on the basis that the data that was to be collected via the Case research instrument was best

suiting to these two analytical techniques. Both of these methods were incorporated into a qualitative data analysis process derived for this research as discussed in Section 6.3.4.

Table 6.2 summarises the preceding discussion of dominant modes of analysis for comparative purposes (Miles and Huberman 1994; Yin 1994).

Analytic Strategy	Example Techniques	Purpose/Objective
<b>Pattern Matching</b>  (In explanatory/ exploratory cases patterns are related to independent and/or dependent variables)	Identifying non-equivalent dependent variables  Developing rival explanations (for independent variables)	Compares a derived pattern or several alternatives with a predicted pattern
<b>Explanation Building</b>	Similar to pattern matching techniques	Analyse Case research data by building an explanation about it. The elements of explanations (variables) are identified through an iterative process. As a result Rival explanations are developed until a general explanation is built that fits each of the cases.
<b>Time Series</b>	Simple Time Series Complex Time Series Chronologies	Techniques set out to match a trend of data points to a given explanation or its alternate/rival.
<b>Program Logic Models</b>  (More applicable to explanatory/ exploratory than descriptive case studies)	Combination of pattern matching and time series analysis	Specifies a chain of events (pattern) over time (time Series) that covers identified independent and dependent variables.

Table 6.2: Dominant modes of analysis (Adapted (Yin 1994))

### Lesser Modes of Analysis

Table 6.3, summarises the lesser modes of analysis that may be applied in Case research. Though considered, none of these methods were specifically adopted for this research, but are presented here for completeness.

Thus, and as shall be demonstrated later (Chapters 7 and 8) this research successfully utilised the dominant modes of analysis to interpret data gathered through the



application of the Case research method on a set of theoretically sampled FIs in the Australian FSS (Neuman 2000; Sekaran 2000).

Analytic Strategy	Example Techniques	Purpose/Objective
Repeated Observations	All forms of observation	Mainly cross sectional when observations are made at repeated sites, but can be considered a special type of time series when observations are made over a period of time.
Case Survey	Close ended instrument applied to each case	Cross-case analytic strategy used for secondary analysis of a given issue(s) across a series of cases
Analysing Embedded units	Survey Analysis Economic Analysis Operations Research Historical Analysis	Adopted technique reflects propositions at a micro level whilst bearing in mind the macro case in question

Table 6.3: Lesser modes of analysis (Source: Yin (1994))

The analysis was executed in a series of iterations at three levels until saturation was attained. First, for each case (credit union or commercial/retail bank), a complete case report was prepared that included a case description and a case analysis (Chapters 7 and 8). Secondly, at each level of industry, (credit union or commercial/retail banking), cross-case analyses were undertaken (Chapters 7 and 8). Last, but not least, the third level involved cross industry comparison between the credit union and commercial/retail banking industries (Chapter 10). This tactic for within-case, cross-case and cross-industry analyses is illustrated in Figure 6.6 and was designed to provide a comprehensive and clear picture of IS investment and organisational performance in the Australian FSS.

### 6.2.5 Criteria for Interpreting Findings

This is the last component of a practical research design as recommended by Yin (1994). Whereas determining the criteria for interpreting research findings for survey research is perhaps a lot more straightforward as statistical tests can easily be applied when interpreting quantitative data, qualitative data on the other hand does not lend itself well to that form testing, hence the criteria in that situation would be very much dependent on the researcher (Yin 1994). This aspect of qualitative data has been

acknowledged in the literature and was noted in this research design in so far as it related to the Case research phase of the project (Galliers 1990).

In summary therefore, the preceding discussion (Section 6.2) has provided a thorough and comprehensive description of the theoretical issues and practical considerations around developing a robust and practical research design. The discussion now turns to the application of these concepts in the actual development of the research strategy for the execution of this research project.

### **6.3 Research Strategy**

In all academic and practical enquiry, there is a need for the researcher to have a strategy that acts as a framework for the execution of a given research project. In the sciences, research strategies are typically structured processes that have been tried and tested many times and over an extended period. Consequently, it is expected that if one were to apply those processes to a given problem, the results obtained would in each case be similar, if not identical. This characteristic allows for repeatability in method and contributes greatly to the validity and generalisability of said results (Sekaran 2000).

However, when one tackles an unstructured problem such as the one under consideration and the phenomenon is such that scientific methods may not be appropriate, it is necessary to develop an appropriate process with which to conduct the enquiry. This 'process' is what is termed the research strategy (Pare and Elam 1997; Cavaye 1996). Developing a unique research strategy has the singular advantage that it enables the researcher to adopt and adapt the most suitable research methods to understanding the phenomenon in question (Eisenhardt 1989).

After careful consideration of the research questions, it was concluded that there was a very strong need to conduct an exploratory study and develop a conceptual model (Chapter 3) that would contribute to building theory and thus enhance knowledge of the IS investment and organisational performance relationship. Thus, the strategy employed in this research was an adaptation and extension of an earlier framework by Eisenhardt (1989). As alluded to earlier in this section, there are a number of

advantages that arise out of utilising established and known frameworks because of their stronger external validity (Sekaran 2000).

The following sub-sections discuss the features of the Eisenhardt (1989) framework in to demonstrate its suitability to this type of exploratory research. This discussion is then followed by a detailed explanation of the modified framework developed for this research. As shall be demonstrated, the resultant research framework was very thorough and highly flexible, as it was developed to tackle a complex and unstructured problem. To simplify and facilitate explanation, the research strategy is presented sequentially, in the order in which the phases were executed, with each phase being discussed in terms of the tasks/activities undertaken therein.

### 6.3.1 Original Research Framework

Figure 6.2 illustrates the original research framework as proposed by Eisenhardt (1989).

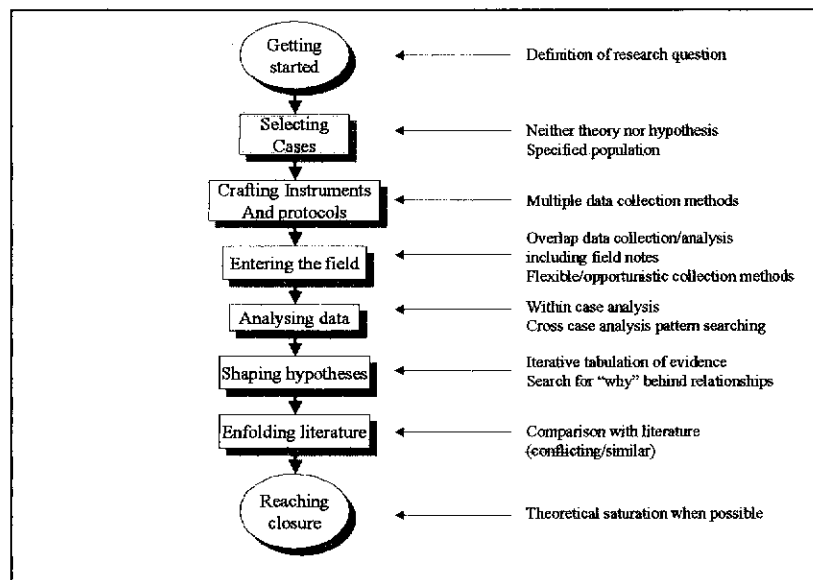


Figure 6.2: Original research framework (Eisenhardt 1989)

Table 6.4 summarises the features of the framework illustrated in Figure 6.2. Thus, the actual research strategy utilised in this research was an extended version of the framework illustrated in Figure 6.2 and is presented in Section 6.3.2.

Stage	Activity	Reason
Getting started	<ul style="list-style-type: none"> <li>• Define research question(s)</li> <li>• Possible a priori constructs</li> </ul>	<ul style="list-style-type: none"> <li>• Focuses efforts</li> <li>• Provides better grounding of measures</li> </ul>
Selecting cases	<ul style="list-style-type: none"> <li>• Neither theory nor hypothesis</li> <li>• Specified population</li> <li>• Theoretical sampling</li> </ul>	<ul style="list-style-type: none"> <li>• Retains theoretical flexibility</li> <li>• Constrains extraneous variation and sharpens external validity</li> </ul>
Crafting instruments and protocols	<ul style="list-style-type: none"> <li>• Multiple data collection method</li> <li>• Qualitative and quantitative</li> </ul>	<ul style="list-style-type: none"> <li>• Triangulation strengthens grounding of theory</li> </ul>
Entering the field	<ul style="list-style-type: none"> <li>• Iterative data collection and analysis</li> <li>• Flexible opportunistic data collection</li> </ul>	<ul style="list-style-type: none"> <li>• Speeds analysis</li> <li>• Facilitates emergent themes</li> </ul>
Analysing the data	<ul style="list-style-type: none"> <li>• Within-case</li> <li>• Cross case analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Builds familiarity with data and facilitates preliminary theory generation</li> <li>• Looks beyond initial impressions</li> </ul>
Shaping hypothesis	<ul style="list-style-type: none"> <li>• Iterative tabulation of evidence for each construct</li> <li>• Replication logic across cases</li> <li>• Search for the cause, ie the 'why' behind relationships</li> </ul>	<ul style="list-style-type: none"> <li>• Sharpens construct definition, validity and measurability</li> <li>• Confirms, extends and sharpens theory</li> <li>• Builds internal validity</li> </ul>
Enfolding the literature	<ul style="list-style-type: none"> <li>• Comparison with conflicting literature</li> <li>• Comparison with similar literature</li> </ul>	<ul style="list-style-type: none"> <li>• Builds internal validity, raises theoretical level and sharpens construct definition</li> <li>• Improves generalisability, raises theoretical level and sharpens construct definition</li> </ul>
Reaching closure	<ul style="list-style-type: none"> <li>• Theoretical saturation</li> </ul>	<ul style="list-style-type: none"> <li>• Ends process when marginal improvement becomes small.</li> </ul>

Table 6.4: Research strategy for conducting Case research (adapted: (Eisenhardt 1989))

Although the original framework, as described in Table 6.4, was comprehensive, modifications to that framework were deemed necessary to adapt what was primarily a single method (Case research) framework to suit a pluralist (multi-method) research strategy. Further, in the process of selecting the most appropriate research framework, an alternative framework as suggested by (Yin 1994) was also considered. However, after careful and deliberate consideration, the Eisenhardt (1989) framework was selected as it was deemed best suited to the objectives of this research project that included the development of a model that is “*novel, testable and empirically valid*” (Eisenhardt 1989, p532).

### 6.3.2 Actual Research Strategy

Using the original framework by Eisenhardt (1989) as a template, a modified research strategy was developed that enabled the researcher to apply both Case and Survey research methods to develop and test a conceptual model of the IS investment and organisational performance relationship. The modified research strategy is illustrated in Figure 6.3.

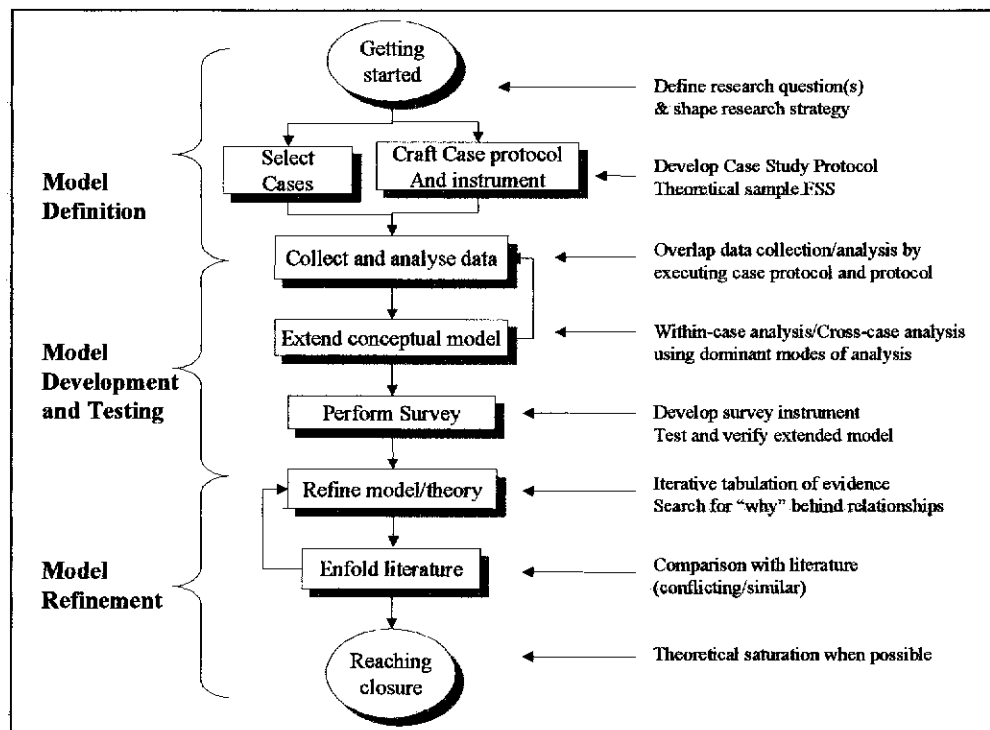


Figure 6.3: Actual research strategy utilised in this research

It is worth noting that, in addition to utilising the original framework by Eisenhardt (1989), other recommendations and guidelines by renowned Case researchers such as Miles and Huberman (1994) and Yin (1994) regarding the development of a practical research design/strategy were also taken into account.

#### Summary of Modifications to Eisenhardt Framework

The following modifications were made to the original research strategy:

- 1) The research strategy was divided into a three-phase research process executed in the period from February 2001 to July 2004 inclusive. The

resultant was a highly structured strategy consisting of three phases: 1) Model definition, 2) Model development and testing and 3) Model refinement. Each phase consisted of a number of tasks and activities as discussed in Sections 6.3.3 to 6.3.5 and as shown in Appendix 2-1, Table A2.1.

- 2) The original framework suggested a sequence of tasks beginning with case selection and then followed by the development of a research protocol prior to entering the field. Although practical, it was found to be expedient to conduct these two activities in parallel prior to data collection/analysis (Figure 6.3). In addition, any time saved could later be re-allocated to the data analysis stage (Miles and Huberman 1994).
- 3) In the modified strategy, 'entering the field' was not explicitly stated as an activity, but was implicitly part of the 'collect and analyse data' activity, the final activity of phase one. In the modified research framework, this task can be iteratively executed with the 'extend conceptual model' task (first task of phase two) as it expedites both analysis and identification of emergent themes (Eisenhardt 1989).
- 4) The original framework was modified to allow for the execution of a survey in phase two that was to facilitate preliminary testing/refinement of the conceptual model. This was considered a major modification to the original framework as it consequently enabled the framework to accommodate the use of more than one research method. This aspect was anticipated to greatly enhance, and thus contribute significantly, to the reliability and validity of the conceptual model and follows recommendations discussed in Chapter 5 on the adoption of a pluralist approach to IS research for more complete results.
- 5) The last modification to the research strategy was the explicit iteration between the last two tasks in phase three to further strengthen the external validity of the conceptual model (Figure 6.3).

It is argued here that these modifications were necessary to ensure that the best results were obtained. Adding these modifications resulted in a more rigorous and clearer research strategy and thus made it more appropriate for this research.

Appendix 2-1 illustrates a simple Gantt chart for the research project and serves to provide an indication of the time taken to execute each phase and the overall time taken to conduct this research. The following sub-sections (6.3.3 – 6.3.5) provide a detailed description of the three phases of the modified research strategy.

### **6.3.3 Phase 1: Model Definition**

In this phase, the deliverables were a clear problem statement and the proposition of the conceptual model. The following activities were undertaken to achieve these deliverables:

1. Comprehensive review and meta-analysis of the literature on the relationship between IS investment and organisational performance.
2. Definition of conceptual model.
3. Crafting of protocol and instruments.
4. Establishment of initial contact with focal industry.

#### *Review and Meta-analysis of the Literature*

These activities were an integral part of the research project and although listed as a phase one activity, the literature in particular was in fact continuous throughout the research project. The literature review (Chapter 2) formed the theoretical basis for the development and refinement of the research questions and conceptual model. In addition to the literature review, a meta-analysis of the IS investment and organisational performance literature was conducted (Chapter 3). These two activities were critical to identifying weaknesses in earlier research and strengthening arguments for the significance and importance of this research, including the need for better and more reliable models of the IS investment and organisational performance relationship.

### *Definition of Conceptual Model*

The definition and proposal of the conceptual model is reported in Chapter 4. Briefly, the process involved a number of aspects and tasks, including:

- Practical experience within the discipline of IS and the FSS.
- The aforementioned comprehensive review of relevant literature and meta-analysis (Chapters 2 and 3 respectively).
- Investigation and search for appropriate research methods.
- Consultation with academics and key players within the industry. For example, at an early stage of the research project, the conceptual model was discussed with the CEO of an FI in order to obtain feedback as to the relevance of the model to practice and to obtain some indication as to the viability of the research project. On both counts, feedback was extremely encouraging and contributed to the development of the conceptual model.

The conceptual model formed the basis upon which the research was conducted and provided the framework against which data were analysed.

### *Crafting of Protocol and Instruments*

The use of a case study protocol is crucial to the proper execution of Case research (Yin 1994). The protocol utilised in this research outlined the procedures and rules that governed the conduct of the researcher and the execution of the research project. It also contained the research instrument that was used to collect (primary) data from the cases.

The Case research instrument was a highly structured and detailed guide for conducting interviews in selected organisations that consisted of open-ended questions directed towards establishing the main components of the conceptual model (Section 6.4.2). The Survey instrument on the other hand, was also a highly structured instrument that utilised short, close-ended questions. The survey instrument was developed to facilitate further testing and verification of the individual components of the conceptual model (Section 6.4.3).



In addition, the case study protocol also identified secondary data that was to be collected to support primary data collected via the interviews. Further, the case study protocol contained guidelines for qualitative data analysis including outlines of the qualitative content analysis, ‘within-case’, ‘cross-case’ and ‘cross-industry’ analytic processes discussed in Section 6.3.4 (see also Chapter 5).

Sample Selection

**Case Selection Criteria**

Theoretical sampling was undertaken to select suitable organisations from a population of Australian FIs (Eisenhardt 1989). Table 6.5 summarises the cases selected for this study.

FEATURE	CUC1	CUC2	CUC2	PC1	CRB1	CRB2
Industry	Credit union	Credit union	Credit union	Commercial/Retail bank	Commercial/Retail bank	Commercial/Retail bank
Ownership	Australian	Australian	Australian	Australian	Australian	Australian
Primary market	State	State	National	National	National	National
Size	Small	Medium	Medium	Medium	Large	Large
IS Function	None	Yes	Yes	Yes	Yes	Yes
Number of participants	2	4	3	3	3	3

Table 6.5: Cases selected for IS investment and organisational performance research in the Australian FSS

Cases were drawn from FIs that undertake general retail (and commercial) banking activities within the FSS<sup>6</sup>. This category was chosen primarily because of its size within the Australian FSS and which therefore provided a very large population from which to choose from. In addition, cases were selected to facilitate comparisons between similar FIs operating within a given industry. Last but not least, ease of access was also considered as this would impact on the costs incurred during the execution of the research project.

<sup>6</sup> For confidentiality purposes, each case was assigned a code. This ensured that none of the cases would be identifiable and preserved anonymity in the reporting of cases.

The specific steps undertaken to select potential participants will now be described.

### **Step 1 – Identify Target Industry**

The FSS in Australia was selected as the target industry based on a thorough review of the literature and a detailed meta analysis that both showed an apparent lack of research in the FSS in general and even fewer studies in the Australian context in particular (Chapters 2 and 3).

### **Step 2 – Theoretically Sample Population**

The FSS in Australia has a large population of FIs in diverse industries ranging from General Insurance, through Superannuation to Authorised Deposit-taking Institutions (ADIs). Given the large population and diversity of FIs, it was decided to limit the scope to ADIs. Within this category, the research focus was further narrowed to credit unions and commercial/retail banks. A minimum sample of three credit unions and three commercial/retail banks was required as per the case study protocol to facilitate within-case and cross-case analyses (with industry and across industries). This was in line with recommendations by Eisenhardt (1989), who suggested that, for multiple case designs, a sample size of between four and ten cases is a manageable number, so that the volume of data does not overwhelm the researcher.

Initially, a total fifteen (15) FIs were contacted, (four (4) Credit Unions and eleven (11) commercial/retail banks) in three different state capitals. Of these, seven (7) responded and agreed to participate. One of these cases was treated as a pilot case. However, one of the commercial/retail bank cases later opted to withdraw from the study, citing pressing commitments, and this left a net of six (6) cases in the final sample of FIs in the Australian FSS.

In each case, three participants were nominated for and participated in the interviews as per the research design. These were, the Chief Executive Officer (CEO), the Chief Financial Officer (CFO) and the Chief Information Officer (CIO), or suitable proxies.

### **Step 3 – Establish Initial Contact with FIs**

Prior entering the field to collect data in each organisation, contact was established with target organisations as directed by the case study protocol (Section 6.4.2). In each case, the initial contact was informal and took the form of a meeting with the Chief Executive Officer or designated contact within each organisation. During this first meeting, an overview of the research project, its objectives and proposed outcomes were discussed. In addition, potential participants were identified. This was later followed up by a more formal request via e-mail or letter.

Once agreement to participate had been secured, interviews were scheduled as per the case study protocol. In each instance, interviews were approximately 60 – 90 minutes in duration. A key constraint in designing the interview questionnaire was the fact that targeted participants were executives with very busy schedules and could therefore not afford to have lengthy and/or repeat interviews. To facilitate, the process of communication with each FI, a representative was nominated from each FI who acted as liaison between the researcher and the organisation.

### **Survey Sample Selection**

Unlike the Case research part of the research project, a relatively large sample was required for the preliminary testing of the conceptual model via survey. However, the survey sample was still drawn from the total population of Australian Authorised Deposit-taking Institutions (ADIs).

#### **6.3.4 Phase 2: Model Development and Testing**

In the second phase, the conceptual model was further extended and developed using data collected from the cases. Activities in this phase were:

1. Data collection via Case research instrument
  - a. Pilot case
  - b. Credit union cases

c. Commercial/retail bank cases

2. Data analysis and extension of conceptual model
3. Testing of conceptual model via survey instrument

The following sub-sections describe these activities in more detail to demonstrate how this critical phase of the research strategy was executed.

Data Collection

The next, task as outlined by the research strategy, was ‘data collection and analysis’ (Figure 6.3). Two separate data collection tasks were executed, one for Case research and one for the Survey.

In the first instance (Case research), data collection began as soon as was possible after interviews had been scheduled and confirmed by the liaison in each FI. Data collection was performed with two key objectives for analysis in mind:

1. Triangulation of data from multiple sources.
2. Triangulation of perspectives from multiple participants.

Primary data was collected utilising the Case research instrument. As alluded to earlier, at least three participants were interviewed in each case. These were the CEO, CFO and CIO. In each case, interviews were recorded and later transcribed. In addition, field notes were made based on observations in each case. In addition, significant amounts of secondary data, including but not limited to, financial reports, IS investment data, industry statistics and non-financial data from a variety of sources was collected as per the pre-defined data schema (Appendix 2-2).

To facilitate data collection, all interviewees were provided with a copy of the research instrument prior to their scheduled interviews. This was done for three reasons. First by previewing the questions, participants were not surprised or made uncomfortable by any of the questions. Second, familiarising participants with the interview questions enabled them to have some forethought on the questions and thus provide quicker and better answers during the actual interview than would otherwise

be the case and hence led to a more efficient data collection process. Third, the two foregoing reasons combined contributed to managing the time constraint by ensuring smoother interviews.

In addition, each individual FI's liaison was provided with the secondary data schema prior to the interviews so that they could compile, collect and collate this data for the researcher. Again, this was designed to save time. In practise however, this was not always the case and extensive follow-ups had to be conducted and in some cases it took several weeks after the primary data collection had been completed to finalise secondary data collection.

The cases were engaged sequentially, beginning with the pilot case in early July 2001, with the last case study being completed in November 2003. As data collection was completed in each case, analysis commenced immediately thereafter. Consequently, data collection and analysis for the cases was conducted in parallel as per the case research strategy.

### Case Research

#### **Pilot Case**

The pilot was conducted in an actual field setting. It should be noted here that a 'pilot case' is by nature different to the typical pilot study conducted in methods such as Survey. In a Survey, for instance, the purpose of a 'pilot study' is to *pre-test* the research instrument. In Case research however, the pilot case is used "*formatively, assisting the investigator to develop relevant lines of questions – possibly even providing some conceptual clarification for the research design as well.*" (Yin 1994, p74).

Yin (1994) suggests a number of conditions under which a case might qualify as a pilot. These include, but are not limited to: convenience, location to researcher, congeniality and accessibility of participants. In this instance, the foregoing conditions were all apparent in the FI chosen as the pilot which was a medium sized commercial/retail bank operating in one of the states in Australia.

Van Teijlingen and Hundley (2001) further discuss the use and importance of pilot cases and highlighted the following advantages of using pilot cases:

- Determining the feasibility of the study
- Determining resources required for the study particularly during data collection
- Refining research protocols
- Testing and developing research instruments
- Gauging the reliability and validity of research protocols
- Providing a training/practice run for the researcher(s)
- Establishing effectiveness of sampling frame and technique
- Identifying possible logistical problems that might impede data collection/analysis
- Assessing and verifying proposed data analysis techniques

The foregoing points were all considered applicable in this case and were incorporated into the research design.

Thus, the case study protocol was applied to the pilot case under normal data collection conditions, i.e. three 90-minute interviews were scheduled and conducted successfully. It was noted that apart from the wording of one question in the Case research instrument (interview guide) regarding the issue/impact of organisational politics (in the Managerial effectiveness section of the research instrument), feedback from the participants indicated that:

1. The structure of the questions was appropriate.
2. The length of the interviews was acceptable.
3. The questions were reasonable.
4. Proposed conceptual model was both intuitive and appeared to have practical significance/application.

Getting this feedback was a critical deliverable of the pilot case and engendered a high level of confidence in the overall suitability/practicality of the research design including the case study protocol and research instrument. Further, the feedback also confirmed arguments (presented in Chapter 2 and 3) regarding the relevance of this research and the need for a better understanding of the IS investment and organisational performance relationship through the development of appropriate models and theory.

Thus, based on the results of the pilot, data-collection was commenced in earnest for all other cases in the sample.

### **Credit Union Cases**

Three Credit Union cases were targeted, one small, (CUC1) one medium sized (CUC3) and one large sized (CUC2). Data collection was straightforward, conducted according to the protocol and no problems were encountered.

### **Commercial/Retail Bank Cases**

Three Commercial/Retail Bank cases were targeted, one medium (Pilot Case) and two large sized (CRB1 and CRB2). Data collection was straightforward, conducted according to the protocol and no problems were encountered.

### ***Survey***

A modified five-step process based on guidelines by Neuman (2000), was used to develop and execute the survey. This process is illustrated in Figure 6.4.

The first step in the process was the development of the research instrument described in Section 6.4.3. The second step in the process involved the selection of the sample prior to data collection. The target population in this study was the total population of Authorised Deposit-taking Institutions (ADIs) in the Australian FSS. Neither random, nor theoretical sampling was utilised. The total population of ADIs

in Australia was small enough that all active ADIs could be included in the sample. The third step involved the mailing of questionnaire packages. Prior to mailing, the instrument was checked and verified by two experts and returned with no corrections.

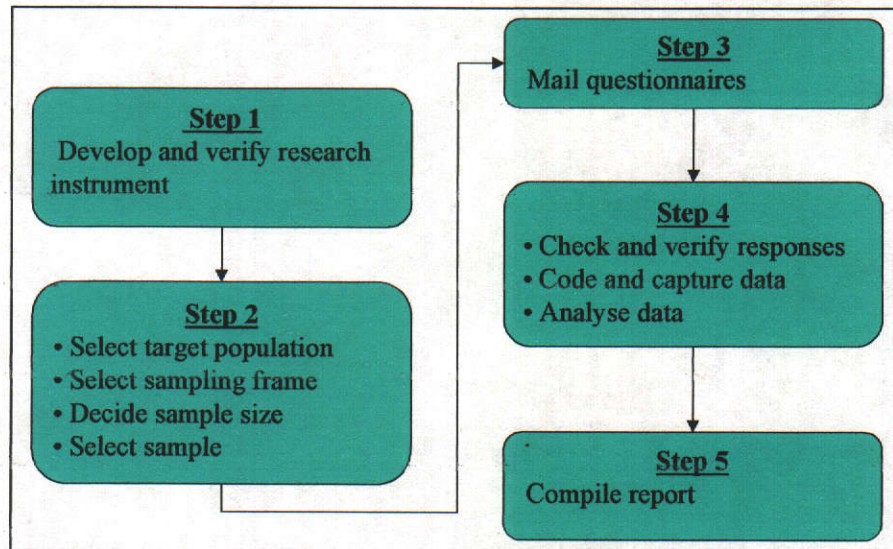


Figure 6.4: Process for carrying out Survey research (Adapted Neuman (2000))

Thus, each participant received a package containing:

1. A participation letter briefly describing the background of the survey, arguments for the survey and assurances regarding confidentiality of data.
2. One copy of the questionnaire.
3. A reply paid envelope with which to return the completed questionnaire.

Respondents were afforded approximately eight (8) weeks in which to complete and return the questionnaires. In addition, a number tactics were employed to improve the response rate as discussed in Chapter 9 (Neuman 2000). Upon receipt of the returned questionnaires, each questionnaire was checked and verified to ensure that it had been properly completed. Coding then followed with analysis being performed using the SPSS statistical package. The findings, including the discussions conclusions and recommendations thereof are reported in Chapter 9.



*Data Sources*

**Case Research**

Table 6.6 lists the data sources for the Case research part of the research project.

Type	Source
Primary Data	Structured interviews
	Contact summary sheets
Secondary Data	Document summary sheets
	Financial reports
	IS budget and other financial data
	Website information
	Industry statistics
	Industry reports
	Internal company documents

Table 6.6: Data sources in Case research

The use of these data sources was determined by the research design and recommendations regarding the conduct of Case research by Miles and Huberman (1994) and Yin (1994).

**Primary Data and Interview Transcripts**

For each of the cases, primary data was collected through a series of structured interviews involving senior management (CEO, CFO and CIO or suitable proxies) that were recorded and later transcribed. This strategy was adopted to enable the researcher to triangulate the views of senior management and thus build a clearer picture of the IS investment in the organisation.

Once interviews were complete, each individual participant was provided with a copy of their transcript for verification and comment. Typically, this occurred within four weeks of the interviews being conducted. Feeding back the transcripts to participants was a key research design criterion. First, participants were thus provided with an opportunity to verify the contents of their interview transcripts, and second, where appropriate, they could clarify upon issues that they felt were not explained thoroughly during the interview (Yin 1994).

### **Contact Summary Sheets**

During each interview, a contact summary sheet was compiled. On each contact summary sheet, data regarding the participant being interviewed was recorded. The contact summary sheet was therefore used to record all field notes and observations made by the researcher of each individual participant. Specifically, the following information was recorded on each participant's contact summary sheet:

- Name<sup>7</sup> and interview date
- Position and organisation
- Main issues and themes observed of the contact
- Summary of information that could not be obtained for follow-up at a later date
- Any additional observations that were salient or illuminating
- Any new ideas that emerged from the interview that may have required follow-up

This information was later used to develop participant profiles during the data analysis phase. The use of contact summary sheets brought a high level of consistency to the data collection process and therefore contributed to the reliability and validity of results (Miles and Huberman 1994).

### **Secondary Data Collection**

A substantial amount of secondary data was collected that included financial and non-financial data from a variety of sources as shown in Table 6.7.

The secondary data was used to support primary data collected via the interviews to achieve convergence and saturation.

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<sup>7</sup> To preserve anonymity, all participants were individually assigned a code in the analysis so that they are not personally identifiable.

Source	Description
<ul style="list-style-type: none"> <li>• Annual Reports</li> <li>• Financial Statements</li> <li>• Financial summaries</li> </ul>	Annual reports produced by companies at each financial year end
IS investment data	Budget and actual expenditure data relating to IS investment
Australia Prudential Regulatory Authority Statistics	Industry statistics compiled by the regulator from submissions by individual FIs
Internal documents and archival data	Documents obtained from organisations relating to a number of aspects of operations, including: Strategy documents IT unit functional plans Internal satisfaction surveys External satisfaction surveys Project management reports
Industry analyst reports	Reports on performance of the FSS as provided by industry analysts
Newspaper reports	General reports and articles of interest relating to FIs and the FSS
Newsletters	Communications between FIs and a variety of stakeholders e.g. staff (internal) and customers (external)
Websites	Websites maintained by FIs, APRA, and other organisations of interest

Table 6.7: Secondary data sources

*Survey*

To test the extended conceptual model, a survey was conducted that targeted all Authorised Deposit-taking Institutions (ADIs) in the Australian FSS. A mailing list of all active ADIs was generated using information provided by APRA (APRA 2004). For each ADI, a questionnaire was mailed to the CIO (or equivalent).

*Data Analysis*

The data collection and analysis process was iterative using a variety of analytic techniques as outlined in Chapter 5. These processes of successive approximation continued until theoretical saturation was attained and the iteration process did not yield any new ideas (Eisenhardt 1989).

### Case Analysis Process

To bring structure to the complex task of analysing the significant amount of data generated by the interviews conducted in each of the cases, a process of (qualitative) analysis was derived utilising guidelines by Eisenhardt (1989), Miles and Huberman (1994) and Yin (1994). This process was incorporated into the case study protocol and is illustrated in Figure 6.5.

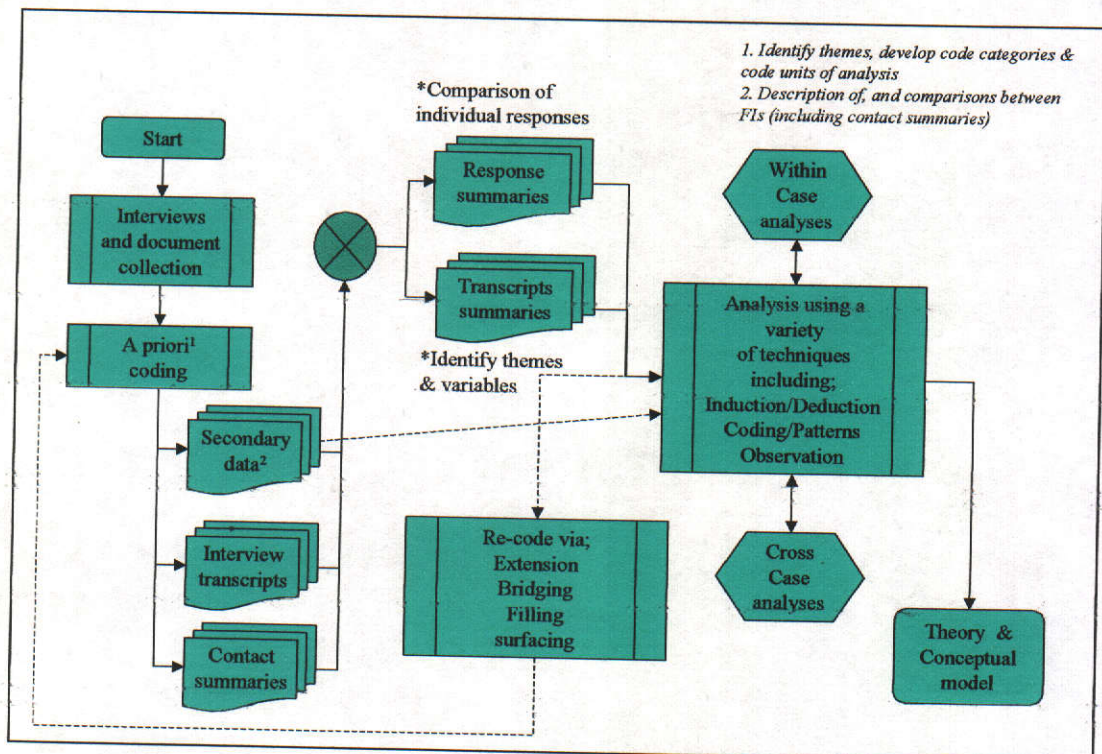


Figure 6.5: Qualitative data analysis process derived for and utilised in the research strategy

As has been alluded to earlier and demonstrated in the research design, all of the tasks in the research framework were closely integrated (Miles and Huberman 1994). Thus, the data analysis process actually began with development of the research design. According to Yin (1994), this a priori consideration of data analysis methods processes is critical to the development and execution of the research strategy as it forces the researcher to consider the type of data that will be collected, its purpose and how that data will be analysed.

As can be seen in Figure 6.5, the analytic process began with a priori coding based on the research instrument. The coding process developed a set of codes that would later be utilised through the application of both inductive and deductive techniques,

such as pattern matching (Chapter 5), to search for patterns and trends in the data and thus build an explanation of phenomenon under investigation (Appendix 2-2).

Interviews were conducted as per case study protocol and once transcribed, copies of raw transcripts were fed back to individual participants for verification and comment. Once participants had returned their transcripts, analysis of each transcript was then commenced. In each instance, the following techniques were used to analyse transcripts (Pare 2001):

- Searching of transcript to identify patterns, issues and themes as per a priori defined codes (Dominant modes of analysis (Pattern matching))
- Identification of new issues and themes
- Use of reflective/marginal remarks and comments to highlight identified patterns and trends within the text (Dominant modes of analysis (Explanation building))
- Induction and Deduction

The selection and application of these techniques is discussed in detail in Chapter 5.

When new themes or issues emerged, the original list of themes and codes was updated accordingly to fill or bridge any gaps and extend or clarify any emergent issues.

In addition, an individual 'Transcript summary' was created from each participant's interview transcript and a 'Response summary' created for each case. Transcript summaries contained a summary of each participant's responses to questions posed during the interview. This process of data reduction facilitated analysis by focussing the researcher's attention on comments that specifically answered the questions posed. A case response summary was also compiled (a collation of all participants' individual responses to each question) which facilitated comparative analysis of participants' responses. Together, these two sets of documents helped build each individual organisation's case report. Response and transcript summaries were particularly useful for within-case analyses and case reports for cross-case comparisons (Figure 6.6) respectively.

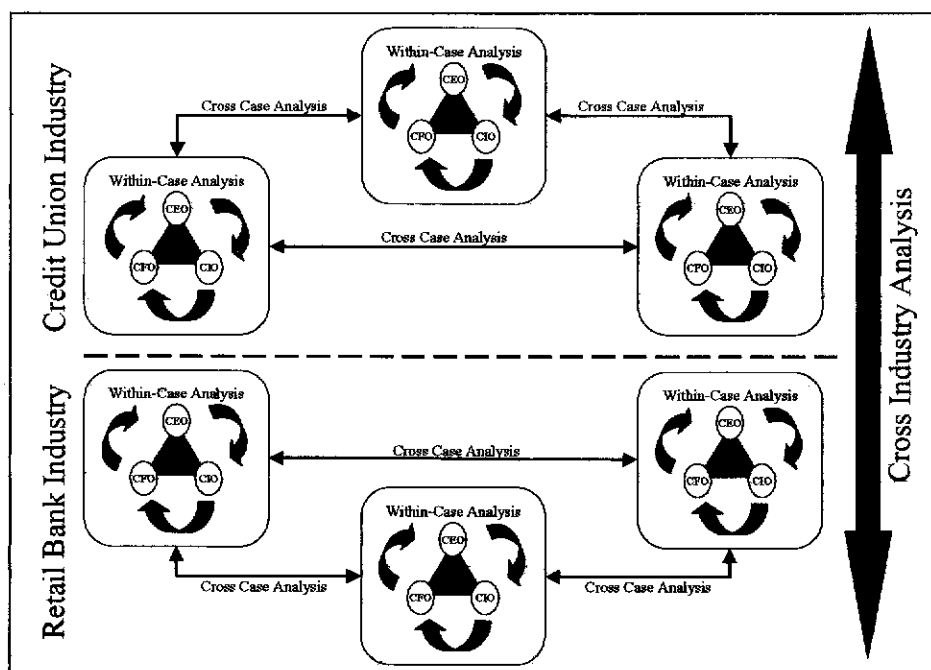


Figure 6.6: Within Case and Cross Case Analysis

Consequently, an extended conceptual model was built for each case and compared with others in the same industry. This resulted in the derivation of a composite extended model for each industry. Last but not least, the derived industry composite extended models were further compared and analysed to develop an understanding of the IS investment and organisational performance in the Australian FSS.

In addition, analysis of secondary data was conducted in parallel to the analysis of interview transcripts and thus contributed to the compilation of the case reports. Textual secondary data were analysed using the similar techniques to those utilised in the analysis of transcripts. Numerical secondary data were analysed using a variety of analytical techniques including ratio and trend analysis (Bazley et al. 1993).

### 6.3.5 Phase 3: Model Refinement

The final stage of the research program consisted of activities directed towards refining and finalising the conceptual model. Once all testing was complete, the resultant model was to be compared with existing models and the literature to verify its ability to explain the IS investment and organisational performance relationship. The deliverable from this phase was to be a more complete model that is both robust

and generalisable not only in the FSS, but one that could be extended to other economic sectors. Thus, once theoretical saturation had been reached and no new information could be deduced, the research will be deemed to have reached closure.

To facilitate the attainment of saturation, the research design allowed for a degree of iteration between the first two tasks in the third and final phase of the research design (Figure 6.3). This feature of the research strategy was incorporated to further strengthen the resultant model.

Thus, Section 6.3 has demonstrated the thoroughness, strength and flexibility of the research strategy adopted for this research. Further, embedding of the characteristics and components of a practical research design as discussed in Section 6.3 was deemed both necessary and critical to the success of this research.

The following section describes the research instruments developed for and applied in this research. As with the development of the research design, a highly structured approach was adopted in the development of these research instruments.

## **6.4 Research Instruments**

In this section, the two research instruments developed for this research project, an interview guide (Case research instrument) and a self-administered mail-based questionnaire (survey instrument), are presented and discussed in detail.

As the adopted research strategy incorporated a unique approach that utilised two research methods in concert, it is useful and instructive to take time to discuss these instruments, beginning with their construction through to their application. In so doing, the discussion will highlight the **relevance** and **rigour** of both methods and thus demonstrate their utility in investigating and explaining the relationship between IS investment and organisational performance. This section begins with a brief discussion on the guidelines utilised to develop and test the research instruments (Section 6.4.1). This is then followed by the presentation and discussion of the research instruments beginning with the Case research instrument (Section 6.4.2) followed by the survey instrument (Section 6.4.3).

### 6.4.1 Developing and Testing Research Instruments

The following guidelines were utilised to develop both research instruments (Sekaran 1992):

1. *Principles of wording*: including appropriateness of questions, level of sophistication of questions, sequence of questions, type/form of questions and any personal data that respondents may be asked to provide.
2. *Principles of measurement*: Including scales/scaling techniques, a thorough assessment of overall validity and reliability of the research instrument and a measure of the goodness of data collected (see also Neuman (2000)).
3. *General appearance and presentation of questionnaire*: including good readability, clear/concise instructions and an overall neat presentation.

In each instance, the application of the above guidelines resulted in a draft research instrument, one for Case research and one for Survey research. With respect to the Case research instrument, once the draft was complete, it was subjected to two levels of scrutiny to check and verify its ability to measure the phenomenon under investigation prior to its application in the selected organisations. At the first level, feedback on the structure and format of the Case research instrument was sought from an academic with extensive experience in the FSS. At the second level, a pilot was conducted within a medium sized commercial/retail bank as discussed in Section 6.3.4.

These foregoing activities resulted in a very robust Case research instrument that was technically sound and one which utilised terminology that was commonly used in the FSS so that potential participants would have little trouble in answering the questions posed. A similarly rigorous approach was used in the development of the survey instrument although this instrument was only subjected to one level of scrutiny and verification. As with the draft Case research instrument, the draft survey questionnaire was closely checked and verified by two academics with significant experience in IS research and the design of research instruments. Feedback obtained indicated that the survey instrument did not require any further amendment, primarily due to the fact that the survey research instrument was in effect an



adaptation of the instrument that had already been successfully applied in the Case research part of the project.

## **6.4.2 Case Research Instrument**

### *Why use a protocol?*

A *case study protocol* is a set of guidelines that can be used to structure and govern a Case research project (Yin 1994). It therefore outlines the *procedures* and *rules* governing the conduct of researcher(s) before, during and after the Case research project. In addition, a case study protocol can be particularly useful in research projects involving multiple researchers as it ensures uniformity in data collection and/or analysis (Yin 1994). Protocols also ensure uniformity in projects, such as this one, where data was to be collected in multiple organisations over an extended period. In addition to procedures, a protocol also contains the *research instrument* that is to be used to collect data during the research the project.

In this research project, the Case research instrument was a highly detailed and structured *interview guide* for conducting interviews in selected FIs. The interview guide consisted of a series of open-ended questions directed towards verifying the main components of the conceptual model and elucidating new themes and/or variables that would help refine the conceptual model thus assist in explaining the IS investment and organisational performance relationship. In addition, the case study protocol utilised in this research also contained a detailed qualitative data analysis guide for the conducting analysis of the significant amounts of primary and secondary data from each case.

### *Structure and Content of Protocol*

Table 6.8 summarises the structure and content of the Case Research protocol. The complete case study protocol is contained in Appendix 2-2. As alluded to earlier, Eisenhardt (1989) and Yin (1994) both highlighted the need for a case study protocol that can be used as a guide in conducting Case research. According to Miles and

Huberman (1994), such a protocol should outline the procedures and rules that govern the conduct of the researcher and the research project.

Section	Contents	Purpose
Preamble	<ul style="list-style-type: none"> <li>• Confidentiality and data storage</li> <li>• Publication</li> <li>• Documentation</li> <li>• Organisation of this protocol</li> </ul>	Contains information about the purpose of the protocol, guidelines for data and document storage, publication
General	<ul style="list-style-type: none"> <li>• Overview of research project</li> <li>• The Case research method</li> </ul>	Provides an overview of the research project and the Case research method. This section also contains the procedures
Procedures	<ul style="list-style-type: none"> <li>• Initial approach to organisations                             <ul style="list-style-type: none"> <li>○ Selection of cases</li> <li>○ Number of cases</li> <li>○ Establishing contact</li> </ul> </li> <li>• Scheduling of field visits</li> <li>• Length of sessions</li> <li>• Equipment and stationery</li> </ul>	Detailed description of the procedures for conducting each Case. These procedures were utilised to ensure uniformity in the data collection process and consequently facilitate both within-case and cross-case analyses
Research Instrument	<ul style="list-style-type: none"> <li>• Introduction</li> <li>• IT portfolio Questions</li> <li>• Organisational performance Questions</li> <li>• Managerial effectiveness Questions</li> <li>• Key considerations for (SISP) Questions</li> <li>• Organisational context Questions</li> </ul>	Interview questionnaire divided into five (5) sections each addressing one component of the conceptual model. Questionnaire was a structured instrument with open-ended questions. Questionnaire design also allowed for both probing and follow-up questions to drill down and extract more detailed data from participants
Data analysis guidelines	<ul style="list-style-type: none"> <li>• Overview of data analysis</li> <li>• Convergence of data from multiple sources</li> <li>• Triangulation of perspectives from multiple participants</li> <li>• “Within case” analysis</li> <li>• Descriptive Data</li> <li>• Explanatory Data</li> <li>• Individual case report</li> <li>• “Cross case” analyses</li> <li>• Cross sectoral analysis</li> <li>• Data schema</li> <li>• Data displays</li> <li>• Organisational performance measures</li> <li>• Demographic comparisons</li> <li>• Themes from interviews</li> </ul>	Guidelines for data analysis derived from recommendations by Miles and Huberman (1994), Yin (1994) and Neuman (2000).
Appendix	<ul style="list-style-type: none"> <li>• Participation request letter</li> </ul>	Form letter sent to potential participants requesting their participation. This was sent via email or post.

Table 6.8: Case study protocol outline

Despite the averred importance and criticality of case study protocols, it was surprising that there appeared to be very few established protocols published in the reviewed literature relating to Case research. What were available however, were guidelines for the creation of such protocols (Miles and Huberman 1994; Yin 1994). These guidelines were therefore utilised in developing the protocol for the Case research part of this study.

Consequently, the case study protocol developed for this research was unique. However, the structure of the protocol was sufficiently flexible that it could be adapted to other research projects.

The unique nature, flexibility and adaptability of the case study protocol therefore make this protocol and the proving of the guidelines by which it was developed significant contributions to the discipline of IS in general and the study of IS research methods in particular (Chapter 11). The main features of this protocol will now be discussed in detail.

### **Section 1 – Preamble**

The first section of the protocol contained general information about the protocol, and guidelines for publication and data/document storage.

### **Section 2 – General**

The second section of the protocol provided an overview of the research project and the Case research method, in terms of (a) the aims of the research project, (b) why it was important to conduct the research and (c) how the research was to be conducted.

### **Section 3 – Procedures**

The third second section of the protocol described the procedures that would govern the conduct of the researcher during the course of data collection. The procedures

detailed the manner in which organisations would be contacted, how field visits were to be scheduled/conducted and any equipment/stationery that would be required. Yin (1994) particularly recommends using uniform procedures when multiple researchers and/or multiple cases are involved.

The development and inclusion of this section in the case study protocol was deemed to be of particular importance as it ensured consistency and uniformity in data collection across the individual FIs and contributed to the comparability of results during analysis. In any empirical investigation, uniformity of method in data collection contributes greatly to rigour of method and to the validity of results (Miles and Huberman 1994).

#### **Section 4 – Research Instrument**

The fourth section of the protocol contained the actual research instrument used to collect data in the selected organisations. Primary data was collected via a series of multiple structured, open-ended questions. In addition, significant amounts of secondary data were also collected from multiple sources. The use of more than one data source is a technique known as triangulation that is highly recommended by many researchers (Miles and Huberman 1994; Yin 1994; Neuman 2000) as a mechanism for increasing both the reliability and validity of qualitative research (Chau 1999). Data from multiple sources were to be analysed using a variety of techniques including both inductive and deductive techniques to achieve convergence on a given set of facts (Chapter 5). The research instrument itself consisted of five sub-sections, each of containing questions directed towards addressing a specific component of the conceptual model, IT portfolio, Organisational performance, Managerial effectiveness, Considerations for SISP, and Context.

#### **Section 5 – Data Analysis Guidelines**

This section of the protocol outlined the guidelines and techniques for analysing the collected data. The inclusion of these guidelines was based on recommendations by

Miles and Huberman (1994) who argued that the a priori development of data analysis guidelines forces the researcher to deliberately consider the data that would be collected and its relevance to the research.

Consequently, a structured qualitative data analysis process was designed that enabled the researcher to follow a uniform and structured approach to data analysis in each case. This use of a uniform approach to analysis was deemed to not only facilitate within-case and cross-case analyses but to increase both the reliability and validity of conclusions drawn. Of particular interest in this section was the data schema developed for the protocol. This schema specified the secondary data that was to be collected prior to interviews being conducted. The protocol required that all organisations be provided with this schema prior to interviews being conducted. It was found that this not only saved time, but also gave participants a clearer understanding of their individual roles in the study.

## **Section 6 - Appendix**

This section contained a sample of the formal participation request letter sent to FIs, soliciting their participation in the study. This letter was sent after the first informal meeting with potential participants purely as a formality.

### **6.4.3 Survey Instrument**

To further test and thus strengthen the resultant conceptual model, a survey of a larger sample of FIs in the Australian FSS was conducted as per the research strategy. The survey was developed using guidelines by Sekaran (2000) and Neuman (2000). In essence, the survey questionnaire was based on, and was an extension of, the Case research instrument that was successfully utilised in the Case research part of the study. The survey process is described in sub-section 6.3.4 and illustrated in Figure 6.4. This section describes the actual research instrument.

*Structure and content*

The survey research instrument was made up of ten sections as shown in Table 6.9 (see Appendix 3-1 for complete survey instrument).

Section	Type of Question	Description
Instructions	Close-ended	Instructions to respondents on how to answer the questions asked
Demographic Data	Close-ended	Data describing each respondent, such as age, years of experience etc. To preserve anonymity, no personally identifiable data, such as names of respondents, were requested
Organisational Data	Close-ended	Questions designed to generate a profile of the respondent's organisation
IS department structure and function	Close-ended	Questions regarding the existence structure and function of IS departments
IS Investment	Close-ended	Questions regarding the areas at which IS investments are focussed and the role/impact of these investments
Organisational performance	Close-ended	Questions regarding organisational performance component of conceptual model and directed to identifying the KPIs (internal and external) utilised by FI
Managerial effectiveness	Close-ended	Questions regarding the factors that constitute this component and its role/impact in each FI
Considerations for Strategic Information Systems Planning	Close-ended	Questions regarding the factors that constitute this component and its role/impact in each FI
Environment	Close-ended	Questions regarding the environment/context of FIs
Comments	Open-ended	Open section for respondents to express their general opinions on the issues covered in the questionnaire

Table 6.9: Structure and content of Survey research instrument

The first section of the survey research instrument contained brief instructions to respondents on how to answer the questions in the questionnaire. The second section contained questions designed to extract demographic data, such as age, gender and education, and was thus designed to facilitate the creation of respondent profiles.

The third section contained questions designed to extract demographic data relating to the FIs in the sample. Thus, like the questions in the preceding section, these questions were designed to create profiles of participating FIs. Similarly, the fourth

section contained questions designed to profile the structure of the IS functions of the FIs within the sample.

The next five sections were targeted at establishing/confirming the components of the conceptual model, IS investment, organisational performance, Managerial effectiveness, considerations for SISP and context.

For the IS investment component, the questions in this section were designed to identify indicators used by FIs to denote their expenditure in IS and which could subsequently be associated with organisational performance in the conceptual model. Similarly, the organisational performance related questions also sought to verify the Key Performance Indicators used by FIs to measure performance, both internally and externally.

The Managerial effectiveness, considerations for SISP and Context sections also sought to identify/confirm the factors that constitute these variables and their role in the IS investment and performance relationship.

As demonstrated earlier, the processes executed in the design of both the Case research and the Survey aspects of the research project were rigorous and thorough. Consequently, the resultant instruments were robust, reliable and were thus anticipated to generate valid results of a high level of generalisability.

Thus the foregoing discussions have amply demonstrated the relevance and rigour in the development of the research instruments used in this research. The next section presents additional discussions on the research design to further demonstrate how the issues of **reliability** and **validity** were addressed and incorporated into the research design.

## **6.5 Reliability and Validity**

Quality in the conduct of research has long been an issue of concern for IS researchers, (Galliers 1990; Chau 1999). Central to the idea of quality in research and its conduct are the concepts of reliability and validity.

Table 6.10 demonstrates how the two concepts of validity and reliability were applied in this research design with attendant explanations in Sections 6.5.1 and 6.5.2.

Measurement concept	Test	Action	Applied During:	
Validity	Internal	Criterion	Research instruments based on extensive literature reviews	Phase one
		Face	Development of structured instruments that can be simply applied	Phase one
		Content	Research instruments covered all aspects of model	Phase one
		Construct	Use multiple sources of evidence to facilitate triangulation	Phase two
	Set up chain(s) of evidence		Phase two	
	Selected key participants review draft reports		Phase two and three	
	External	Replication logic used across multiple cases	Phase one	
Reliability	Stability	Case research instruments applied to different cases over the research project Survey research instrument based on Case research instruments	Phase one and two	
	Representative	<ul style="list-style-type: none"> <li>Develop a case study database</li> <li>Develop statistical database from survey</li> </ul>	Phase two	
	Equivalence	Use of research instruments with multi-item measures	Phase one and two	

Table 6.10: Ensuring validity and reliability in the research design and instruments  
(Adapted Neuman 2000))

### 6.5.1 Reliability

Neuman (2000, p518) defined reliability as:

*“The dependability or consistency of the measure of a variable”*

The foregoing definition suggests that a reliable instrument will produce the same or similar results when applied repeatedly. Neuman (2000) therefore identified the three



constituents of reliability as stability, representative and equivalence reliability, that if addressed will result in dependable instruments that are accurate, and provide consistent measurement. For example, it is important that research instruments are clear and unequivocal so that respondents interpret them correctly. Further, it is also important to use multi-item measures that “increase the level of measurement” (Neuman 2000, p166) to fully capture the factors that make up a variable. Lastly, the use of a pre-test or a pilot further increases the reliability of an instrument as demonstrated in Section 6.3.

### **6.5.2 Measurement Validity**

According to Neuman (2000), measurement validity depicts the ‘truthfulness’ of a research instrument. Consequently, a research instrument should have both internal and external validity (Table 6.10). Neuman (2000) identified the four components of validity as, content, criterion, concurrent and predictive validity and suggests that addressing all of these components will result in an instrument more closely approximates a true measure.

Effectively any research design that incorporates the concept of reliability ensures repeatability or recurrence of results/findings under similar conditions, whereas incorporating validity ensures a higher level of confidence in research instrument(s) such that it can be argued that the results obtained and reported match reality.

## **6.6 Chapter Summary**

This chapter presented a detailed description of the research design and concomitant research methods used to conduct research into the IS investment and organisational performance relationship. The chapter began with a thorough and detailed description of the components of a practical research design, the matching of units of analysis in both Case research and Survey research and the logic linking the data to propositions to illustrate how these critical features were incorporated into the research design. In addition, arguments for the use of multiple methods in this

research design were clearly presented supporting earlier discussions on the adoption and use of a pluralist approach to IS research (Chapter 5). The core of this chapter focussed on the two very important aspects of the research project, the research strategy and the research instruments.

In the first instance, the discussion centred on demonstrating the relevance and rigour of the research strategy. The research strategy itself was a very practical and highly structured three-phase process incorporating both Case and Survey research methods that was thoroughly grounded in the literature and based on a well established and tested framework. Thus, the first phase of the research strategy involved the problem statement and definition of the conceptual model. This was followed by the development of the conceptual model via Case research in phase two. Enfolded and comparing with the literature in the third and final third phase further refined the model.

The rigour of the research design resulted in a number of key features being incorporated that in turn strengthened this research strategy. First and most notable was the adoption of a pluralist approach to the research, with the consequent decision to use multiple research methods to create a more robust model of the IS investment and organisational performance relationship.

Second was the development of a comprehensive case study protocol that enabled the researcher to bring structure and control to an otherwise complex and unstructured task. Third was the development and use of a detailed process for executing the survey.

Fourth was the creation and application of a structured analytic process for Case research that assisted the researcher in the management of and analysis of the substantial volumes of data generated (analysis of statistical data resulting from the application of the survey instrument was performed via SPSS and did not require any special strategy to be devised). Clearly, these features contributed greatly to the reliability and validity of both research instruments.

After presenting the research strategy in detail, the discussion then turned to a detailed description of the research instruments. Again, the objective was to demonstrate the relevance and rigour in the development and application of the

research methods. Both research instruments were thoroughly discussed and their structure and content elaborated upon.

Finally, the chapter concludes by revisiting the critical issues of measurement reliability and validity, as they relate to the research instruments. This final discussion aptly demonstrated how these characteristics were incorporated into the research design in general and the research instruments in particular to ensure that the resultant data would, not only accurately describe the cases researched but also result in a strong and testable model and hence address a number of shortcomings in the current body of knowledge.

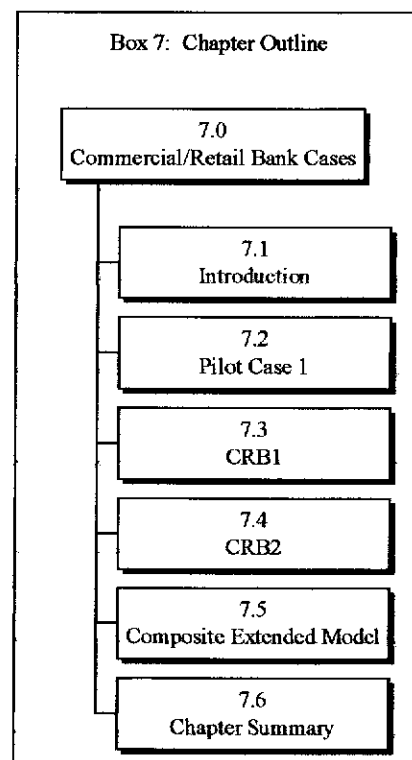
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# 7.0 Commercial/Retail Bank Cases

## 7.1 Introduction

This chapter presents and discusses the commercial/retail bank cases that participated in this research and in so doing achieves four objectives:

1. Demonstrates the reliability, validity, relevance and rigour of the case study protocol (and research instrument) as applied in each case.
2. Verifies the presence of the components of the conceptual model as originally proposed in commercial/retail banks.
3. Presents the results from the cases and demonstrates how these results were analysed to derive individual extended conceptual models for each of the commercial/retail bank cases.
4. The derivation of a composite extended conceptual model that more accurately depicts the relationship between IS investment and organisational performance in commercial/retail banks.



Section 7.2 presents the report on the pilot case, PC1 followed by Sections 7.3 and 7.4 that report on commercial/retail bank case 1 (CRB1) and commercial/retail bank case 2 (CRB2) respectively. These are then followed by the derivation of an extended conceptual model for the commercial/retail bank industry (Section 7.5). The chapter concludes with a summary of the preceding discussions.

Each case report is presented in three parts, beginning with a case description and followed by a case analysis and the presentation of the extended conceptual model. In each case, the description contains an introduction to the case and a detailed description of the case including data sources, participants and products/services offered by the FI in question. The case analysis presents the data collected and the analyses of these data. Beginning with observations and field notes, followed by detailed analyses and descriptions of organisational structures and how Information Systems are managed in each FI. Each case is meticulously developed through the analysis of the individual components of the conceptual model to explain the relationship between IS investment and organisational performance. Participants' views are triangulated and comparative analyses are performed with the secondary data to achieve further convergence. This aspect constitutes the 'within-case' analysis and results in the derivation of an extended conceptual model for each case.

The first case, PC1, is a medium-sized FI operating primarily in the Australian FSS. The two other commercial/retail bank cases, CRB1 and CRB2, are both large FIs that operate in local, regional and international markets. However, only the local arms of CRB1 and CRB2 were included as part of the research project. This enabled a more accurate comparison of the three FIs via the cross-case analysis strategy described in Chapter 6. Like PC1, both CRB1 and CRB2 offer a wide variety of financial services in direct competition with each other and PC1, thus, providing an excellent opportunity, not only for within-case analyses but also for cross-case analyses amongst the three commercial/retail bank cases.

Thus, a composite extended IS investment and organisational performance model was derived for the commercial/retail bank cases from the cross-case analyses. The resultant model will be used in further analysis and comparison with the credit union industry composite extended model (cross-industry analysis) to develop a clearer understanding of the relationship between IS investment and organisational performance in the Australian FSS (Chapter 10).

## **7.2 Pilot Case – PC1**

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The pilot case was conducted as per Case research guidelines specified in Chapter 6, not as a pre-test, but rather as a pilot to ensure reliability and validity in and of the case study protocol and research instrument. It was found that the use of a pilot did provide a number of advantages (Chapter 6) and facilitated the conduct of the research. The pilot case was therefore instructive and very beneficial as it achieved its primary objective of enabling the researcher to verify the validity of the case study protocol and research instrument (Van Teijlingen and Hundley 2001). On completion of the pilot case, both case study protocol and research instrument were carefully reviewed. Observations and analysis showed that only one minor change was required to the research instrument, which was immediately effected.

### **7.2.1 Case Description**

PC1 is a medium sized FI operating in one of the states in Australia and offers a wide variety of services including but not limited to funds management services, share-trading, insurance, corporate financial markets, retail, and commercial. PC1 is predominantly based in one state although it does service markets nationally within Australia. As at 2001, PC1 had over 2100 branches and agencies across Australia. In addition, PC1 operated over 3800 Automated Teller Machines (ATMs) and Electronic Funds Transfer/Point Of Sale (EFT/POS) terminals countrywide. Furthermore, and like other contemporary, FIs in the Australian FSS, PC1 has invested extensively in maintaining an online presence through its own website, thus providing its customers with a wide variety of channels, both physical and electronic, through which they access many of the products and services that it offers (PC1 2001b).

A key aspect of the PC1's strategy to date has been to improve performance by focussing on cost reduction through improved cost management, whilst maintaining the same or better level of service delivery (PC1 2000; PC1 2001b; PC1 2002). Other strategies for the future include increasing market share in a number of areas nationally, particularly the small to medium enterprise market, building the best

product range, creating industrial sector specialisations, improving internal/external support services and increased revenue growth (PC1 2001b).

*Data Sources and Participants*

Contact was first initiated with PC1 informally through the CFO. Subsequent to that, a meeting was arranged during which an overview of the research project and its objectives were discussed. Further, the CFO was provided with a detailed explanation of the case study protocol. Potential participants were also identified, with the selection of participants being conducted with the CFO's aid and in accordance with the case study protocol. A draft schedule for the interviews was then drawn up, but these were confirmed at later date. Table 7.1 summarises all data sources and participants for PC1.

<b>Data Source(s)</b>	<b>Type/Summary</b>
Participant 10 (P10) – Chief Executive Officer (Finance and Corporate Services SBU)	Interview transcript
Participant 11 (P11) – Chief Information Officer	Interview transcript
Participant 12 (P12) – Chief Financial Officer	Interview transcript
Contact Summary P10	Field notes from Participant 10 interview
Contact Summary P11	Field notes from Participant 11 interview
Contact Summary P12	Field notes from Participant 12 interview
Annual Reports, Financial Statements and summaries	1997 – 2003
Newsletters and other documentary evidence	Information regarding PC1 and its activities as reported for the benefit of a variety of stakeholders
PC1 Website	Variety of documents and information regarding PC1's; <ul style="list-style-type: none"> <li>• Customer services</li> <li>• News and information</li> <li>• Products and services</li> <li>• Information for Shareholders</li> </ul>

Table 7.1 Data sources and participants in PC1

During the initial meeting, it was also agreed that a PC1 staff member be nominated to act as liaison with the researcher thus ensuring a single point of contact with the

organisation and facilitating clear and efficient communication between the researcher and the organisation (as per case study protocol).

Thus, it was emphasised during this first meeting that the interview transcripts would constitute the primary data sources. In addition, an explanation of the data schema and all the secondary data sources specified in the data schema was provided to the both the CFO and the liaison. This was necessary to facilitate the collection and compilation of this secondary data before the conduct of the interviews. It should be noted that PC1 did not provide all the secondary data in the data schema, citing confidentiality. However, sufficient data was gathered from the primary sources and other publicly available documentary evidence to facilitate the case analysis and the construction of a conceptual model for PC1.

Once formal consent to proceed with the interviews was obtained from PC1, appointments were arranged with each participant and confirmed via the liaison. Although, each interview was scheduled for a duration of approximately 60 – 90 minutes, all interviews had to be shortened slightly due to participants' pressing business engagements.

### *Products and Services*

PC1 provides a broad range of services in all market segments relating to personal and corporate banking (Table 7.2).

Observations indicated that PC1, like other contemporary FIs, relies heavily on its IS for many of its activities including delivery of products and services to customers and the processing of the large volumes of data generated daily (Prasad and Harker 1997; Frei, Harker and Hunter 2000).



Personal banking products and services	Credit cards
	Savings and investment
	Home loans
	Online banking
	Leasing
	Wealth creation – Financial planning
	Foreign exchange and international payments
	Transaction accounts
	Packaged deals
	Personal loans
	Insurance
	Corporate banking products and services
Business accounts	
Economic updates	
News and research	
Credit cards	
Online banking	
International trade	
Business loans	
Merchant solutions	
Hire purchase or lease	

Table 7.2: Illustrative products and services offered by PC1

The foregoing (Section 7.2.1) constitutes the case description of and for PC1. The following section (Section 7.2.2) constitutes the second part of the case report (the case analysis) consisting of the within-case analyses based on primary and secondary data collected from PC1.

## 7.2.2 Case Analysis

### *Observations and Field Notes*

As stated earlier, three participants from PC1 were nominated for and participated in this research. The first participant interviewed was the Chief Executive Officer of the Finance and Corporate services Strategic Business Unit (SBU), to whom both the Chief Financial Officer and the Chief Information Officer reported as shown in Figure 7.1. The following sub-sections are derived from observations made and field notes taken during the interviews. As specified in the research design, these

observations and field notes enabled the researcher to gain a better understanding of the participants, which in turn facilitated the interpretation of their responses.

### **Participant 10 (P10) – Chief Executive Officer, Finance and Corporate Services**

The Finance and Corporate Services SBU provides all of the 'shared services' in PC1. This is accomplished through six functional areas, Legal, Finance, Information Systems, Human Resources, Premises and procurement and e-Business Enablement.

P10 appeared very knowledgeable with several years banking experience. Discussions with P10 indicated that P10 had only recently been promoted to the role of CEO of the Finance and Corporate Services SBU, not more than 12 months prior to the time these interviews were conducted. According to P10, one of the Finance and Corporate Services SBU's key objectives was to improve the delivery of IS services in the organisation and consequently had recently initiated an IT improvement program, focussed not just on current and future technologies but also on the processes around the provision of technology to the organisation. Observations indicated that P10 was very much in favour of using IS investment to improve organisational performance. These observations were later supported in the analysis of interview data.

Due to pressing business engagements, P10 was unable to afford the researcher the full 90 minute time period allotted for the interview, with the interview lasting approximately 60 minutes. Consequently, not all questions in the interview guide could be asked, however, the interview was successfully conducted and provided sufficient data to enable analysis as per the case study protocol.

### **Participant 11 (P11) – Chief Information Officer**

Observations of P11 created the impression of a very knowledgeable person with extensive experience in both IS and banking. P11 displayed strong technical knowledge as might be expected given P11's role and the diversity/complexity of technologies used in PC1. P11 appeared very enthusiastic about using IS to deliver

better organisational performance. However, it was noted that there appeared to be organisational structure and management issues that appeared to impede the IS department's ability to provide support for all technologies in PC1. As shall be discussed later, not all IT in PC1 was controlled by the IS department, and this was observed to be a major stumbling block to understanding the true cost of IS in the organisation. It was this realisation in part led to the institution of an IT improvement program championed by P10.

### **Participant 12 (P12) – Chief Financial Officer**

Observations of this participant indicated that P12 was very knowledgeable and very experienced as a CFO. P12 appeared to have a predominantly internal focus with particular emphasis on the Finance function. This was deduced from P12 responses which, in some instances, created the impression that P12 may not have been fully aware of some of the processes or activities that took place outside of the finance function, particularly those relating IS planning and management.

P12 appeared to be very conscious of organisational politics and the researcher formed the opinion that P12 might have adopted and used a bureaucratic style of management (Mintzberg and Quinn 1996). This management style would have made P12 well suited to the banking environment, as FIs generally tend to be bureaucratic (Harker and Zenios 2000b).

### ***Structure***

PC1's organisational structure was a highly functional structure that was distinctly separated into five SBUs: 1) Risk Management, 2) Corporate Office and Strategic Projects, 3) Personal Banking, 4) Business Banking and 5) Finance and Corporate Services (Robbins 1987; Willcocks, Feeny and Islei 1997). Each SBU was lead by a senior manager (General Manager or Chief Executive Officer) who in turn reported to the Group Managing Director (Figure 7.1).

Thus, PC1's structure reflected its overall corporate strategy wherein the market was segmented into two main areas 1) Personal banking (Retail) and 2) Business banking (commercial) serviced by two specific SBUs (PC1 2001b).

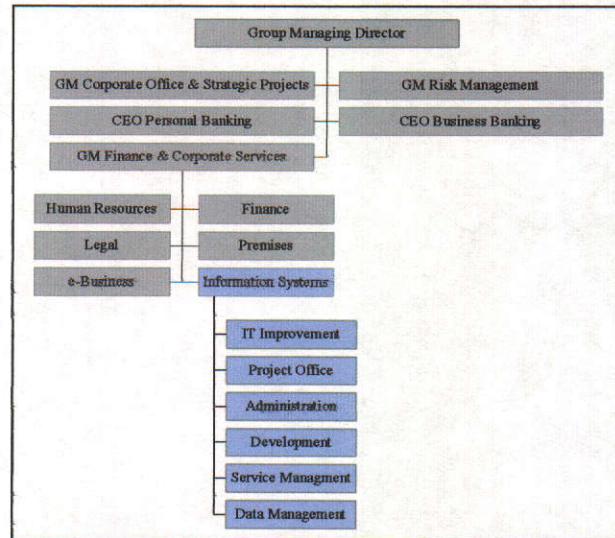


Figure 7.1: PC1 organisational structure

Discussions with participants indicated that PC1's structure has undergone a number of changes in the past in response to changes in the environment (Edey and Gray 1996).

As can be seen in Figure 7.1, the Information Systems department of PC1 was located in the Finance and Corporate Services SBU. One potential shortcoming observed in PC1 was the fact that although the IS department was lead by a senior manager (Chief Information Officer), a direct link between the IS department and the Group Managing Director did not exist. Avison, Cuthebertson and Powell (1999) commented on the apparent contradiction that such structures pose, where the use of IS may be considered critical to the operational efficiency, competitive advantage and ultimately the performance of an organisation yet paradoxically, the status of the IS department was relatively low suggesting that the IS department may be considered a function of lesser importance. Many researchers Raghunathan and Raghunathan (1993), Ward and Griffiths (1996) and Khandelwal (2001) also concurred that such structures have a number of disadvantages that may (potentially) negatively impact on the ability of the IS department to play its role and thus contribute significantly to organisational performance. The foregoing observations from the literature were observed to hold true in PC1. Suffice to say, PC1 should

ideally have had a structure wherein there is direct linkage between the Chief Information Officer and the organisation's Chief Executive Officer, in this case the Group Managing Director, thus placing the IS department on par with other functional areas within the organisation. Such a linkage has a number of advantages which ensure that, inter alia, the IS department is accorded the same level of 'respect' as other functional areas and that the IS department actively participates in planning and other important decision making processes (Ward and Peppard 2002).

The above observations were reinforced during discussions with participants which indicated that the IS department was primarily perceived to be more of a supplier of services than an active partner. This situation was further complicated by the fact that, though the IS department was technically responsible for all IT, the reality was that some IT was managed by individual departments. Consequently, even though SISP was undertaken, it appears this was an activity that was performed after the fact, suggesting a much lower level of integration between IS strategy and corporate strategy than was perceived (Ramani and Pavri 1994; Tallon, Kraemer and Gurbaxani 2000).

In spite of the IS management issues observed above, there appeared to be a strong belief in PC1 that IS investments did and will continue to contribute positively to organisational performance. Further, the institution of an IT improvement program presented PC1 with a unique opportunity to review existing structures, institute appropriate changes to address these shortcomings and hence maximise existing and future investments in IS.

### *Dimensions of Organisational Structure*

The organisational structure depicted in Figure 7.1 is an example of the typical hierarchical structure, designed along functional lines, that is commonly implemented in many organisations (Robbins 1987). Being a medium sized organisation, PC1 displayed a relatively high level of spatial differentiation with many PORs geographically dispersed throughout the state, although management of the organisation is very centralised.

In addition, the structure also displayed a high level of both horizontal and vertical differentiation (Robbins 1987), coupled with a high level of formalisation as may be expected in an organisation of this size and maturity. Discussion with participants revealed that such formalisation of procedures and processes might tend to bureaucracy (Edey and Gray 1996).

### *Size*

PC1 has experienced good growth over the period 1997 to 2001. During this period, net assets grew approximately 26%. Total operating income over this period grew approximately 10% with net interest income around 5%. In the 2000/2001 fiscal period, most indicators showed double digit growth with the lowest being total operating income at approximately 14% and the highest growth being non-interest income, which was up around 27% (PC1 2001b).

On the other hand, during the same period total staff numbers (Full Time Equivalents, FTEs) fell by approximately 1%, reflecting both the realisation of benefits from previous investments in technology and a strong cost management focus that have both seen PC1, like many other FIs in the Australian FSS, substituting labour with capital investments (Hunter and Hitt 1997; Gizycki and Lowe 2000). This was particularly evident in the reduction in the number of agencies and part-time offices (approximately 31%) with a significant increase in technology such as ATMS (approximately 78%) (PC1 2001b).

### *Managing IS Activities*

Although the IS department in PC1 is responsible for IS budgets, both operational and strategic, discussions with all participants revealed that there were 'pockets' of IT that were under the direct control of individual SBUs. Clearly, this situation was not ideal and did make it difficult for the IS department to have a clear understanding of all IS costs as some IS costs were incurred and borne by some SBUs. As P11 observed:

*“Personally, its very difficult for us to know what the cost of IT is to this organisation. So the metrics that you see here are as within my line of vision. Outside of my line of vision there’s a whole bunch of other expense going on, there are contracts directly being borne by the business with vendors and service providers. So not only are we unable to understand what the cost is, it’s very difficult to manage that cost.”*

Thus, although discussions with P11 revealed that the IS department has an administrative unit (Figure 7.1) which is responsible for preparing IS budgets, it was evident that P11 questioned the efficacy of current IS budgeting and planning processes. For instance, P11 described the IS budget process as follows:

*“Typically that budget process is built from the bottom up and it is a frustrating exercise...when we come up with that budget and it doesn’t match the magic number that the executive management team has in mind and falls upon us to go back refine and tune and prune... What I would like to see is a more top-down approach taken which is to say if we are targeting this degree of profitability from the organisation...then we need to generate this much revenue in which case we can only afford to have this much on our expense line. So, P11, here’s how much you have to spend in this financial year, make the most of it, rather than have me build it up from the bottom up and see that I am well over what that threshold would be. But I understand the dilemma in trying to achieve both outcomes, its not a science.”*

From P11’s comments it was clear that under the current structure, the IS department may not have direct input into the budgeting and planning process at an executive level, although it did have representation in the form of the CEO of the Finance and Corporate services SBU (DeCanio, Dibble and Amir-Atefi 2000). This feature was very evident in the structure (Figure 7.1) and raised questions as to the role of the IS department in these budgeting and planning processes.

Clearly there was a contradiction in terms of the apparent low status of the IS function in PC1, where it is perceived to be a functional unit that ‘takes orders’, and the apparent critical role of the IT that it supports. This in turn may be argued to have

implications for the impact of the IS investment on organisational performance (Khandelwal 2001).

Although it was suggested by participants that, in the past, most IS initiatives were led by the IS department, discussions revealed that the approach to IS management/implementation in PC1 had changed particularly in relation to areas such as projects and project management. Most projects are now initiated by SBUs to fulfil a perceived need and are therefore perceived to be business projects that require IS support as opposed to simply being perceived as IS projects. However there still are projects that are predominantly in the domain of IS and these are dealt with accordingly. Thus, according to P12:

*“So the whole budget for the project is done by the user, the business, IT is required to submit the costs of the IT component for the whole project to the business project manager.”*

Participant 10 confirmed and highlighted the fact that this approach was relatively new to PC1, and that in the past the bank was typically led by the IS department in many respects (possibly due the fact that this unit understood the available technologies much better than their non-technical counterparts). Thus:

*“I think we have come from a background whereby the IT area used to sponsor the change and really the business was almost a silent participant...they would participate but did not really understand the technology and they were embarking on new technology systems because the IT area had sold it to them, that it was best for their business. We’ve transformed a lot of that now. A lot of the technology change is now led by the business...and that’s happened in the last four/five years.”*

The foregoing discussion regarding the management of IS activities in PC1 suggests that the overall contribution of the IS department to the organisation may have been understated (Miller 1993). Clearly, some effort has been made to redress the situation so that the IS department and other SBUs become equal partners in the delivery of IT solutions. However, much more still needs to be done to ensure that the organisational structure and processes reflect this acknowledgment of the critical role



and status of the IS function and thus facilitate the management of IS within PC1 (DeCanio, Dibble and Amir-Atefi 2000).

When one considers the foregoing shortcomings in PC1's structure, two suggestions immediately come to mind. To begin with, the IS department's status ought to be elevated by having the CIO as a member of the executive management team, followed by the transfer of control of all IT to the IS department (Avison, Cuthebertson and Powell 1999). These two actions would contribute significantly to the resolution of the problems highlighted earlier with respect to the management of IS activities.

However, the fact that some IT was under the control of the some SBUs, raised the possibility that any attempt to implement the above changes could result in some conflict driven primarily by cultural inertia and resistance to change (Stacey 1993; Peppard and Ward 1999). Hence, any changes would have to be carefully weighed in terms of their potential to disrupt the status quo and an appropriate change management program devised to contain any potentially negative outcomes and minimise their effect on the organisation (Robbins 1987).

### Investment in IS

#### **Motivation for IS Investment**

Like the other commercial/retail banks in the sample, PC1 invests in IS for a number of reasons including improving organisational processes and providing better services to customers. Consequently, management recognised the need for PC1 to continuously improve its technology. It is due in part to this recognition that PC1 embarked on an IT improvement program and invested significantly in improving its architecture in the 2000/2001 fiscal years as revealed in discussions with P10 who highlighted some of the weaknesses that PC1 was rapidly attempting to overcome.

To further emphasise the importance of IS investments and their impact on organisational performance, PC1 recently invested in an Enterprise Resource Management System that was anticipated to enable PC1 to move the majority of its processes onto one common platform that would service all areas of the organisation.

The objective of this strategy was to further enhance organisational efficiency. In addition, PC1 has recognised that investing in IS could enable it to reduce costs which would further contribute to its strategy of achieving improved efficiency over time (PC1 2001a). Furthermore, as part of the drive to manage IS costs, PC1 has maintained its outsourcing strategy and has strengthened relationships with outsource providers (Willcocks and Lester 1999).

When it comes to methods for evaluating potential IS investments, it was evident that PC1 predominantly utilises financial methods, such as Net Present Value (NPV). P11 also suggested the use of other methods such as Payback Periods and Multi-Criteria Decision Making (MCDM) to further enhance and strengthen the process of IS evaluation (Renkema and Berghout 1997). Discussions with participants indicated that the financial methods though widely used were perceived to be inadequate as they failed in many instances to demonstrate the full benefit of particular IS investments. This observation is consistent with evidence from the literature (Ballantine, Galliers and Stray 1996). P11 summed the problem of evaluating and justifying IS investments succinctly as follows:

*“I think they are as good as they can be. I think that the problem with a lot of IT projects, a lot of business projects that require an IT spend is that it is very difficult to argue that we shouldn't be doing them, the market needs it, the customer needs it, it's a compliance issue, its makes our systems stronger whatever it is...”*

### **IS Investment Threshold**

The results from discussions pertaining to the existence of an IS investment threshold were equivocal. It was apparent that none of the participants was aware of the concept of an IS investment threshold and its potential application in managing IS investments. When presented with the concept however, they each demonstrated that they were amenable to it although they were divided as to its application. P10 viewed the threshold as a constraint, or a **limiter**, and therefore having limited application to managing IS investments. Thus, P10 suggested that the concept of an IS investment

threshold was a subjective measure, which could place constraints on the level of IS investment. According to P10:

*“...one of the problems I have with that sort of measure, is when you look at technology costs what do they replace? They replace people costs. If you put a constraint on technology costs are you missing out a big opportunity... so I have a fundamental problem with that sort of arbitrary measure.”*

P11 and P12 on the other hand suggested that the threshold was contingent on the ‘cycle’ in which the organisation found itself in, suggesting therefore that this threshold could play a dual role either as an **enabler** or a **limiter**. In addition, whilst P11 agreed with the concept of an IS investment threshold, P11 went further to suggest that the actual level of investment may range between a minimum and maximum value depending on the cycle that the organisational was going through. According to P11, these values ranged ideally between 10% and 14%, but noted that in reality this threshold was probably between 15% and 17% as a result of the difficulty of estimating the true cost of IS in PC1 due to the aforementioned pockets of IT expenditure that existed out of the IS department’s domain. Thus according to P11:

*“I don’t believe that there is any one magical number, once again it depends on the market that you are in, the cycle that you are going through, the nature of the market that you are in”*

It is worth noting that the above observations by P11 appear to suggest that higher IS expenditure by an organisation could lead to higher cost ratios. However, these observations do not appear to be supported by the literature. In fact, evidence from the literature contradicts P11’s observations and suggests that higher spending on IS does not necessarily lead to a higher IS expense to total expense ratios (Harris and Katz 1991).

Further, P12 agreed with P11 on the idea that FIs go through investment cycles and consequently subscribed to the idea that the threshold will vary depending on the cycle. As P12 suggested:

*“In any one year we may chose to invest nothing for whatever reason and the next year we might have to make up for it”*

Clearly the concept of an IS investment threshold is one that has merit and as the majority of the participants in PC1 concurred, it could be a tool that can be utilised in the management of the IS investment and organisational performance relationship.

IT Portfolio

**Definition of IS**

Discussions with participants indicated that there were broad definitions of what constitutes IS and IT in PC1. These views are summarised in Table 7.3.

P10	<i>“... it consists of a whole bunch of things from just the providing of information from our systems, it consists of developing applications that enable the business to do business... so its really the provision of anything that is related to technology. That all essentially gets encapsulated in IT”</i>
P11	<i>“Well, its a group of functions that performs everything from ongoing services which includes maintenance and support of systems that serve the business today, be they internal or customer facing”</i>
P12	<i>“I think of anything that happens electronically and it is up to our IT unit to deliver that electronic capability to our customers or the users.”</i>

Table 7.3: Definitions of IS and IT in PC1

Clearly, there did not appear to be any formal definitions of what constitutes IS and IT in the organisation. This confirmed observations in the literature regarding the lack of consensus on what constitutes IS and IT (Kauffman and Weill 1989). Further, it can be argued that this lack of formal definitions could affect the organisation’s ability to select and implement effective and efficient IS strategies.

Whilst still on the issue of defining IS and IT, P10 and P12’s responses are worthy of further scrutiny. They suggested that ‘anything that happens electronically’ or ‘is related to technology’ was the responsibility of the IS department. Yet it was apparent from other discussions around the management of IS activities that this may not really have been the case in PC1 as there were some IT that was the responsibility of individual SBUs and hence were not under the jurisdiction of the IS department. Clearly, this situation has profound implications for the management of

the IS investment and organisational performance relationship in PC1 (Robson 1997; Pearlson and Saunders 2004). It was reassuring to note however that P11 was aware of these issues, although it was difficult to gain an appreciation of when these issues might be resolved.

### *Needs of Organisation*

According to P10, the current IT portfolio did not fully meet the needs of the organisation, although it did contribute to organisational performance. Consequently, an IT improvement program was instituted to not only look at technologies per se, but to also review the organisational structures and processes around these technologies. P10 suggested that the current situation was a result of the approach to IS investment in the past that was largely driven by technology. P11 concurred to a certain extent, suggesting further that the IT portfolio “...*broadly meets the needs...*” and arguing that PC1 operates in a very dynamic environment that required “...*constantly responding to competitive threats in a changing environment and a new set of demands almost on a daily basis.*” Thus, P11 believed that although the IT portfolio broadly met the organisations needs, more work was required as “...*evidenced by a number of large scale developments occurring as we speak for which there is a significant investment.*” (P11).

### *Impact of IS Investments*

Discussions with participants indicated that the focus of previous investment in the IT portfolio has been directed primarily at the middle layer of the IT portfolio (Chapter 4, Figure 4.8), the Transaction Processing Systems, as they are believed to have the most significant impact on performance. When asked if IS contributed to performance, P10 response was very clear, although it came with a proviso. IS investments were believed to contribute to performance (Harker and Zenios 2000b), though PC1, like other FIs, would prefer to spend much less on IS if it were at all possible (Carrington, Llanguth and Steiner 1997). P12 concurred and added that much of PC1’s customer transactions were processed electronically and without the

automation that IS provides, the high volume of transactions could not possibly be handled as efficiently. In addition, interchange capability with other FIs such as credit card processing and even connection to the national payments infrastructure would not be possible.

Thus, participants agreed that IS investments do impact upon performance and that this impact was generally positive. According to P12:

*“Yeah I think that’s absolutely fundamental to our performance because if we do not have it then performance doesn’t happen.”*

P11 went on further to suggest that there was greater value in investing primarily in the TPS and MIS levels of the IT portfolio. Hence:

*“...at the moment it is the tactical level because of the way it is organised and where some of our pieces fit in. It’s not working well so we can do something very quickly there.”*

P12 also concurred as follows:

*“They typically get the most investment because they are the vehicle through which this organisation earns its revenue.”*

However, in light of earlier discussions, it was clear that although the TPS may have benefited from a higher proportionate spend over time, the entire portfolio’s impact on organisational performance may still be considered to be understated due to the lack of a full understanding of the true cost of IS in PC1. Despite these shortcomings, IS investments in PC1 were clearly motivated by the need to improve organisational performance through a number of strategies including cost reduction, substitution of labour with capital and improved efficiency and effectiveness in its processes (Frei, Harker and Hunter 2000; Shin 2001).

Thus, research in PC1 confirmed the presence of the IT portfolio component of the conceptual model and demonstrated its suitability and practicality as a mechanism for identifying the level of IS investment in an organisation.

Organisational Performance

As previously discussed, the identification of the most appropriate Key Performance Indicators (KPIs) that could be utilised to better understand the IS investment and organisational performance relationship was a key objective of this study. Hence, as the pilot case, PC1 provided a unique opportunity to achieve two goals. First, it enabled the researcher to verify the research instrument’s ability to identify these performance indicators. Second, it provided a ‘first look’ at what these indicators could possibly be (Van Teijlingen and Hundley 2001).

The following sub-section reports on the findings regarding this aspect of the model in the pilot case.

**Key Performance Indicators**

It was evident that PC1 utilises KPIs that are predominantly financial in nature. Table 7.4 summarises the KPIs used in PC1 as deduced from interviews with participants and supported by documentary evidence such as annual reports (PC1 2001a) and APRA (APRA 2003).

Internal	<ul style="list-style-type: none"> <li>● Economic Value Add (EVA)</li> <li>● Actual versus Budget</li> <li>● Service Level Agreements             <ul style="list-style-type: none"> <li>○ Benchmarking against Gartner Group research</li> </ul> </li> <li>● Customer e.g.             <ul style="list-style-type: none"> <li>○ Surveys</li> <li>○ Satisfaction</li> </ul> </li> </ul>
External	<ul style="list-style-type: none"> <li>● Financial Indicators e.g.             <ul style="list-style-type: none"> <li>○ Earnings Per Share</li> <li>○ Profit Growth</li> <li>○ Return On Investment</li> <li>○ Return On Equity</li> <li>○ Net Interest Income</li> <li>○ Non Interest Income</li> <li>○ Cost to Income ratio</li> </ul> </li> </ul>

Table 7.4: Internal and external KPIs used in PC1

The indicators identified in Table 7.4 are also congruent with those identified during the meta-analysis (Chapter 3) and later confirmed in the preliminary testing (Chapter 9). According to P10, these indicators are the same indicators used to report on the organisation to stakeholders, such as shareholders, the regulatory authority and the community at large. Thus, P10 justified the predominant use of financial KPIs as follows:

*“...when you make IT decisions you actually obviously have to look at the financials and people always relate to the financials.”*

From an IS perspective, PC1 utilises indicators such as service level metrics determined by/between SBUs and formalised through Service Level Agreements. According to P11:

*“...there are other service level metrics, very important ones that those internal service departments use to gauge their effectiveness, i.e. did I or didn't I deliver the services that were negotiated, agreed and signed up by the internal business customer.”*

However, it was not clear how these KPIs were related to IS investment in PC1, although P11 argued that there was a direct link between IS investment and these indicators by virtue of the fact that IS investments were perceived to add value to the organisation. Specifically, P11 stated that:

*“...obviously the amount of IT investment or the value that IT adds to the organisation...affects all of those indicators, the cost to income ratio, the EPS, so there is a direct linkage, there's no doubt about that, because banking is such an IT enabled business and it is no where near as manual as it used to be.”*

P10 further suggested that the use of financial KPIs during IS investment decisions provided the quintessential link between these KPIs and the level of IS investment. In addition, P10 also suggested that the linkage was borne out in the use of a “Balanced Score Card for each of the business units”. However, only P10 made mention of the use of a Balanced Score Card in PC1, none of the other participants mentioned the use of the Balanced Score Card within the organisation.



The foregoing led to the conclusion that participants believed that it was difficult to relate IS investment directly to the identified KPIs. This was attributed to the fact that there are many factors, apart from the IS investment, that contribute to organisational performance (Powell and Dent-Micallef 1997). In spite of this, participants were unanimous in their belief that IS investments contributed positively to organisational performance and therefore do in fact impact on these indicators. This conclusion was also supported by participants' confirmation that many of these indicators were considered during the IS investment decision-making process.

Thus, for PC1, this research confirmed the presence of the organisational performance component of the conceptual model. The research clearly confirmed that there are two aspects to organisational performance, internal and external, whose Key Performance Indicators (KPI) were determined to a greater or lesser extent by stakeholders (D'Souza and Williams 2000).

#### *Considerations for Strategic Information Systems Planning*

It was evident that PC1 undertakes SISP, thus providing material support for this component of the conceptual model. However, closer examination revealed that the manner in which this process was carried out had significant implications for the IS investment and organisational performance relationship.

To begin with, it was noted that PC1 utilised a hybrid of centrally planned and free market IS strategies (Earl 1993). It was also apparent that the aforementioned status of IS in the organisation also affected the SISP process and discussions with participants also suggested a strong correlation between the status and importance of the IS function and the manner in which the SISP process was conducted.

To elaborate, the responsibility for IS strategy did not lie with the IS function, but rather in a different unit called e-Business Enablement. Thus according to P12:

*"...the responsibility for preparing IT strategy is with a unit called e-Business Enablement, that's not P11's area, it's a peer area."*

Further, the final responsibility and decision-making with respect to IS strategy lay with a committee made up of executive managers. In both instances, the CIO was relegated to a supporting role, firstly to provide input to the head of e-Business Enablement who constructed the IS strategy and secondly to P10 who was a member of the executive committee. Clearly this situation would (and did) have an impact on the nature, structure and content of the IS strategy as well as the role of the CIO.

In addition to the foregoing issues, a concern was raised regarding the effectiveness of the SISP process. Discussions with P12 indicated a lack of understanding of this manner in which SISP was carried out. Given P12's role in the organisation, this was perceived to have a serious and potentially negative implication for SISP. When questioned on the SISP process, P12 answered thus:

*"I don't pretend to know it that well. I think it's a diagnostic on what we have currently within our armoury a diagnostic of what's lacking what everybody wants and then how we put it all together, either piecemeal or according to a consistent strategic methodology."*

Despite the foregoing, P12 rated the SISP process as a four (4) out of five (5) in terms of its effectiveness and suggested that this was improving over time. P11 on the other hand rated this process lower at three (3) out of five (5). According to P11, the SISP process tended to be:

*"...done after the fact. Like the current set of the bank strategies were done I think in isolation from the IT strategy..."*

Thus, the SISP process was conducted separately to the business strategy process, although indications were that the SISP process was intended to support the business strategy process (Ward and Peppard 2002).

It was therefore deduced that in PC1, the considerations for SISP were aimed at ensuring that the IS strategy was aligned with corporate strategy and thus designed to promote profitability through a number of tactics including the creation of an enabling environment for staff.

Thus, it emerged from the responses in Table 7.5 (and preceding discussions) that in PC1, IS investments were targeted at four key areas, operational efficiency, staff, customer service quality and product delivery.

Specifically, the following responses were obtained:

P10	<i>"...its all around group profit growth, customer growth and creating something exciting for our people."</i>
P11	<i>"I guess agreement and understanding of the directions that we will take for the exploitation of technologies, the funding for those technologies and the resources that we will need to exploit those technologies"</i>
P12	<i>"...to make sure that our IT strategy is consistent with the organisational strategy, to make sure that all the right stakeholders who need systems have a contribution to make on what future strategy is on systems they that need to link back to the customer."</i>

Table 7.5: Responses regarding questions relating to the considerations for SISP in PC1

Further, P10 and P12 both emphasised the impact of IS investment on customer service quality, with P10 suggesting that this was because the business of banking was primarily driven by customers. It was deduced that these areas could in effect form a set of intermediary variables at which IS investments are directed and which in turn have a direct impact on organisational performance. This indirect relationship was also observed in the meta-analysis (Chapter 3).

Thus, this research confirmed the presence of the considerations for SISP component of the conceptual model in PC1. The results clearly confirmed that this component of the conceptual model provided a 'feedback loop' that in essence completes the IS investment and organisational performance relationship. Consequently, the considerations for SISP provide a mechanism for evaluating the effectiveness of prior IS investments in terms of their impact on organisational performance.

### Managerial Effectiveness

This component of the conceptual model attempts to establish the role and impact of management on the IS investment and organisational performance relationship in FIs (Chapter 4). Thus the Managerial effectiveness component was made up of a five

factors: a) senior management commitment to IS, b) firm experience with IS, c) user satisfaction with IS, d) the organisation's internal political environment, and e) organisational structure (Weill 1992; Markus and Soh 1993). Participants' responses regarding the impact of these factors and the over impact of Managerial effectiveness are summarised in Table 7.6.

Factor	Impact (Low, Med or High)
Senior management commitment to IS	High
Firm experience with IS	High
User satisfaction with IS	Medium to High
The organisation's internal political environment	High
The organisational structure	High
Overall Perceived Impact	High

Table 7.6: Presence and impact of Managerial effectiveness factors

When queried as to the commitment of senior management to the effective and efficient utilisation of IS in PC1, all participants indicated that this was perceived to be high. Whilst this may have been the case, it is instructive to note yet again the apparent contradiction regarding the status of the IS department in PC1 discussed earlier. This however did not detract from the perception that IS did contribute positively to organisational performance and that PC1 was very reliant on its IS.

On the question of organisational experience with IS, participants all agreed on the fact that the level of experience was high, with P10 and P12 rating this experience as three (3) to four (4) and four (4) out of five (5) respectively. P11 did not provide a numerical rating, preferring to make the following statement:

*"I think most sectors in the bank and the bank as an individual, or if you like as a collective group, is pretty IT savvy. They understand that we rely heavily on computerisation and therefore they are always seeking for ways to exploit it."*

With regards user satisfaction, participants were requested to rate both internal (employee) and external (customer) user satisfaction on a five (5) point Likert scale. This factor of Managerial effectiveness is significant, as the 'satisfaction' construct has been used in much of the IS literature a proxy for system success (DeLone and McLean 1992; Ballantine et al. 1996; Seddon 1997). Thus, it can be argued that high

levels user satisfaction are an indication of successful IS which in turn may be argued to contribute to improved levels of organisational performance (Sohal and Ng 1998; Skok, Kophamel and Richardson 2001). In this case, participants were requested to indicate the level of user satisfaction, both for internal (employees) and external users (customers). Participants' responses in this regard are summarised in Table 7.7 and suggest a medium level of user satisfaction regarding IS in PC1 (on a five point Likert scale).

User satisfaction	P10	P11	P12
Internal	4	3 to 4	2 to 3
External	4	4	2 to 3

Table 7.7: Ratings of user satisfaction in PC1

With the exception of P12, participants' responses regarding the user satisfaction factor of the Managerial effectiveness component indicated a medium to high level of user satisfaction both internally and externally, thus suggesting successful IS within PC1. This in turn provided support for earlier assertions by participants that IS were contributing positively to organisational performance. In addition to the foregoing, questions were also asked relating to the extent to which satisfaction was a critical determinant to their IS investment decision-making process(es). Furthermore, participants were also asked to indicate what formal mechanisms were utilised by their FIs to measure satisfaction (Appendix 2).

Turning to the organisation's internal political environment, it was evident that this was a sensitive issue for PC1. This opinion was initially formed during the informal meeting when amendments were suggested for the research instrument regarding a question relating to this issue. Although the question was reworded and rephrased, it was apparent that the participants were not keen to discuss this issue and its impact on IS investment decision making.

From an organisational structure perspective, it was unequivocal that the structure has had a significant impact on the role that management plays in IS investment and decision making as discussed earlier.

Thus, this research confirmed the presence of the Managerial effectiveness component of the conceptual model in PC1. Consequently, it was concluded that the

Managerial effectiveness component (and its constituent factors) does influence IS investment as suggested by the conceptual model and it follows therefore that this in turn impacts on organisational performance.

### Context

The final aspect that this research investigated in PC1 was the effect of an organisation's context on the IS investment and organisational performance relationship. Following discussions with participants regarding this issue it emerged that there were a number of issues in the environment that might affect the IS investment and organisational performance relationship.

To begin with, the Australian FSS was characterised as highly competitive (Chapter 2). Thus, PC1 like other FIs was under constant pressure to respond to these competitive forces. Participants acknowledged that competition played an important role in shaping IS investments due to the critical role that IS played in many aspects of the organisation (Krishnan et al. 1999).

Thus, P12 identified issues such as regulation, competition and corporate governance as holding significant implications for PC1 with respect to IS investment, with regulation being highlighted as a significant influence in this regard. P11 also suggested that IS investment decisions made internally could also have an effect on the environment. P12 concurred and went on further to provide the following example:

*“Well I think this online business banking, well let's take Internet banking, can the IT capability change the way people do their banking? Absolutely! Has it changed the customers' environment? Yup, they can now bank from home. It's up to them as to the degree they do it and its up to us to deliver it well. So, yeah absolutely.”*

Support for the impact of IS on an organisation's environment may also be found in the literature on the use of IS in as a competitive tool (Mcfarlan 1984; Pearlson and Saunders 2004). Thus, research in PC1 confirmed the influence of an organisation's IS investment and organisational performance relationship.

### 7.2.3 Extended Conceptual Model for PC1

Figure 7.2 illustrates the resultant conceptual model of the relationship between IS investment and organisational performance in PC1. When compared with the original conceptual model (Chapter 3), it is observed that although there are some similarities with the original model, there are also some significant changes as a result of this research.

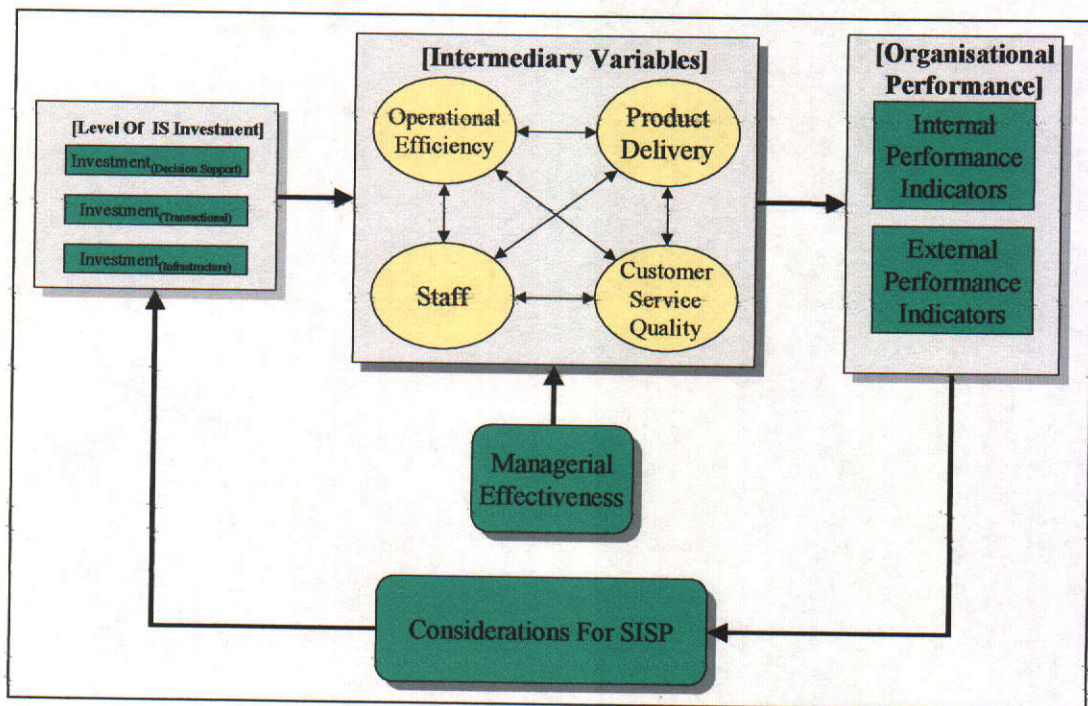


Figure 7.2: Conceptual model for PC1

First, the conceptual model derived for PC1 shows all the components depicted in the original conceptual model a result that was significant in that it provided strong support for the research in general and the conceptual model in particular.

Second, the emergence of a set of intermediary variables constituted a significant difference with the original conceptual model. The original conceptual model suggested that IS investment has a positive and direct influence on both internal and external performance. However, research findings, from PC1, suggested an indirect relationship with a set of intermediary variables moderating the relationship. This result was also significant as it supported findings in the meta-analysis as to the nature of the IS investment and organisational performance relationship (Chapter 3). Research in PC1 therefore suggested that IS investment was targeted at four areas: 1)

Operational efficiency, 2) Product delivery, 3) Staff, and 4) Customer service quality. Chapter 10 expands on and discusses these variables in detail together with their implications for FIs.

This set of variables is significant as it was deduced from data provided by participants within the FSS. Consequently, it is anticipated that these findings will assist in developing a better understanding of the relationship between IS investment and organisational performance in the FSS. More importantly, strong support for these variables and their impact on organisational performance can be found in the literature (Harker and Zenios 2000b; Holland and Westwood 2001). As deduced from the primary data, the variables in this set are also likely to interact with each other.

Further, it can be assumed that the impact of IS investment on each of these individual variables will not be equal. This suggests that emphasis placed on each of these variables will vary depending between FIs as they seek to differentiate themselves, for example one FI one may choose to invest in IS to improve its operational efficiency, whereas another may focus on improving customer service quality (Duncan and Elliot 2002). It is therefore logical to assume that PC1 would seek to address any one or all of these variables with the ultimate aim of improving organisational performance by directing IS investments at these variables.

In summary therefore, the pilot was extremely useful in that it achieved its design objectives (Van Teijlingen and Hundley 2001). First, it facilitated the verification and refinement of the case study protocol and Case research instrument. Second, data gathered from the pilot yielded high-quality results that were later incorporated into the cross-case analysis for commercial/retail banks and hence contributed to the development of the conceptual model.



## **7.3 Commercial/Retail Bank Case 1**

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### **7.3.1 Case Description**

CRB1 is a large FI operating as part of a larger diversified group of companies. It operates locally (Australia), regionally (Asia/Pacific) and internationally with offices in a number of cities around the world (CRB1 2002b). CRB1's banking business comprises mainly of wealth management, commercial and retail banking. A board of eight (8) directors provides corporate governance including strategic direction and monitoring of financial performance.

As CRB1 is a part of a much larger group of companies whose operations cover a broad variety of economic activities, the case study was limited to the Australian commercial and retail banking arm.

#### *Data Sources and Participants*

Contact with CRB1 was initially established with the Group Executive Officer (GEO) of the Information Systems SBU who immediately expressed an interest in the project and invited the researcher into the organisation. The GEO recommended the Chief Technology Officer (CTO) as liaison between the researcher and CRB1. Consequently, all contact with the organisation was conducted through the CTO, including interview scheduling and secondary data collection. The use of a nominated liaison between the researcher and the organisation was a tactic employed as per the case study protocol and one that was found to be particularly effective when communicating with participating FIs. Three participants from CRB1 were nominated to participate: 1) the Group Executive Officer (Information Systems), 2) the Chief Technology Officer and 3) the Chief Financial officer (Table 7.8). Both the CTO and the CFO were part of the Information Systems SBU and reported directly to the GEO. In order to minimise disruption to participants' schedules all interviews were conducted and completed in the space of one working day. Secondary data was also collected prior to and after the interviews. The whole process from initial contact to the conduct of the interviews spanned a period of approximately 8 weeks. It should be noted that there was continued contact with CRB1 after the interviews

were conducted in terms of follow-ups for secondary data and confirmation of other data/information provided.

Data Source(s)	Summary
Participant 7 (P7) – Group Executive Officer, (Information Systems)	Interview transcript
Participant 8 (P8) – Chief Technology Officer	Interview transcript
Participant 9 (P9) – Chief Financial Officer	Interview transcript
Contact Summary P7	Field notes from Participant 7 interview
Contact Summary P8	Field notes from Participant 8 interview
Contact Summary P9	Field notes from Participant 9 interview
Annual Reports and Financial Statements	1997 – 2003
Financial Performance summary	Ten year summary of key financial data (1993 – 2002)
Newsletters and other documentary evidence	Information regarding the CRB1 and its activities as reported for customer benefit
CRB1 Website	Variety of documents and information regarding CRB1's; <ul style="list-style-type: none"> <li>• Customer services</li> <li>• News and information</li> <li>• Products and services</li> <li>• Information for Shareholders</li> </ul>

Table 7.8: Data sources and participants from CRB1 case

As alluded to earlier, CRB1 is a large FI, and therefore it was not possible to interview the Group CEO. However, this was anticipated in the research design and sampling process, hence the nomination of the GEO as suitable proxy for the CEO since the GEO (Information Systems) reported directly to CEO and was a member of the executive committee.

There were no constraints experienced with the second and third participants in this case, namely the CTO and CFO, and they were nominated for participation according to the case study protocol. The three participants work closely together in the planning, budgeting and operational management of the Information Systems SBU.

Products and Services

CRB1 provides a wide variety of banking products and services to a broad range of customers across different demographics ranging from the country to the metropolitan areas of Australia (Table 7.9).

Private Banking	Home loans
	Insurance – home, car, travel etc
	Personal credit cards
	Personal loans
	Investment and Superannuation
	Personal transaction accounts
	Savings accounts
	Foreign exchange and international payments
	Personal banking
	Personal banking
Business and Corporate	Finance and capital
	Cash flow management
	Property
	Insurance
	Investment and Superannuation
	International
	Business Advisory services
	Financial markets
	Custodial services
	Corporate/business cards
Managed investments	

Table 7.9: Illustrative products and services offered by CRB1

Thus, CRB1 competes with other FIs in what may be considered a limited market (Australia) and where the potential for growth is largely determined by each FI's share of the customer's 'wallet' (Trewin 2000). Consequently, CRB1 recognises that opportunities for growth lie in the area of improved product delivery channels and structuring of (affordable) products to meet ever-changing customer demands (CRB1 2002a). Further, the foregoing is taking place in an environment where banks have traditionally been viewed as being insensitive to customer needs, charging unnecessarily high fees and making high profits at the expense of customers and customer service (Duncan and Elliot 2002). It is these latter views that have in part led to the growth and success of the credit union movement (Chapter 2).

### Community Involvement

Like many other FIs, CRB1 has recognised the importance of a broad range of stakeholders to its ongoing well-being. Thus, CRB1 has instituted a measurement system whereby its performance is rated against more than 70 indicators relating to social, economic and environmental aspects (CRB1 2002c). Specifically, CRB1's social responsibility and community involvement can be grouped into four main categories, customers, employees, environment and communities (CRB1 2002c). It is noteworthy that these categories are in keeping with the definitions of stakeholders as defined by Stakeholder theory (Freeman 1984). An example of the environmental responsibility, as given by one of the participants was the fact that CRB1 will not finance or be involved in project that may result in or bring harm to the natural environment.

### **7.3.2 Case Analysis**

#### Observations and Field Notes

Three participants were nominated for and participated in this research. The first participant interviewed was the GEO of the Information Systems Strategic Business Unit (SBU) who acted as a proxy for the Group CEO and to whom both the Chief Financial Officer and the Chief Information Officer reported as shown in Figure 7.4. The following sub-sections are derived from observations made and field notes taken during interviews. As specified in the research design, these observations and field notes enabled the researcher to gain a better understanding of the participants' responses, which in turn facilitated the interpretation of their responses.

#### **Participant 7 (P7) – Group Executive Officer (Information Systems)**

In CRB1, the IS department is a Strategic Business Unit (SBU) led by a Group Executive Officer (P7), who is a member of the executive committee of CRB1. The unit is responsible for its own budget (operational) and contributes to CRB1's overall IS budget (strategic). The following are highlights from observations made during

the interview with the P7. It should be noted at this point that due to pressing business engagements, interview time with the P7 was shorter than prescribed in the case study protocol. Thus, not all questions in the protocol could be asked of this participant. In addition, the CTO was invited as an observer/participant in the interview. This provided a unique and interesting opportunity for the researcher to observe some interaction between the two participants as they discussed some of the questions in the research instrument.

P7 was a well-educated individual who has had extensive experience, over 30 years, in Information Technology, banking and other industries. During the preliminary discussion prior to the commencement of the interview, P7 revealed a keen interest in the business value of IS not only from a professional perspective but also from an academic/personal perspective. In fact, P7 revealed an ambition to embark on a doctoral program of study to develop and test a model based on experiences in the finance and IT fields. Some general, though brief, discussions then ensued on the merits of P7's model that provided further insight into P7's perspective on IS investment in the FSS.

Thus, it was clear that P7 had a very keen interest in the relationship between IS investment and organisational performance and demonstrated a clear belief that IS investment contributes significantly (and positively) to organisational performance. In addition, P7 also demonstrated an understanding of the theoretical underpinnings of the discipline of IS in general, including an understanding of the concept of an IS investment threshold. Further, it was observed that P7 considered IS a major driver for business in the FSS. In this regard, it was noted that P7 would like to see more creative and innovative uses of technology in bringing products and services to the market. A particularly good example in this regard was the Internet (and e-commerce) that P7 sincerely believed would play a significantly greater role in the future of the Australian FSS.

### **Participant 8 (P8) – Chief Technology Officer**

P8 had direct reporting to P7 and had responsibility for CRB1's IT architecture (Figure 7.4). In this role, P8 was responsible for designing the technical

infrastructure, applications, security and processes employed by CRB1. P8 was also responsible for establishing policy regarding the technologies in use and had a quintessential role in advising senior management on available technologies and their suitability or otherwise for the organisation. In addition, P8 was also responsible for IT strategy, both at the operational and corporate levels. To perform this function P8 had a small team of researchers, typically university graduates, who researched market data from a variety of sources, including The Gartner Group, to generate various analyses and other information that were then utilised in the strategy formulation process.

At a higher, corporate strategy level, P8 was part of a matrix structure within the bank that was responsible for overall strategy. Thus, P8 was the technology representative in the virtual strategy team for the SBU. From observations made during the interview, P8 appeared very knowledgeable with regards Information Technology. P8 had over thirteen years experience in banking and IT and appeared to be very convinced of the positive contribution of IS to organisational performance. There was a certain like-mindedness and congruence of ideas between P7 and P8 in terms of their individual perspectives on the use of IS within the organisation, with both appearing to believe that the organisation could do more as far as the acquisition and utilisation of technology was concerned.

Although P8 was very clearly a technical person, P8 also displayed a good understanding of business issues both internally and externally, and was thus able to relate these back to IS strategy and the attendant IS investment decisions. One can surmise that P8's extensive experience in the FSS contributed to this understanding and has been accumulated as tacit knowledge embedded within the individual that can be applied in the execution of his complex role (Wood et al. 2004).

### **Participant 9 (P9) – Chief Financial Officer**

P9 was the Chief Financial Officer of the Information Systems SBU. In this role, P9 had a number of responsibilities including financial management, budgeting, planning and day to day accounting for the Information Systems SBU. P9 worked in liaison with other CFOs within the group to ensure that appropriate and accurate

accounting disciplines are maintained. Thus, P9 (along with other CFOs) was responsible for ensuring that the internal charge-back system for cost recovery, based on an Activity Based Costing (ABC) model, was adhered to and utilised fully to the benefit of CRB1 in general and the Information Systems in particular. Although P9 appeared to have a good understanding of IS issues as they related to CRB1, many of P9's responses tended to take a relativistic or contingent stance. It was also noted that P9 has a very strong focus on costs and related issues (this may well have been as a result of P9's role within the SBU).

### Structure

Figure 7.3 shows the organisational structure of CRB1 as at 2003. All participants agreed that CRB1 operates in a very dynamic environment and hence its structure was constantly in a state of flux. In 2001/2002 alone, changes were made not only in management personnel but also in the overall structure as the organisation positioned itself to compete more effectively in its markets, locally, regionally and internationally (CRB1 2002b; CRB1 2003b). Given this constant state of change, it was deduced that change management was an important issue for CRB1 (Stacey 1993; Avgerou 2001).

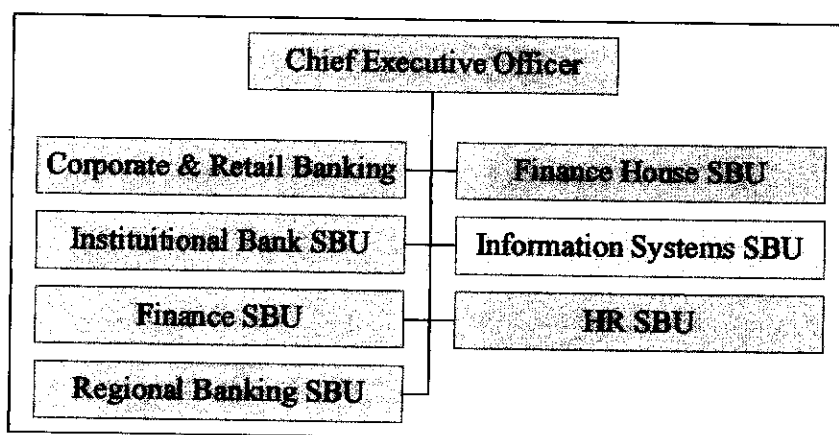


Figure 7.3: CRB1 corporate structure

Figure 7.4 illustrates the structure of the Information Systems SBU. Like other SBUs in CRB1, this unit was recently restructured with the aim of creating a more effective unit to service the needs of both internal customers (users) and external customers. As part of this restructure, a dedicated project management unit was created with

greater emphasis on risk management and delivery of projects on time and on budget.

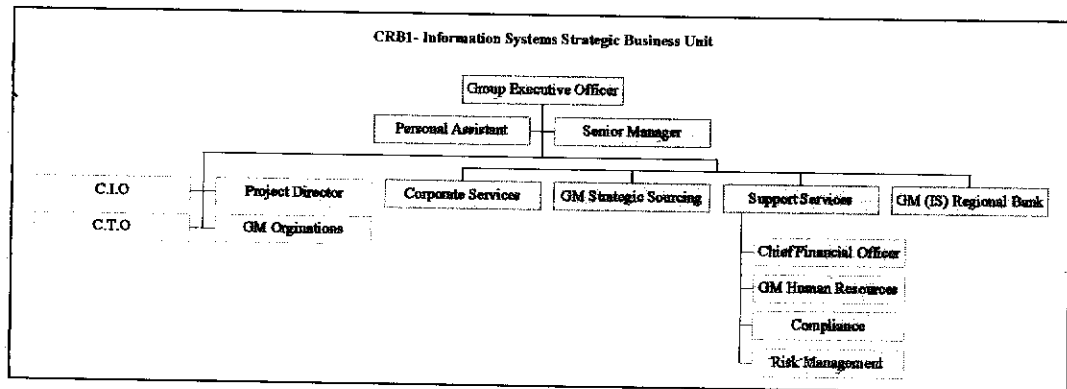


Figure 7.4: Structure of Information Systems SBU in CRB1

In addition, CRB1 recently recognised that it has reduced investment in infrastructure over the past five years whilst focussing on other areas. Consequently, a major upgrade to infrastructure was planned that was to be overseen by this project management unit (CRB1 2003b).

### Dimensions of Organisational Structure

CRB1 has a basic hierarchical structure as shown in Figures 7.3 and 7.4. According to Robbins (1987), such structures exhibit high levels of both horizontal and vertical differentiation and this was evident in CRB1. In addition, CRB1 utilised virtual teams in a matrix structure for activities such as strategic planning. Further, CRB1 displayed a high level of spatial differentiation through its geographically dispersed Point of Representation (POR) network.

CRB1 also displayed a high level of formalisation as may be expected in a mature organisation. Further, CRB1 is a highly centralised organisation. This is typical of many FIs and may tend to lead to a certain level of bureaucratisation within the organisation (Robbins 1987; Harker and Zenios 2000a).

In summary therefore, CRB1 structure exhibited hybrid characteristics with a hierarchical (centralised) operational management structure coupled with a matrix (team-based) structure for strategic planning (Mintzberg and Quinn 1996).



### Size

Like other FIs operating in the Australian FSS, CRB1 has experienced good growth over the past ten years (CRB1 2002d). Net Interest Income has grown 58% and Non-Interest Income 61%. Total assets have grown over 80% whereas there has been a drop of 30% in Full Time Equivalent staff accompanied by an 11% decrease in the total number of PORs. Much of this reduction in staff and PORs may be attributed to a shift in strategy from the traditional 'brick and mortar' (labour intensive) model to the more modern 'click and mortar' (capital intensive) model using IS as facilitator (Harker and Zenios 2000b; Earl and Khan 2001). On the issue of cost, Cost to Income ratios have dropped approximately 3% from 57% to just over 54% and were predicted to further decline with improved cost management (CRB1 2002b). Clearly, CRB1 was a very healthy organisation that had a strong outlook.

### Managing IS Activities

The IS SBU was self-contained and managed all IS activities, both operational and strategic. Strategic functions include SISP, project planning/management and input into the corporate planning process. According to P8, operational activities include: 'Business as usual', or normal day-to-day IS management activities, management of outsourced activities, human resources management and operational budgeting and planning.

CRB1 utilised a wide range of management tools and financial methods for evaluating IS and justifying potential IS investments, including but not limited to (CRB1 2002a):

- Return On Investment (ROI)
- Return On Equity (ROE)
- Internal Rate of Return (IRR)
- Discounted Cash Flow methods – Net Present Value and Pay-back periods
- Cash flow analyses

- Impact on Profit and Loss analyses
- Project Implementation Reviews (typically twelve months post implementation)

It was evident that all participants considered the sole use of financial evaluation methods inadequate for justifying IS investments, a view that has significant support in the IS literature (Ballantine, Galliers and Stray 1996; Robson 1997). However, although there was indirect reference to qualitative assessments as an alternative, these were not specified (Table 7.10).

P7	<i>"They are certainly suitable and certainly are part of the process, but they are not the only drivers for that. We also look at the strategic implications. If ROI and ROE were the only drivers we'd never replenish our infrastructure."</i>
P8	<i>"No we absolutely need {additional criteria}, financial is not adequate in its own right... Things like NPV and IRR are very blunt instruments"</i>
P9	<i>"Well its always a challenge...I mean you can have a wonderful NPV, but a serious PandL hit in the first year, we have regard to both...you always have to look at, does this project make sense on an NPV basis in the first place"</i>

Table 7.10: Responses regarding the use and suitability of financial methods for managing IS activities in CRB1

It is anticipated that CRB1 will consider greater use of qualitative assessments in future, as senior management in the IS SBU are aware of the shortcomings of current methods. Further, the growing acceptance of the use of such qualitative assessment could be part of a learning process for the organisation, something that the IS SBU could strongly influence with the passage of time (Andreu and Ciborra 1996).

The following sub-sections discuss the individual components of the conceptual model after application of the data collected in CRB1.

### Investment in IS

#### **Motivation for IS Investment**

CRB1 is a large public listed FI whose IS investments were directed at adding value to the organisation (CRB1 2003b). This was achieved through increasing process efficiency whilst reducing processing costs and driven primarily through strategic

sourcing and highly focussed IS management. As discussed earlier, participants suggested that CRB1 has recently recognised that it has not invested in its infrastructure as much as it should have over the past five years and consequently has recently embarked on a major project to upgrade its infrastructure.

### *IS Investment Threshold*

With regards the question of the existence or otherwise of an IS investment threshold, two out of the three participants (P7 and P9) agreed with the concept of an IS investment threshold and suggested that they considered an ideal value for this threshold to be around 10%. P8 on the other hand, whilst agreeing with the concept could not be specific as to what the value of this threshold might be. Thus, according to P7:

*“The international benchmark for retail banks says that around 10% is the average, okay. Institutional banks and wholesale banks are sometimes as high as 30%...on average {threshold} will come out at about 10.5%.”*

P9 concurred with this view as follows:

*“I think there is a level that you have to have...There is the reality of staying in the game that you have to have. I often debate with P8 around what scale of IT investment you have to have. He talks around the 10% of our expense base is in the IT space, in his view. I think that’s right.”*

Whereas P8 had the following opinion:

*“It’s really a very hard question! What’s the minimum threshold as a percentage? To be really honest I haven’t actually thought about it too much as a percentage question, but there absolutely is, and I actually think its quite large.”*

The foregoing comments appear to support the utility of the concept of an IS investment threshold and therefore, it could be argued that this concept could have implications for the management of IS investments in organisations in general and

FIs in particular given their high reliance on IS (Bender 1986). For an organisation as large as CRB1, a keen appreciation of the concept of an IS investment threshold could thus be a useful tool not only for ensuring that IS investments are not compromised over time, but also as a tool for benchmarking performance against existing (and potential) competitors. Clearly, this may not have been the case in the past, hence the recent drive to upgrade infrastructure, however, it was evident that P7, having recently been appointed to the position of GEO, had recognised this shortcoming and was working towards its resolution. This observation led to the conclusion that, where necessary, P7 would aim to influence the organisation and build an appreciation of this concept within the CRB1. This was as it should be and is certainly one of the reasons why a direct relationship between the CEO and CIO is essential (Khandelwal 2001).

### *IT Portfolio*

#### **Definition of IS**

The participants in this case displayed some differences regarding their views on the definition of IS and IT. P7 and P8's definitions were similar in that they both considered the technology and the capabilities provided by that technology and thus their definitions were in line with the definition of IT provided in the Chapter 2. According to P7:

*“...our Information Technology, basically covers all of our technological capabilities right throughout our organisation, starting at the data level moving through the physical infrastructure- ATMS, call centres, Internet portals then moving up to the actual desktop and the physical manifestation of that into PDAs, telephones and mobiles and all that stuff and then finally up to the very top level of the organisation.”*

Thus, P7 defined IT broadly in terms of the technological capabilities afforded to the organisation. Similarly, P8 defined IT in terms of the technological artefacts that exist within the organisation:

*“From my perspective, IT is very pervasive as I mentioned earlier in a bank. A bank is essentially an information processing service, so from desktop to network to midrange to you know main frame to the telephone line to just about any physical technical device that is used in the production of the business and how they run.”*

P9 on the other hand chose a much broader perspective and hence provided a definition that was more consistent with the definition of IS provided in Chapter 2. P9’s definition therefore encompassed the structure and management of the IS department, although there was reference to both outsourced and insourced functions:

*“...in CRB1 we talk about IT as being, what we’ve outsourced is all our applications development, main frame, midrange, distributed computing and all our data and voice to Telstra. In house retained is all our architecture, all our systems development, all our maintenance, both technical and business maintenance. So we would define IT in CRB1 as a combination of what we’ve retained in-house and what we’ve outsourced to our outsource partners...”*

Thus, it was evident that there was a measure of congruence in views regarding what constituted IT and IS in CRB1 amongst the participants. Such a situation may be perceived as being more ideal for and conducive to SISP than would have been the case otherwise (Weill and Olson 1989; Earl 1993).

### **Rating of IT Portfolio Components**

Participants were requested to rate the importance of components of the IT portfolio on a scale where one (1) was least important and five (5) most important to determine the relative importance and contribution of each of the components of the IT portfolio (Table 7.11). It may be argued that these perceptions of importance/contribution could have a mitigating effect on the IS investment decision making process.

As discussed earlier and as can be seen in Table 7.11, P7 and P8 showed a strong congruence in their views regarding IS. P9 on the other hand took a relativistic stance by suggesting that the importance of the individual IT portfolio components was contingent on the circumstance that CRB1 might find itself in.

Participant	Ratings of Importance		
	Infrastructure	Transaction Processing Systems	MIS
P7	5	5	5
P8	5	5	5
P9	Contingent on circumstance		

Table 7.11: Participant ratings of relative importance of IT portfolio components

However, it was evident in discussions with the participants that they all appeared agreed on the positive contribution of the IT portfolio to organisational performance. As with the definition of IS, such a high level of agreement between key participants augurs well for IS planning and implementation in CRB1.

### **Needs of Organisation**

As part of the IS investment decision making process, it is essential to understand the needs of the organisation and appreciate how IS may satisfy those needs (Ward and Peppard 2002; Pearlson and Saunders 2004). Two of the three participants, P7 and P9, believed that the portfolio as it stood only partially met the needs of the organisation. Both suggested that CRB1 has under-invested in its IT portfolio over the last five years, particularly in infrastructure. It's partly because of this realisation that CRB1 recently embarked on a massive infrastructure upgrade project. P8 however disagreed to a certain extent, suggesting rather that the organisation has achieved significant growth over the past five years and that this was an indication that the portfolio was meeting the needs of the organisation.

### **Impact of IT Portfolio**

Despite apparent differences of opinion on some issues, all three participants strongly agreed on the fact that IS investments have had a significant impact on

organisational performance in CRB1 and that this impact has, in the main, been positive (Mckeen and Smith 1993a).

According to P8:

*“Ah, absolutely! I mean there are some areas that I can very specifically point that have made a very significant contribution without this, we wouldn't have a bank essentially... Our challenge is actually to take the variability out of it.”*

In addition, all three participants reflected on past failures of particular IS projects, but suggested that although the proposed outcomes of those projects may not have been achieved, these experiences were an invaluable part of the organisational learning process (Wood et al. 2004). Lessons learned from these failures have since been channelled to produce improvements in project management disciplines and thus contribute to the organisation's experience with IS (Andreu and Ciborra 1996).

When asked where this impact had been most significant, P7 and P9 suggested that TPS, which are the main source of revenue, appear to have received the greatest attention. According to P7:

*“...it's the transactional systems that are clearly driving our revenue, so I'd say 70% to 80% of our revenue comes through those systems and that underpins our corporate half yearly performance.”*

These views were shared by P8:

*“Well principally, the value is created in the transactional services, because without transactional services you are not doing business.”*

P9 although agreeing with P7 and P8 suggested that Infrastructure deserved to be given greater consideration than was currently the case due to the fact that it formed the foundation upon which all other systems were built:

*“You go back to it that without infrastructure you don't have anything. It's the platform that everything builds on...Where the real value though comes is once you've got your infrastructure in place, it your applications where*

*the value add comes because that is the product or service that you are offering or the transaction you are processing that the bank earns it income on."*

The foregoing lead to the conclusion that the most significant impact of IS investment in CRB1 has been in areas relating to Customer service quality, product delivery and operational efficiency, with much less attention being paid to impact on staff as evidenced, to certain extent, by the lagged investment in infrastructure (Table 7.12).

Participant	Area	Example
P7, P8 and P9	Operational efficiency	<ul style="list-style-type: none"> <li>• Automation of POR and other front office functions</li> <li>• Automation of Back office and other support functions</li> </ul>
P7, P8 and P9	Customer Service Quality	<ul style="list-style-type: none"> <li>• Account queries</li> <li>• Customer Relationship Management</li> </ul>
P7, P8 and P9	Product Delivery	<ul style="list-style-type: none"> <li>• Electronic Banking</li> <li>• Online banking</li> <li>• Telephone banking</li> </ul>
P7, P8 and P9	Staff	<ul style="list-style-type: none"> <li>• Training</li> <li>• Morale</li> <li>• Satisfaction</li> </ul>

Table 7.12: Emergent set of intermediary variables and their areas of impact in CRB1

As noted in other cases within this research project, these areas of impact form a set of intermediary variables that bridge the gap between IS investment and organisational performance in the conceptual model and appear to moderate this relationship. The indirect nature of the IS investment and organisational performance relationship was confirmed by the meta-analysis (Chapter 3). Further, the nature of the variables suggests that they will experience some form of interaction amongst themselves.

Thus, for CRB1, this research not only confirmed the presence of the IT portfolio component of the conceptual model, it also demonstrated its suitability and practicality as a mechanism for identifying the level of IS investment in an organisation. Further, the research identified and confirmed the set of intermediary



variables that was deduced to moderate the relationship between IS investment and organisational performance.

Organisational Performance

Table 7.13 provides a summary of KPIs, both internal and external, identified by participants as the ones utilised by CRB1.

Internal	<ul style="list-style-type: none"> <li>● Customer, e.g.             <ul style="list-style-type: none"> <li>○ Surveys</li> <li>○ Satisfaction</li> <li>○ Products per customer</li> </ul> </li> <li>● Staff, e.g.             <ul style="list-style-type: none"> <li>○ Morale</li> <li>○ Turnover</li> <li>○ Commitment</li> </ul> </li> </ul>
External	<ul style="list-style-type: none"> <li>● Financial Indicators, e.g.             <ul style="list-style-type: none"> <li>○ Return On Investment</li> <li>○ Return On Equity</li> <li>○ Net Interest Income</li> <li>○ Non Interest Income</li> <li>○ Cost to Income ratio</li> </ul> </li> </ul>

Table 7.13: Summary of internal and external KPIs as used in PC1

**Key Performance Indicators**

According to participants P8 and P9, CRB1 utilises financial measures such as ROI as KPIs. Thus, according to P8:

*“We use pretty much ROI, and all that...A big focus in the banking industry which is quite interesting, is the Income to Expense ratio as an efficiency indicator. Its funny, you don’t see that in many other industries. In banking its seems to be this very big thing.”*

P9 concurred and added that:

*“Clearly we have a big focus on Return On Investment. At the end of the day, as a public listed company, our shareholder is a key stakeholder, but*

*we drive a Balanced Score Card in the organisation. So we look at the financial metrics, we have our staff metrics, we have our customer metrics and we have our community metrics.”*

In addition, P9 further indicated that CRB1 utilises other measures such as the Dow Jones sustainability index and Sydney Morning Herald’s Good Reputation Index as an indicator of stakeholders’ perception of CRB1 (D’Souza and Williams 2000). Thus, the use of such indicators is in keeping with the recognition of the role of stakeholders and their potential effect on CRB1. This argument finds support in the literature through Stakeholder theory as discussed in Chapter 4 (Freeman 1984).

Further, discussions with participants showed that the KPIs in Table 7.13 may not always be specifically considered during the IS investment decision making process, a characteristic that might be considered to be weakness in the IS investment decision-making process. However, as noted by P9:

*“I think your strategic intent will always be your biggest driver about what you do and what you don’t, because not every organisation has the same strategy. And how it executes this strategy can be more different than the strategy itself. So I think it’s one of the levers but its not the determining factor. The bigger determining factor is your strategic intent.”*

P8, on the other hand suggested that IS specific KPIs might come into consideration during the IS investment decision-making process as follows:

*“Absolutely, in the whole IT section there are IT specific measures on productivity. The way it sort of works is like a cascade. So we try to construct the high level BSC, each of the areas then take their part, the classic way of doing it, and we can always improve on it.”*

Despite the foregoing, CRB1 appears to have strong project management disciplines and processes in place with respect to IS projects, particularly the larger ones, which ensure that appropriate management control is exercised in order to obtain successful outcomes that in turn may contribute to improved organisational performance. P9 highlighted the foregoing as follows:

*“Well I mentioned before about our governance framework and every project going through a business case. We have a central program office whose role is to monitor and track every program in the organisation. So on a monthly basis, there is the tracking of costs etc of the various projects, spend are monitored. Then we have a benefits realisation process that is linked as part of the business case.”*

It should be noted that IT governance is an issue that is gaining in prominence within both the academic and professional communities (Korac-Kakabadse and Kakabadse 2001). In CRB1, this ‘governance framework’ appeared to offset any apparent weakness in the IS investment decision-making process with respect to the apparent lack of a priori consideration of organisational KPIs. In addition, strict cost management and cost recovery regimes, such as Activity Based Costing, have been implemented that enable CRB1 to ensure that IS investments do indeed pay-off in the form of increased or better performance (Bazley et al. 1993).

Thus, participants concurred that IS investments have had a significant and positive impact on the CRB1’s performance. P8 had the following to say with respect to the performance effects of IS investments:

*“Absolutely. Two things, you can think of IT as a service provider and if you are doing that you will get average performance... When IT works in partnership with the business that’s when you get better performance.”*

And P9:

*“...it’s a cost reduction and a revenue generation capability. So it comes back to our earlier conversation around portfolio programs. To have to meet your strategic intent you are always going to be tackling inefficiency and productivity of the organisation”*

Consequently, it may be concluded that IS investments were considered to have had a strong and positive impact on CRB1’s performance. Of note was the fact that, despite this obvious performance contribution, there did not appear to be any key organisational KPIs that were specifically considered during the IS investment decision making process.

*Considerations for Strategic Information Systems Planning*

Discussion with participants revealed that CRB1 engaged in Strategic Information Systems Planning (SISP) on a regular basis and that such planning was critical to the ongoing operations of CRB1. Consequently, planning activities in CRB1 occurred at two levels: 1) the strategic planning level and 2) the operational planning level. Thus, CRB1 utilised a three-year planning horizon for strategic plans with one-year operational plans for implementation. P9 described the foregoing process as follows:

*“CRB1 has an annual three year strategic process. What I mean by that is our financial year runs 1st October to 30th September. So typically, around March/April, we will be looking at the following three years. And in about June/July we will determine our annual operating budgets for the following year, but in the context of the three year direction...It’s a rolling three year plan. That’s probably the best way to describe it. But it is reviewed annually.”*

Specifically with respect to SISP, P8 outlined the process as follows:

*“The way the bank works is, we run our essentially strategic planning process that works, up to the board, on a six monthly basis. In July we have what we call board strategy review which is we do work to formulate our strategy for the next three to five years right. We present that to the board in July. Then the first year of that strategic focus actually forms the basis for doing the plan for the next financial year. In December, what we do is we review and say, how did we go over the last financial plan year and how are sitting against that strategy and then what we do is we recycle through that.”*

It was evident from discussions with participants, including the foregoing comments, that CRB1 had a very strong focus on costs and that budgets were used comprehensively as a management control tool to ensure that CRB1 met set performance targets. According to P7 and P8 one ratio in particular appeared to have gained prominence in use within CRB1 and that was the Cost to Income ratio.

Despite the existence of a SISP process, it was noted from discussions with P8 that there was no separate IS strategic plan, but rather that the IS plans were a part of the overall corporate plan:

*“...its not like here’s a separate IT plan of what we are going to do and here’s the business. They are put together...its very business driven. There isn’t a separate IT plan to the business plan.”*

This in itself may not be ideal and might result in a situation where the focus on IS was such that IS was relegated to an operational/support role, as opposed to an active strategic role (Willcocks, Feeny and Islei 1997; Ward and Peppard 2002). Although evidence from CRB1 suggests that the foregoing may have been the case, it was clear that this perspective of IS was changing. Evidence of this change in perspective was found in the fact that many IS activities that had been fully outsourced were now being brought back inhouse, through the process of selective outsourcing, with the realisation that IS can (and does) play a strategic role in the organisation (Willcocks, Feeny and Islei 1997; Ward and Peppard 2002). This change in IS management strategy may have been due in part to the effectiveness of the SISP process that was rated an average of three (3) out five (5) with participants acknowledging that there was room for improvement.

It can therefore be deduced from the foregoing discussions that the IS planning process was carried out in tandem to and was a part of the corporate planning process. More importantly, all participants indicated that all nine considerations for SISP were present and critical to the SISP process as shown in Table 7.14.

Factor	Status
Definition of IS	Present
Tracking of IS investments	Present
Factors influencing investment decisions regarding IS	Present
Originators of IS initiatives	Present
Calculation of return on IS investments	Present
Alignment of IS investment with Corporate strategy/goals	Present
IS for competitive advantage	Present
Efficient/Effective utilisation of IS resources by organisation	Present
Development of policies for IS (Architectures, technologies etc)	Present

Table 7.14: Status of factors that make up the considerations for SISP in CRB1

The presence of the all nine consideration for SISP in CRB1 provided important practical support to the literature and in turn provided strong support for the conceptual model. In addition, the inclusion of the SISP component in the conceptual model was thus justified as it demonstrated the relevance of this component to determining the level of IS investment (Earl 1993; Weill and Olson 1989). P9 commented on the validity of these considerations as follows:

*“Oh absolutely, I mean you are always wanting to understand where you are at with your current program, you always have a trade-off as I said about what factors are going to influence your investment decisions, what’s happening in your external environment...I mean that’s really where he would focus. So yeah I think they are all relevant points around this issue.”*

In terms of Earl's (1993)'s five approaches to SISP, it was clear from the research that CRB1 utilised an organisational approach to SISP. This strategy appeared to be well matched with CRB1's centralised hierarchical organisational structure (Galliers 1990; Ward and Peppard 2002).

Thus, for CRB1, this research confirmed the presence of the considerations for SISP component of the conceptual model. All nine variables that constitute the considerations for SISP were observed to be present in this case. In addition, the results clearly demonstrated that this component of the conceptual model provided the 'feedback loop' that in essence completes the IS investment and organisational performance relationship and hence provides a mechanism for evaluating the effectiveness of prior IS investments in terms of their impact on organisational performance.

### *Managerial Effectiveness*

Table 7.15 illustrates the results obtained regarding the Managerial effectiveness component of the IS investment and organisational performance model in CRB1.

Factor	Impact (Low, Med or High)
Senior management commitment to IS	Medium
Firm experience with IS	Medium
User satisfaction with IS	High
The organisation's internal political environment	High
The organisational structure	High

Table 7.15: Presence and impact of the factors that constitute Managerial effectiveness

From the interviews with participants in CRB1, it was evident that the first factor relating to senior management commitment to the effective/efficient utilisation of IS was rated as having a medium level on IS investment decision making. It was deduced that this rating could have been due in part to a possible lack of a full appreciation of the role that IS investments plays in the organisation (Seddon, Graeser and Willcocks 2002). Thus, this rating was expected to have been higher and was therefore considered inconsistent with earlier observations regarding the high status of IS within CRB1. However, P7 provided a possible explanation as follows:

*"I'd say by and large the business executives feel that they are not getting full value, but they believe that without it their jobs would be difficult to perform"*

This was corroborated by P8 and P9, who both suggested that, in the past, senior management may not necessarily always have had a favourable view of IS:

*"I think so. Whether it is welcomed with open arms or not is another question, if technology is seen as a necessary enabler to delivering the business..."* (P9)

Further, P8 suggested that there was a measure of organisational learning required to change senior management's perspective of the role of IS within the organisation (Wood et al. 2004). Thus according to P8:

*"Yes, I think is sort of a mixture, because you will have people that have a good appreciation that see its power and then there's others that see IT as*

*a cost. So its mixed, but compared to say 10 years ago, its vastly improved.”*

In spite the foregoing, it was evident that this commitment was still perceived to be important to IS investment decision making in CRB1 (Pearlson and Saunders 2004). This lent strong support for the first factor within the Managerial effectiveness construct (Markus and Soh 1993). As P8 commented:

*“Yes, I think that without a commitment, it’s paralysis and you slow the clients.”*

The second factor in this component is the level of experience with IS of the organisation as a whole. Despite the fact that CRB1 is a mature FI that has been using IT for a long time and one in which IT is now pervasive and ubiquitous, the level of experience achieved only a medium rating by the participants. According to P8:

*“Yeah, its good, I’d still say that its in the middle ground because I’d say there is a generation change with people that really know and understand. But compared to other industries, I’d say the appreciation in financial services is probably larger than in other industries.”*

Though this relatively low rating (in comparison to maturity of CRB1) may not appear to provide the best foundation for IS investment (Weill and Olson 1989), CRB1 may be commended for having in place structures and processes that compensate for this apparent shortcoming. Given the dynamic nature of technology it is noteworthy to highlight the fact that CRB1, as a mature organisation, has endured the various ‘eras’ of MIS from mainframes, through mini computers and personal computers to the modern era of the networked computers (Willcocks and Lester 1999). P9 commented on this aspect and its effect on the level of technological experience of CRB1:

*“I think it varies a lot across the space. I mean...we’ve grown up in mainframe production systems, so I think we are quite adept and experienced in using large mainframe applications. Where we are still learning in the game is in the mid-range capability”*



Clearly there is an opportunity for greater investment into IS related training for staff in the organisation to improve the level of organisational experience in IS. P7 further noted that as staff became more conversant with IS and its potential, they would undoubtedly become more productive:

*“Oh absolutely, I think that people who are running the business with a good appreciation of aspects of technology results in better performance. People in technology with a better appreciation of business outcomes and drivers leads to better performance.”*

P9 also noted that there were no appreciable differences in IT experience between management and staff in general. This suggested that past investments in training have benefited all levels of staff within the organisation. One aspect that was not discussed specifically (though suggested indirectly) was the loss of experienced technical staff through attrition and other means over time and its attendant implications for organisational experience with IS.

All participants rated the third factor ‘user satisfaction in IS’, particularly that of external users (customers) as being very high in CRB1. According to P7:

*“Very high! We have one of the highest customer satisfaction ratings, in fact we have the highest customer satisfaction ratings of all the banks of our Internet portal including our consumer and business banking. We’ve been voted number one by many for our products, information quality of pictures on our site and things like that. So we are highly rated.”*

P9 concurred saying:

*“We typically run in the 70% range. It varies of course by way of demographic segments, but typically 70% would be the average.”*

In summary therefore, user satisfaction is an important factor in the Managerial effectiveness component. The foregoing lends support to other research reported in the literature (DeLone and McLean 1992; Seddon 1997). However, the question as to what constitutes the user satisfaction factor remains. Organisations such as CRB1 have encountered this problem and have utilised composite instruments, in the form

of customer surveys to measure and report on this factor (DeLone and McLean 1992; Pitt, Watson and Kavan 1995; Seddon 1997).

Turning to organisational culture issues, participants in CRB1 acknowledged the existence of internal politics and its possible influence on performance. Their responses on these issues are summarised in Table 7.16.

P7	<i>"Ah of course it is! But no more or less than in any other organisation. The usual amount of noise goes on, and if you were a member of the board, you'd want that. You'd want vigorous debate going on about this."</i>
P8	<i>"Oh yeah, you always have that sort of stuff. It's all to do with the size of the company, be it private or public sector. The bigger the company is the more politicians it attracts, so we've got plenty of those."</i>
P9	<i>"Internal politics always has an influence in a bureaucracy of a large organisation. So who you are, what influence you have, what business you are doing will always have a bearing and an impact in the IT space, what share of the pie you get"</i>

Table 7.16: Responses regarding the impact of politics on IS investment decision making in CRB1

Clearly, the participants in CRB1 did not perceive internal politics to have a negative impact, but rather that it was constructive in that it engenders debate as to the merits or otherwise of IS investment decisions within the organisation. Wood et al. (2004) strongly support these observations. Conversely, it can be deduced that the positive impact was high as this factor did influence IS investment decision making. Lastly, the organisational structure was perceived to have a high impact on IS investment decision making as discussed earlier.

Thus, for CRB1, this research confirmed the presence of the Managerial effectiveness component of the conceptual model. Observations indicated that the five factors that constitute Managerial effectiveness had a medium to high level of impact on the IS investment and organisational performance relationship.

### Context

As with other FIs operating in the Australian FSS, CRB1 is affected by a range of contextual issues that, to a greater or lesser extent, influence its behaviour. Discussions with participants elucidated varying responses in this regard. P7 and P8

both highlighted the 'Four Pillars' policy and government regulation as having a profound effect on the FSS in general and CRB1 in particular (Wallis et al. 1997; Harper 2000). According to P7:

*"I'd have to say in this market, the most significant strategic issues are the 'Four Pillars'"*

and, P8:

*"...the really big one obviously besides the Australian market {is} Government regulation around the four major banks, which is called the 'four pillars' policy."*

Thus, the effect of government regulation cannot be understated particularly as it could result in quite significant mandatory IS expenditure necessitated by the need to attain regulatory compliance (Harker and Zenios 2000a). P9 on the other hand identified customers and other stakeholders as having a strong influence on FIs:

*"...we talked earlier about customer expectations...And there is a complete mismatch in my mind between customer expectation and aspiration and the reality of the modern financial institution...The analyst and investment community are putting huge pressure on every public listed company for double digit growth year in and year out regardless of the economic environment..."*

These observations highlighted the fact that CRB1 engaged in discretionary IS expenditures to meet the needs of various stakeholders and thus enabling it to compete effectively (Markus and Soh 1993). These observations of CRB1 were in keeping with observations in the other cases in this research where the two issues of discretionary and mandatory expenditures were also established.

On the question of whether IS investment decisions have had a significant impact on CRB1 itself internally or its environment, Participants highlighted the decision to implement an open standards based Internet Banking system as an example. Discussions around this issue appeared to lend support to contentions in the literature that information and information technology can change the way organisations compete (McFarlan 1984; Porter and Millar 1985; Mckeen and Smith 1996; Ward

and Peppard 2002). Thus, for CRB1, this research confirmed the influence of an organisation's environment on the IS investment and organisational performance relationship.

Having thus verified the individual components of the conceptual model in CRB1 in the foregoing sections, the final section of this case analysis discusses the derivation and extension of the conceptual for CRB1 through the application of the foregoing analyses.

### **7.3.3 Extended Conceptual Model for CRB1**

The results indicated that the extended conceptual model derived for CRB1 was identical to that derived for PC1 as shown in Figure 7.2 and discussed in Section 7.5. Thus, the extended conceptual model exhibits the characteristics of the original conceptual model and the additional set of intermediary variables derived from the research.

The first component to be verified was the IS investment component. Discussions with participants confirmed the existence and appropriateness of the IT portfolio, as a mechanism for understanding an organisation's past and potential IS investments (Weill and Olson 1989). Further, the research confirmed that this IT portfolio could be perceived to consist of three levels of IT, infrastructure, TPS and MIS, each having differing impacts on IS investment and consequently attracting differing levels of IS expenditure. This observation confirmed the validity of the IT portfolio concept as presented in Chapter 4.

The research also confirmed the existence of the Organisational performance component in the conceptual model. The findings suggest that CRB1 utilises KPIs that are predominantly financial in nature to report on its performance. These KPIs are a subset of a wider range of standard financial measure that all FIs utilise to report their performance not only to the regulatory authority but to other stakeholders as well (Freeman 1984; APRA 2003).

Internally, the use of KPIs was less formalised and appeared to be dependent on CRB1's need to report on those aspects of its activities that were deemed to reflect its

health, such as customer or staff satisfaction (Stacey 1993; Pitt, Watson and Kavan 1995). However, there was little suggestion that these KPIs were an a priori consideration during IS investment decision making.

As in PC1, the emergence of a set of intermediary variables constituted a significant finding for this research. The set of intermediary variables consisted of: 1) Operational efficiency, 2) Product delivery, 3) Staff, and 4) Customer Service quality. Chapter 10 expands on and discusses these variables and their implications to FIs in detail.

The considerations for SISP component was also verified. All participants in CRB1 agreed that SISP plays a critical role in the IS investment decision-making process. In order to maximise the potential benefits of SISP, CRB1 has adopted an organisational approach to SISP that results in centrally planned IS strategies (Earl 1993). P8 in particular emphasised the necessity of these IS plans for resource acquisitions including financial, technical and human resources (Ward and Peppard 2002).

Regarding the factors that constitute this component, it was observed that the 'definition of IS' was not considered a critical consideration, compared to some of the other factors. It appears that this factor was considered a 'given' and that everyone 'understands' what IS are. However, the definitions provided by the participants seemed to indicate that this factor may not be as simple to define as it might appear on face value. Clearly, a better understanding of what constitutes IS may be helpful in determining appropriate technologies for IS investment (Boaden and Lockett 1991).

Second, CRB1 has implemented processes, such as Post Implementations Reviews (PIRs) and Benefits Realisation Management to facilitate tracking of IS investments (P7 and P8). This presence of this factor increases the probability of success of IS implementations and therefore augurs well for future IS investments (Lin and Pervan 2002). According to both P8 and P9, organisational memory relating to past failures is long term and hence the need to ensure that there is a strong linkage in the secondary relationship between IS investment and organisational performance (Andreu and Ciborra 1996).

Third, it appears that the 'Factors influencing investment decisions regarding IS' relate to the main drivers in the corporate plan (CRB1 2003a) such that CRB1 continually seeks to have strong alignment between the business issues and IS investment (Ward, Griffiths and Whitmore 1990; Earl 1993). This factor is also closely related to the seventh factor in the set of factors that comprise the considerations for SISP construct (Table 7.14).

Similarly, the results suggested that, in CRB1, it was the business units that were the 'originators of IS initiatives' for IS investment through their business projects which in turn required IS enablement (Ballantine, Galliers and Stray 1996). Consequently, participants were in agreement with regards the fact that the business model adopted by CRB1 has changed over the years from one that was primarily technology driven to the modern one in which business issues lead IT issues (Ward and Peppard 2002).

The use of financial indicators and budgetary controls (P8 and P9) ensured CRB1 accounts thoroughly for all resources. However, it was evident that the 'calculation of return on IS investments' factor was problematic and participants indicated that in many cases the methods used may not be the most ideal, but their use persisted for want of better tools (Renkema and Berghout 1997).

As alluded to earlier, the 'alignment of IS investment with corporate strategy/goals' is closely related to the third factor in the considerations for SISP. Discussions with all participants indicated that there is strong practical support for the need to align IS and corporate strategies, although, it should be recalled that CRB1 did not have a separate IS strategy but rather that this strategy is a subset of the corporate strategy thus ensuring maximum alignment (Ward and Peppard 2002). These results regarding the importance of strategic alignment of IS with corporate strategies were in keeping with the literature, particularly Henderson and Venkatraman (1993) who extensively explored the merits of aligning IS and business strategies.

Many researchers have discussed competitive advantage (Porter 1985; Barney 1997) in general and the use 'IS for competitive advantage' in particular (King, Grover and Hufnagel 1989; Narayanan 2001). Thus the literature is replete with examples of organisations using IS for competitive advantage, however many of these examples are situations in which competitive advantage is achieved ex post, such as the classic

American Airlines and SABRE case, as opposed to it being an a priori consideration during the implementation of a given IS (Robson 1997). CRB1 on the other hand is prime example of an organisation in which the use of IS are considered ex ante through the SISP process.

Miller and Doyle (1987) discussed the effectiveness of IS in the FSS. Harker and Zenios (2000b) also discussed the performance effects of IS in FIs. Thus the 'efficient/effective utilisation of IS resources by organisation' factor is an important one within the considerations for SISP construct. Evidence from the research confirmed the importance of this factor to SISP as it clearly indicated that CRB1's investment strategy for IS has been directed at achieving process effectiveness/efficiency.

Lastly, P8 alluded to criticality of ensuring the "development of (appropriate) policies for IS (architectures, technologies etc)". The issue of IS policies (as part of an overarching governance framework) has been growing in importance over the years (Korac-Kakabadse and Kakabadse 2001). Clearly, this factor is one that can and does contribute to organisational performance by enhancing an organisation's competitive position through the application best proactive in the selection, implementation and management of IS (Mckeen and Smith 1996; Robson 1997). This makes this factor an important component of the SISP construct and lends practical support to this theoretical construct.

The research also confirmed the presence of the Managerial effectiveness component. Discussions with participants showed that the factors that make up this component (senior management, commitment to IS, firm experience with IS, user satisfaction with IS, the organisation's internal political environment, and organisational structure) were perceived to have a medium to high level of impact on the IS investment and organisational performance relationship in CRB1. Clearly, this has significant implications for a FI as it highlights the role of management and its influence on the IS investment and organisational performance relationship.

From a contextual perspective, it was observed that CRB1 faces similar regulatory and competitive pressures to other FIs in the Australian FSS (Thompson 1996; Gizycki and Lowe 2000; RBA 2000). Consequently, CRB1 may engage in either

mandatory or discretionary IS investments (or both) depending on whether it is responding to regulatory or competitive pressures (Horvitz and White 2000).

In summary therefore, the data collected from the case was applied to the original conceptual model and enabled the deduction of an extended conceptual model of the relationship between IS investment and organisational performance for CRB1. The results clearly confirmed the existence of the components of the conceptual model, enabled the elucidation of a set of intermediary variables and thus strengthened the conceptual model by demonstrating its grounding in and support from the literature.



## **7.4 Commercial/Retail Bank Case 2**

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### **7.4.1 Case Description**

CRB2 is part of a large and diversified international financial services group. It is a public listed company and is rated one of the top 50 FIs in the world (CRB2 2002). Thus, CRB2 is part of a mature organisation that has grown (and continues to grow) both organically and inorganic.

The financial services group has five lines of business consisting of: 1) three regional operations, 2) Wealth Management and 3) Wholesale Financial Services. These are supported by global functions such as Information Technology, Finance, Human Resources and Risk Management<sup>8</sup>.

CRB2 has invested significantly in IS in the past and appears set to continue to do so into the future. All of its lines of business have an Internet presence and are able to support a wide variety of transactions (CRB2 1999), both personal and corporate in this manner. Thus, the use of technology in CRB2 has resulted in a multitude of delivery channels being developed and marketed successfully to the public.

#### *Data Sources and Participants*

Three participants took part in the study as shown in Table 7.17 and their interview constituted the primary data for the case. In addition, a substantial amount of secondary data was also collected for analysis.

As with the other cases, initial contact with CRB2 was established informally with the IS SBU through the process of selective/theoretical sampling. Once contact was established, a liaison was nominated and discussions engaged which resulted in the nomination of participants for the interview process. In this case the nominated participants were, the head of the IS department – General Manager (Technology), the Chief Financial Officer, CFO and the General Manager (Channel and Process Optimisation) who was nominated as a proxy for the CEO. Interviews were

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<sup>8</sup> Specific details cannot be provided for confidentiality reasons

conducted over a two-day period, each ranging between 60 and 90 minutes. In addition, a parallel process for secondary data collection was carried out with the assistance of the liaison prior to, during and after the interviews.

Data Source(s)	Summary
Participant 10 (P10) – GM Technology	Interview transcript
Participant 11 (P11) – GM Channel And Process Optimisation	Interview transcript
Participant 12 (P12) – GM Finance	Interview transcript
Contact Summary P10	Field notes – Participant 10 interview
Contact Summary P11	Field notes – Participant 11 interview
Contact Summary P12	Field notes – Participant 11 interview
Annual Reports and Financial Statements	1997 – 2003
Financial Summaries	Summaries of key financial data and half yearly results for fiscal years ending March (1997 – 2003)
Newsletters	Information regarding CRB2 and its activities as reported for customer benefit
CRB2 Website	Variety of documents and information regarding CRB2's; <ul style="list-style-type: none"> <li>• Customer services</li> <li>• News and information</li> <li>• Products and services</li> <li>• Information for Shareholders</li> </ul>

Table 7.17: Data sources and participants from CRB2 case

### *Products and Services*

CRB2 provides a wide range of commercial and retail products to over three million customers across Australia (Table 7.18). Like many contemporary organisations, CRB2 has organised its functional areas into a number Strategic Business Units: 1) Business/Corporate, 2) Agriculture, 3) Personal, 4) Asset finance/management, 5) Credit cards, 5) Payments, 6) Channel and process optimisation, 7) Shared services and 8) Business development (CRB2 2002).

In summary therefore, CRB2 was a large and mature FI operating in the Australian FSS that has made significant investments in IS, thus making it an ideal candidate for research into the IS investment and organisational performance relationship.

Private Banking	Home loans
	Insurance – home, car, travel etc
	Personal credit cards
	Personal loans
	Investment and Superannuation
	Personal transaction accounts
	Savings accounts
	Foreign exchange and international payments
	Personal banking
Business and Corporate	Finance and capital
	Cash flow management
	Property
	Insurance
	Investment and Superannuation
	International
	Business Advisory services
	Financial markets
	Custodial services
	Corporate/business cards
	Managed investments

Table 7.18: Illustrative products and services offered by CRB2

The second part of this section (Section 7.4.2) presents the case analysis for CRB2, followed by the application of data and subsequent derivation of a conceptual model for this case (Section 7.4.3).

## 7.4.2 Case Analysis

The presentation of the case analysis for CRB2 begins with observations and field notes from interview participants. The case is developed through a comprehensive analysis of the organisational structures and the how these may affect the management of IS activities. This is followed by a component-by-component review of the conceptual model with respect to CRB2 culminating in an extension of the conceptual for CRB2.

*Observations and Field Notes*

**Participant 10 (P10) – GM Technology**

As the head of the IS SBU in CRB2, P10 displayed a broad understanding of the organisation as a whole and was very clear on the separation of issues between those that relate specifically to CRB2 and those that relate to the group as whole. Consequently, P10 viewed the role of the IS SBU as that of a *partner* and not as a *supplier* to other SBUs in the organisation. P10 also displayed a very strong focus on the technological issues that pertained to the industry in general and CRB2 in particular.

One aspect that was particularly poignant during the interview was the concept of IS governance (Korac-Kakabadse and Kakabadse 2001). This issue appeared to be particularly topical for CRB2. It appeared that this issue was gaining increasing importance in CRB2, possibly because of a corresponding increase in focus on corporate governance within CRB2 (CRB2 2002).

In addition, it was evident that there was some internal conflict (Wood et al. 2004) due to the overlap in roles caused by aspects of the structure, whereby one unit was specifically responsible for IS and another had a quasi-IS role by virtue of the fact that much of its operations were driven and supported by Information Technologies. This issue is explored in more detail later in discussions relating to the structure and size of CRB2.

**Participant 11 (P11) – GM Channel and Process Optimisation**

The Channel and Process Optimisation unit had responsibility over back office functions and product distribution channels (CRB2 2002). This area was very technology intensive, due partly to the sheer volumes of transactions processed and the fact that many products/service are reliant upon technology for their successful delivery. Consequently, this unit has assumed a quasi-technology role, resulting in some degree of overlap with the IS department. This overlap appeared to be a source of potential conflict between the two units (Wood et al. 2004). Discussions with participants seemed to confirm this situation. Further, discussions with P10 and P11

indicated that both participants are aware of this issue and have become adept at managing it. However, despite this apparently obvious issue, it was not clear why CRB2 maintained the status quo.

Finally, P11 appeared to be very knowledgeable with respect to IT and its application in banking. P11 was also observed to be very product oriented as might have been expected given P11's role in CRB2.

### **Participant 12 (P12) – GM Finance**

Discussions with this participant indicated that P12 had recently been appointed to this role and was coming to grips with the multitude of issues around this role. Further observations of this participant showed a strong internal focus. In addition, P12 discussed at length issues pertaining to IS governance (as did P10) and the need for much stronger disciplines around project management particularly in those areas that involve IS.

Furthermore, P12 appeared to be in no doubt as to the impact that IS investments can have on organisational performance, particularly Management Information Systems to which P12 made continuous reference. Hence, P12 suggested that there were many opportunities for the application of IS investments to gain further performance improvements. In this regard, P12 appeared intrigued by the concept of an IS investment threshold and how that might be used to manage and plan for IS investments.

### ***Structure***

It was evident that CRB2 had a hierarchical structure that was divided along functional lines. Thus, CRB2's group corporate strategy was driven by five customer-facing SBUs represented by<sup>9</sup>:

1. CRB2 (in Australia)

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<sup>9</sup> Names of SBUs have been altered for confidentiality purposes.

2. Regional Subsidiary bank
3. Wealth management
4. Corporate banking
5. European subsidiary banks.

Figure 7.5 shows the organisational structure of CRB2's group of companies and depicts CRB2 as the commercial/retail banking operation in the Australian FSS (CRB2 2002).

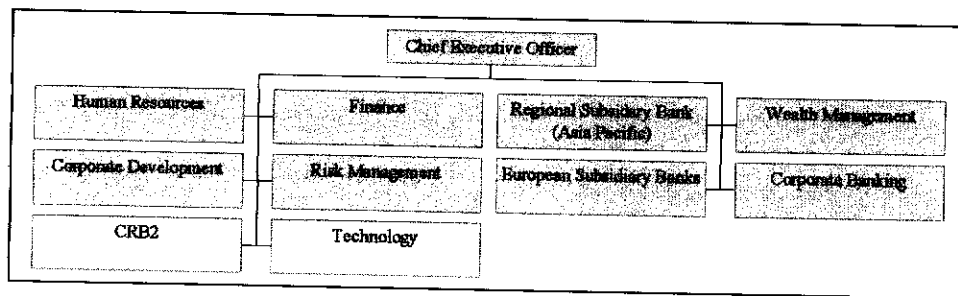


Figure 7.5: CRB2 organisational structure

Further, analysis indicated that a uniform structure had been adopted for each of the five lines of business to ensure more efficient and consistent implementation of the organisation's corporate strategies (CRB2 2003b). Thus, each line of business' structure incorporated similar SBUs covering: a) Personal banking, b) Business banking, 3) Customer service quality and Operational efficiency, 4) Payments, 5) Asset Finance and Fleet Management, 6) Marketing, 7) Agribusiness, 8) Cards, and 9) Channel and process optimisation.

These five lines of business were supported by a set of functional areas covering: 1) Human Resources, 2) Corporate Development, 3) Finance, 4) Risk management and 5) Technology.

Figure 7.6 illustrates the CRB2's corporate IS structure. As can be seen, the holding company has an overall IS structure such that each line of business has a supporting IS function. All IS functions reported to the Group CIO who in turn reported to the Group CEO.

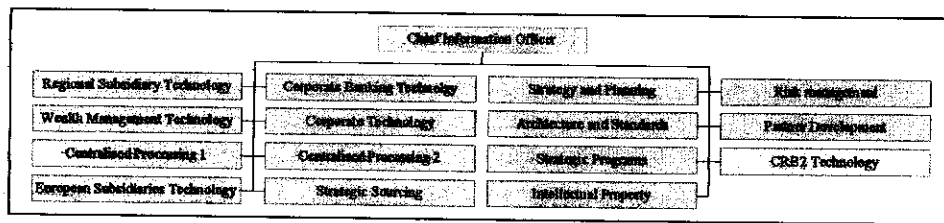


Figure 7.6: CRB2 corporate IS structure

The IS department in CRB2 was led by a General Manager who reported directly to the CEO of CRB2. This ensured that the IS department's important role and status were recognised in the organisation, including direct representation at an executive level (Avison, Cuthebertson and Powell 1999).

### Dimensions of Organisational Structure

CRB2 had a basic hierarchical structure that displayed a high level of both horizontal and vertical differentiation (Robbins 1987). In addition, CRB2 utilised a hybrid structure that incorporated a matrix structure over and above the basic hierarchical structure. This hybridisation of structures was deemed most efficient/effective in enabling CRB2 to manage its complex business activities (Mintzberg and Quinn 1996). Furthermore, and as an indication of its size, CRB2 also displayed a high level of spatial differentiation through its geographically dispersed POR network right across Australia.

In addition, CRB2 was a mature organisation that displayed a high level of formalisation. Consequently, CRB2 was observed to be a highly centralised organisation, a characteristic that may tend to encourage a degree of bureaucratisation within the organisation's processes and procedures (Robbins 1987).

### Size

CRB2 has experienced good growth and has a strong outlook for the future as reported in its annual reports and financial statements (CRB2 2002). Thus, net profit had increased 14.40% in the 2001/2002 financial year. Net Interest Income also grew during that period (6.20%) with total revenues increasing to 6.60%. Similarly, Non-

interest income grew (7.20%) and was a reflection of the drive by FIs to increase income from revenue streams other than simply relying on interest income. On the expense side, the Cost to income ratio had decreased 1.20% remaining under the benchmark 50% and total staff (Full Time Equivalent) decreased by 3% (CRB2 2002).

Thus, it was observed that CRB2 had invested significantly in IT and this in turn had translated into some of the significant reductions observed in operating expenses quoted above (CRB2 2002; CRB2 2003a). Like other FIs, CRB2 has seen reductions in its POR network that have been compensated by increased traffic in other delivery channels, such as ATMs and Internet banking. According to CRB2 (2002), less than 10% of all of its transactions are now performed through its branches bearing strong testament to the importance and criticality of IS investments within this FI.

### *Managing IS Activities*

As alluded to earlier, CRB2 is a large FI that is part of an even larger group of companies. Consequently, managing IS activities not only involves technology management but also the management of a complex set of relationships both within CRB2, and across group. Two reasons may be postulated, the first being that the structure of CRB2 is complex, utilising as it does a mix of hierarchical and matrix structures that facilitate segmentation of the functional units along business lines. Secondly, there is a transfer and cross-pollination of resources across the group such that resource use is maximised. This includes activities, such as centralisation of processing, that enable the group to extract the maximum return from current and future IS investments. For example, CRB2's IS department manages core data centre operations including the costs of purchasing and maintaining hardware for the Asia-pacific region. Simultaneously, there exist within CRB2 some stand alone and 'specialist' systems that are operated by specific SBUs for their specialised operations, but which are indirectly supported by the IS department.

Furthermore, a unit exists within CRB2 that has a quasi-technology role by virtue of the fact that much of its operations are heavily reliant on technology. According to P11:



*“We have a strange quasi-IT role within CRB2 which is that we are sort of the informed buyer that sits between the retail groups and the technology division. So we are just kind of like a layer between their demand and the supply side on the technology front. So we tend to do a lot of the investment planning out of my division in terms of what discretionary spend is going to happen and give input a lot of the capacity management development type discussions. So its not a pure technology function”*

The foregoing and other discussions with participants highlighted the fact that this overlap in roles may be a source of potential conflict (Stacey 1993). However, it appeared that the protagonists understood the prevailing situation and worked closely to ensure that any issues that may arise from this overlap were dealt with satisfactorily and practically. It was not clear why CRB2 maintained the status quo given the importance of the two units and the fact that the overlap was (an acknowledged) potential problem.

### *Investment In IS*

#### **Motivation for IS Investment**

According to participants, IS investment strategies are devised with the aim of supporting business strategies. According to P10:

*“...the development of comprehensives plans/strategies to what we want to do and how technology is going to be deployed to enable business to achieve what we want to achieve and what opportunities there are for the business to improve its performance through using technology...”*

Thus, in CRB2, the main motivator for IS investments was performance enhancement by targeting key areas of the organisation for improvement.

*IS Investment Threshold*

The question of the existence of an IS investment threshold elicited mixed reactions. All three participants acknowledged the existence of such a threshold and agreed that this concept could be a useful tool in understanding the IS investment and organisational performance relationship. One participant (P10) was explicit and suggested that the threshold existed in the range of 10% to 20% of total expenditure:

*“I think there are emerging industry norms that seem to be with a number of FIs around the world with the common nature of how it relatively costs us to buy technology and the relative common probability, a level of at least between 10 and 20 percent of expenditure seems to be necessary in a modern financial services organisation.”*

The foregoing was in keeping with results obtained by Bender (1986). However, the two remaining participants were not able to quantify this threshold. P11 had this to say about the IS investment threshold:

*“I think there probably is and it’s related to chunks of capability that you get for that... If you don’t spend that money you are not going to survive too long.”*

P12 on the other hand was more cautious, suggesting instead that more time would be needed to consider and quantify this threshold. This was in keeping with the fact that this participant admitted to not having considered the existence of such a concept prior to these interviews:

*“Don’t know, would be the answer. I would need to go back and look at what our spend has been. I believe there is a threshold, I think by virtue of the fact that...our business is so heavily reliant upon technology to deliver capability and I think that will continue. I think the fact that there is an ever increasing need for making our technology, how our customers interact with us through the different channels – internet banking, electronic banking, giving our bankers access to information around the customers that they are looking after. The fact that products change so*

*frequently, there's re-pricing, all of those factors, there has to be a minimum level of investment. But what it is, I don't know."*

As alluded to earlier, the foregoing supports early research in this field including that of Bender (1986) and others such as Cron and Sobol (1983) and Harris and Katz (1989). These results therefore suggested that well managed IS investments could and did strongly influence organisational performance. Significantly, it was evident that all participants considered the concept of an IS investment threshold to have practical implications for the management of IS. These deductions were further supported by assertions by P10 that the benchmarking of IS expenditure levels was rapidly becoming an accepted tool for comparing IS utilisation across industries such as the FSS (Trice and Treacy 1986; Mckeen and Smith 1993b).

The next sub-section discusses the individual components of the conceptual model with respect to the data collected from CRB2.

### *IT Portfolio*

#### **Definition of IS**

Despite the fact that CRB2 is a mature organisation that has not only invested significantly in Information Technologies, but has been using these technologies for a long time, it was evident that formal definitions of what constituted IS and IT did not exist in the organisation. Consequently, this raised questions as to the efficacy of IS investment processes (Kauffman and Weill 1989). However, in spite of the foregoing, it was clear that there was a measure of congruence in the individual definitions provided by participants that in turn suggested a high level of agreement and understanding in the senior management team about what constitutes IS. This situation therefore augured well for future IS Investment and management (Kauffman and Weill 1989; Seddon, Graeser and Willcocks 2002).

Specifically, when the question of defining what constitutes IS and IT and hence the constitution of the IT portfolio was presented to the participants, the following responses were received.

P10:

*“...we have tried to use the most general statement we have in the bank is Technology in the bank is anything that runs on a microprocessor.”*

P11 on the other hand responded as follows:

*“I guess most broadly it is the set of systems and tools that are used by our frontline staff and head-office folk to deliver to their customers' and their internal customers' expectations. So IS is anything to do with a system or tool, it applications, its CRM, it's the data centres that are needed to support all of that, it's the databases that pump data in, it's the whole infrastructure.”*

Lastly, P12 provided the following:

*“...we define Information Technology...that's in a bit of a traditional sense, most people would think it in terms of both hardware and the software capability that's required to deliver information to the organisation. Its pretty broad I think, but most people...would think of it as basically hardware and software that together deliver information to the organisation. Some would also probably see it as the organisation that sits around that capability as well, so... end user support, controls, the robustness of the information, but that's pretty much it I would think.”*

Thus, P10's definition in the strictest sense described IT, where as P11 and P12 both took a broader perspective and provided definitions that were more akin to that of IS presented in Chapter 2.

### **Rating of Various Components of IT Portfolio**

As specified in the research instrument, participants were asked to rate the various components of the IT portfolio in order to determine which component(s) contributed most to organisational performance and in so doing develop and better understanding

of the IS investment and organisational performance relationship and how/where to maximise IS investments.

Participant	Ratings of Importance		
	Infrastructure	Transaction Processing Systems	MIS
P10	2	4	3
P11	3	5	4
P12	5	5	5
Average	3.3	4.7	4

Table 7.19: Participant ratings of relative importance of IT portfolio components

Table 7.19 shows the participants' responses, which indicated that all participants agreed that the TPS component of the IT portfolio contributed the most to CRB2's performance. These ratings were hardly surprising given that the TPS are the systems that process all transactions that carry value from which CRB2 earns income (Horvitz and White 2000).

The second highest rated component was the MIS component. However, despite the apparently high rating, two participants, P11 and P12, considered MIS to be an area that required the most improvement whereas P10 disagreed suggesting the TPS component instead. The focus on MIS by P11 and P12 was not remarkable however, given the maturity of CRB2 as one would expect that as an organisation matures, emphasis shifts up towards the pinnacle of the IT portfolio (Galliers and Sutherland 1991).

### Needs of Organisation

Discussions with participants indicated that they all perceived IS investments (current and future) to contribute positively towards CRB2's performance. In addition, and as alluded to in the preceding sub-section, all participants suggested that there were areas of the IT portfolio that required improvement. According to P10, the portfolio as a whole required improvement:

*"There's always opportunities to improve. It operates today effectively... but in each area we continue to seek new ways and we are continuing to*

*look for new ways particularly new ways to deliver our service to customers.”*

P11 and P12 on the other singled out MIS as being the area that required the most improvement, which was to be expected given their roles in CRB2, as follows:

*“Broadly, yes with much more room to go in the MIS.”* (P11)

and:

*“I think it is in degrees. I think you’d find that for most people in terms of the organisation, the biggest capability gap would be around the MIS component. Followed then by the transaction processing component and what I mean by that is some of the old legacy systems that are running are fairly dated.”* (P12)

Hence, this research confirmed the presence of the IT portfolio component of the conceptual model in CRB2. In addition, the results indicated that, although the IT portfolio broadly met the needs of the CRB2, some areas, such as MIS, were identified as requiring improvement to further enhance their contribution to organisational performance. Thus, the results indicated that the relationship between IS investment and organisational performance is such that a minimum level of (continuous) investment is required and therefore the concept of an IS investment threshold was supported.

### **Impact of IT Portfolio**

Discussions with all participants revealed that there is a strong belief that the impact of IS investments on performance is positive. For example, P10 had this to say about benefits realisation with respect to IS investments in CRB2:

*“Well, benefits should start coming through almost immediately. In a good project, one that you are doing because you want to do it not because you have to do it. That, therefore is driven by benefit and those benefits should start to accrue pretty quickly. In fact, if they are not*

*tangible and real and you can see them happening, then you often know you shouldn't be investing so speculatively...So the theory is we should be able to see the benefits coming through pretty quickly, there should be no reason for a delay."*

It was therefore evident that the impact of IS investments on organisational performance was positive, though indirect. In essence, it was found that IS investments were typically directed at specific areas that in turn influence performance (Table 7.20).

Participant	Area	Example
P10	Operational Efficiency	<ul style="list-style-type: none"> <li>• Automation of branch and other front office functions</li> <li>• Back office functions</li> <li>• Support of Ancillary systems</li> <li>• Computer Centre Operations</li> </ul>
P10 and P12	Customer Service Quality	<ul style="list-style-type: none"> <li>• Customer Statements</li> <li>• Account queries</li> <li>• Customer Relationship Management</li> </ul>
P10, P11 and P12	Product Delivery	<ul style="list-style-type: none"> <li>• Electronic Banking (ATM, Credit Cards etc)</li> <li>• Online banking</li> <li>• Telephone banking</li> <li>• Face to Face Delivery</li> </ul>
P11 and P12	Staff	<ul style="list-style-type: none"> <li>• Training</li> <li>• Morale</li> <li>• Satisfaction</li> <li>• Management Information Systems</li> </ul>

Table 7.20: Emergent set of intermediary variables and their areas of impact in CRB2

Thus according to P10, the areas upon which IS investment has the most impact were:

*"...customer service, basically in terms of delivering to the products to the customer... I think that it also has a big impact on record keeping and on the cost of record keeping and the ability to maintain records."*

P11 agreed and further suggested that IS investments also impacted on staff and hence their ability to service customers:

*“Ultimately it’s the people who sit in front of the customers, the line people who have that relationships with the customers as well and undoubtedly the customer as well. They are a stakeholder in accuracy and access and channels in particular.”*

P12 concurred with both assessments:

*“I would say, customer and product delivery...I think there is an external and internal view. I think there is a customer impact which really is how we deliver products and information to our customers across different channels and so on. The internal component is more the management information capability.”*

In summary therefore, it was clear that IS investments are critical to the performance of CRB2. However, it remains that IS investments are but one aspect of CRB2’s diverse array of income generating activities, consequently it is extremely difficult to ascribe causality, at this early stage of the research, between IS investment and organisational performance.

Thus, for CRB2, this research not only confirmed the presence of the IT portfolio component of the conceptual model, it also demonstrated its suitability and practicality as a mechanism for identifying the level of IS investment in a FI.

### *Organisational Performance*

#### **Key Performance Indicators**

It was evident that CRB2 utilised and reported on a wide variety of KPIs. Some possible reasons inferred for this situation were:

- As a public listed company, CRB2 is obliged to report on its performance at regular intervals to satisfy both market requirements
- In order to meet regulatory requirements
- For internal management purposes



Thus, P12 described a range KPIs utilised by CRB2 as follows:

*"I'd probably break that into our external measures which is what we report to the market, and then I'll give you a second part to that answer in terms of what we use internally as well in terms of our own management reporting. Externally it's the classic financial measures... Internally, its probably more towards the balanced score card components... we look at a lot of product information as well..."*

These comments were supported by P10:

*"Well, the most common is the Cost to Income ratio. It is the most levelling single definitive statement, because everything else gets to be very, at the most macro, that sort of averages itself out. Everything else depends a bit on things like the number of lending per loan or this or that, or other ideas that might be used at an operational level to see how we are going on a comparative level so cost to income is the key one..."*

and P11:

*"Customer satisfaction, market share,... share of wallet, profitability, revenues, bad and doubtful debts and non-lending losses, certain capital related measures around efficiencies such as Cost to Income Ratios, EVA type measures, ROI and ROE... there has to be a balance between financial and non financial and stakeholders within the enterprise... how we measure performance and how the analysts measure our performance {is different}, they are pretty much more boldly around numbers and that sort of stuff."*

The discussions of and around the KPIs used in CRB2 emphasised that a variety of KPIs are used due to the wide variety of stakeholders involved (D'Souza and Williams 2000). This may be attributed to the fact that CRB2 is a public listed corporation and consequently had obligations to a variety of stakeholders to whom it was obliged to provide frequent reports on its status.

Table 7.21 summarises some of the identified the KPIs as utilised in and by CRB2.

Internal	<ul style="list-style-type: none"> <li>● Customer, e.g. <ul style="list-style-type: none"> <li>○ Surveys</li> <li>○ Satisfaction</li> <li>○ Products per customer</li> <li>○ Profitability per customer</li> </ul> </li> <li>● Staff, e.g. <ul style="list-style-type: none"> <li>○ Morale</li> <li>○ Turnover</li> <li>○ Commitment</li> </ul> </li> <li>● IT, e.g. <ul style="list-style-type: none"> <li>○ Benchmarking against Gartner Group</li> <li>○ Price per MIP</li> <li>○ Cost per employee</li> <li>○ Actual vs. Budget</li> </ul> </li> </ul>
External	<ul style="list-style-type: none"> <li>● Financial Indicators, e.g. <ul style="list-style-type: none"> <li>○ Return On Investment</li> <li>○ Return On Equity</li> <li>○ Net Interest Income</li> <li>○ Non Interest Income</li> <li>○ Cost to Income</li> </ul> </li> </ul>

Table 7.21: Internal and external KPIs in CRB2

Despite the apparently large number of KPIs, P10 commented on the fact that very few of these were actually related to or were considered in the IS investment process:

*“...no the macro measures themselves are context, and they are a context of where its going to fit and what it is going to do to our overall portfolio and look.”*

P11 on the other hand had this to say:

*“Absolutely... in the securing of a current or an anticipated financial return or benefit is the sole driver I think of IS spend. So if you can't ascribe benefits today, then you have to be able to in the future otherwise, questions are asked as to whether you should invest in it or not.”*

Clearly, the application of financial management control practices was critical for resource management with respect to IS management in CRB2. In addition, technical performance measures, such as price per MIP, CPU usage etc, were utilised again from resource management perspective but apparently little consideration was given to the actual relationship between IS investment and organisational performance per se.

Thus, for CRB2, this research confirmed the presence of the Organisational performance component of the conceptual model. The research clearly confirmed that there are two aspects to organisational performance, an internal and an external aspect and that in both instances KPIs were largely determined by the information requirements of stakeholders (D'Souza and Williams 2000).

### *Considerations for Strategic Information Systems Planning*

It was evident that CRB2 undertook regular SISP activities that facilitated its IS investment process. This process utilised a three-year planning horizon, with one-year operational implementation. According to P12:

*“Yeah, its pretty much that we have an annual operational or financial planning process which we are starting to kick off and that’s really thinking about what next year’s plan looks like. But at the same time we try to get a three year view...”*

Discussions indicated that the SISP process was carried out in conjunction with the corporate planning process. Thus, CRB2 had a tightly integrated business and IS strategy. This approach to SISP may be classified as an organisational approach and presents a number of benefits to complex organisations such as CRB1 (Earl 1993). According to Ward and Peppard (2002), such integration is necessary if the IS department is to support business functions in carrying out their day-to-day activities.

The SISP process as described by the participants was a complex process with multiple levels of activities that sometimes occur and run concurrently. P10 outlined the process comprehensively as follows:

*“There’s planning that’s done at the project level... The second level... we develop, with the business, certain business initiatives which get planned and there’s a combination of IT projects which are need to achieve that and the business projects in implementing that... We move up a level and we start to get to organisational unit planning, at least at the IT level... We have to take out all we know and say for all that’s happening in the next 3 to 5 years... And to go to the third level, which is really the*

*IT strategy process where at the various levels of the business units, we build an IT strategy...So we have those levels and then we tend to macro roll them up and keep a macro view of the entire CRB2 plan as to how that fits together which is a conglomeration of all the other bits."*

P11 agreed with the process as outlined by P10 and further emphasised the tight integration between business and IS strategies:

*"No, absolutely integral. Essentially the way we do it is, there is no real distinction made between operating plan and investment plan. So investment plan, op-ex, for example, essentially comes out of the same bucket and exerts and opportunity cost on other op-ex...we always start from what we want and work back to the plan after that. So we never start with a dollar figure, we start very basically by saying what is the carry over from last year, what are the mandatories, what are the compliance issues and then we have a layer of discretionary spend under that, which is about the areas we want to invest in...Other key areas like our shared services division do their own business planning out of which fall bits for a share of this that's CRB2 centric."*

It was evident from discussions with the participants that IS was not simply a tool for operational efficiency but rather it was viewed as an integral part of the organisation which made a significant contribution to performance, although at this stage causality between IS investment and organisational performance is not ascribed (Sager 1988; Harker and Zenios 2000b).

Thus, for CRB2, this research confirmed the presence of the considerations for SISP component of the conceptual model. All nine factors that constitute the considerations for SISP were identified to be present and influence IS investment decision making in CRB2.

Table 7.22 summarises participant responses regarding the factors that make up the considerations for SISP component in CRB2.

Factor	Status
Definition of IS	Varied Responses
Tracking of IS investments	Present
Factors influencing investment decisions regarding IS	Present
Originators of IS initiatives	Present
Calculation of return on IS investments	Present
Alignment of IS investment with Corporate strategy/goals	Present
IS for competitive advantage	Present
Efficient/Effective utilisation of IS resources by organisation	Present
Development of policies for IS (Architectures, technologies etc)	Present

Table 7.22: Status of considerations for SISP in CRB2

The results clearly demonstrated that this component provided a ‘feedback loop’ that in essence completes the IS investment and organisational performance relationship as depicted by the conceptual model and that these considerations provide a mechanism for evaluation the effectiveness of IS investment decisions in terms of their impact on organisational performance.

### Managerial Effectiveness

Managerial effectiveness describes the role and effect that management has in influencing the IS investment and organisational performance relationship (Markus and Soh 1993). As discussed earlier, evidence in the literature suggests that higher levels of Managerial effectiveness contribute to higher levels of performance with respect to IS investments (Cron and Sobol 1983; Harris and Katz 1988).

Table 7.23 summarises the responses from participants regarding Managerial effectiveness in CRB2.

As can be seen in Table 7.23, the overall impact of the Managerial effectiveness component was deemed to be high suggesting that this component of the conceptual model strongly influences the IS investment and organisational performance relationship.

Factor	Impact (Low, Med or High)
Senior management commitment to IS	High
Firm experience with IS	High
User satisfaction with IS	High
The organisation's internal political environment	High
The organisational structure	High

Table 7.23: Presence and impact of Managerial effectiveness factors

With respect to the first factor, senior management commitment is now accepted to be a very critical aspect of the IS investment and management process (Seddon, Graeser and Willcocks 2002). This issue gains particular importance in FIs where IS plays a significant role both internally and externally. CRB2 appeared to exhibit a high level of this factor. According to P11:

*"Yes, I think they have...I mean we are talking about a package of works of \$250m that took 24 months and straddled two different MDs of the CRB2 and almost a complete change in the leadership teams, so to have such an enduring and persistent commitment to spend means that the vision was shared by all those people. So I think, I'd have to say yes."*

The forgoing provides strong support for this factor of the Managerial effectiveness component.

Turning to the firm's experience with IS, discussions with participants indicated that CRB2, as a mature organisation, has had considerable experience with IS. According to P10:

*"...its four or five. I mean this organisation just runs with technology, everybody is extremely familiar with technology, with how it works, with the issues surrounding it and so on."*

Evidence exists in the literature to support assertions that higher levels of organisational experience lead to better management of resources (Weill and Olson 1989). This factor is manifested through established processes and procedures implemented by trained and experienced staff. Thus, the presence of this factor contributes to overall Managerial effectiveness in CRB2.

With regards to the user satisfaction factor, it was apparent that this factor did indeed influence managerial effectiveness. According to P10, this level of user satisfaction for internal users (employees) was actually measured and tracked on a regular basis and found to be high:

*“Well the internal users, to start at that point, we do actually track it regularly and try to get their views on that so we can get their perspectives...and its pretty high satisfaction notwithstanding they are incredibly demanding”*

Similarly, the levels of external user (customer) satisfaction were also tracked and measured. Thus according to P10:

*“...we have general satisfaction surveys of our customers that are run by the business which I see every month, in which you can currently interpret IT satisfaction because they will identify the problems have with access or the way things work.”*

P11 went further to indicate that:

*“I’d say that our satisfaction rating for external channels is habitually around the 80% mark. I think if you were to ask you’d find that about 70% of staff would be broadly satisfied with the toolset that we provide them.”*

It was therefore evident from these discussions that user satisfaction, both internal (employees) and external (customers), was perceived to be an important factor that could have a significant impact on IS investment decisions and in some instances, even influencing the nature and type of IS acquired (Thornhill 2003; Krishnan et al. 1999).

As may be expected in large and often bureaucratic organisations, internal politics do exist and influence group decision-making processes, including those relating to IS investments (Wood et al. 2004). However and as noted by P12, internal politics should not necessarily have negative connotations and, if used constructively, could positively influence decision making:

*“My answer is yes. There’s always an element of it... When I use the word politics, I wouldn’t use it in a negative sense, but I think the reality is there will be lobbying for certain things to get up.”*

Wood et al. (2004) refer to this characteristic of organisational politics as a double-edged sword.

P10 also noted that there was an element of conflict that sometimes existed and could have influence IS investment decisions in CRB2. Part of this conflict may have arisen because of the overlap earlier observed between P10 and P11’s spheres of influence:

*“Absolutely. The perception of technology in the organisation can influence how much credence is taken to the technology viewpoint... operationally, it can be a very antagonistic view, so there is a lot of blaming, instead of working together to fix it, you can get situations like that. So it can have a lot of effects on the effectiveness of the technology operation and investment.”*

It may therefore be argued that, to a certain extent, the foregoing discussion applies to all ‘scarce resources’ and may occur in any large organisation, thus highlighting the fact that IS investments are no different from other resources in that regard (Barney 1991; Willcocks, Feeny and Islei 1997). Thus, internal politics and conflict exist because of human and organisational behaviour but if well managed, may produce positive results for an organisation (Wood et al. 2004).

All participants concurred that CRB2’s structure as it stood suited the organisation, but all noted that there was always room for improvement. It was suggested that CRB2 is a very dynamic organisation and that the structure was therefore subject to change in response to changes in the environment and the organisation’s strategy. Wilson (1993) and Whittington (1993) both provide excellent discussions on structure and strategy and how these two separate but closely related issues influence each other. This bi-directional relationship has engendered much debate as to which comes first – strategy or structure. Suffice to say, CRB2 exists in a highly competitive environment and consequently has had to constantly evaluate elements



of both structure and strategy in order to ensure its continued competitiveness (Edey and Gray 1996; Gizycki and Lowe 2000).

Thus, for CRB2, this research confirmed the presence of the Managerial effectiveness component of the conceptual model. The research also showed that the five factors that constitute Managerial effectiveness have a high impact on the IS investment and organisational performance relationship in CRB2 and thus were deemed to strongly influence the nature, type and level of IS investments.

### Context

The FSS in Australia has been and continues to be a highly competitive environment (Gizycki and Lowe 2000). It has shown rapid growth to date and analysts predict continued good growth in this sector (Brown et al. 2002).

As a FI, CRB2 is subject to regulatory pressures. P10 and P12 both concurred on the fact that regulation is a critical aspect of the environment and as such influences the behaviour of CRB2 as a whole. In addition, issues such as competition and the 'Four Pillars Policy' also affect CRB2 (Harper 2000). Thus, according to P10:

*“Well regulation is continually driving us to have to do things, so we have certain mandatory things that we have to do, and secondly regulation influences what we do and how we do it because it may constrain ways that we can operate or whatever... competitive advantage, we are continuing to monitor what our competitors are doing because that influences the choices our customers have and what choices they are making and they are interested in, so we have to keep track of that and we are always looking for competitive advantage.”*

These observations were supported by P12 as follows:

*“The regulatory environment is one of the issues that we face at the moment. And I think that our industry is going to be subjected to more and more regulation and that's placing pressure on our systems in terms*

*of being able to support the regulators is one thing. I think fraud is another one."*

The above suggests that CRB2 makes two types of IS investments as a result of competition and regulation. Mandatory IS investments arise out of regulation whereby CRB2 may be required to acquire or make such IS investments as may be necessary to achieve compliance (Horvitz and White 2000). Discretionary IS investments on the other hand arise out of the need to respond to competitive pressures within the FSS. Decisions relating to these two types of investments will therefore have consequences for IS investment and organisational performance.

Furthermore, the emerging prominence of corporate governance following highly publicised cases internationally (Enron, Anderson Associates) and locally (HIH, One-Tel) has resulted in closer monitoring by a variety of stakeholders (Larkin and Casscles 2003).

In terms of areas for collaboration, participants agreed that although there was potential for collaboration in non-competitive areas such as back-office processing, the reality was that this was not seen as a viable strategy by many FIs for competitive and regulatory reasons. As noted by P10:

*"Globally with back-office processing, there are many instances of institutions getting together to drive economies of scale for items that are non-competitive, that have no individual competitive advantage... cheque clearing, settlement, inter-bank and all of those operational areas in the back-office. I mean there have been issues about whether we can share ATM networks or whether they just interoperate and sharing of equipment."*

P11 concurred as follows:

*"As for collaboration, I guess anything, non privacy non proposition based such as back-office processing, cheque processing and things like that, there'd have to be opportunities for {IT}, I mean markets around the world have central utilities that do a lot of that stuff."*

Thus, participants agreed that IS investments have influenced CRB2, both internally and externally<sup>10</sup> and this research therefore confirmed the influence of context on CRB2's IS investment and organisational performance relationship.

### **7.4.3 Extended Conceptual Model for CRB2**

Based on the foregoing, the resultant extended conceptual model for CRB2 was found to be identical to those derived from the PC1 and CRB1 case analyses as illustrated in Figure 7.2 and discussed in Section 7.5.

Thus the extended conceptual model derived for CRB2 also exhibits the presence the set of intermediary variables (Operational efficiency, Staff, Product delivery, and Customer service quality) at which IS investments appear be targeted and upon which IS investments appear to have the most impact thereby leading to consequent improvements in organisational performance (Chapter 10).

This set of variables suggests that the relationship between IS investment and organisational performance in FIs operating in the Australian FSS is a positive but indirect relationship. Thus, results from the case provided strong support for the components of the conceptual model and demonstrated that the model derived from the case analysis was identical to that obtained in the other commercial/retail banks (PC1 and CRB1) as illustrated in Figure 7.2 and discussed in Section 7.5.

With regards the IS Investment component, the results showed the appropriateness of utilising the concept of an IT portfolio as a mechanism to understand existing and potential future investments in IS. Thus, the IT portfolio represented IS investment at three levels, Infrastructure, TPS and MIS. Analysis in CRB2 indicated that TPS were considered to have the most impact on organisational performance followed by MIS and infrastructure respectively with the level of investment being prioritised and apportioned accordingly.

In addition, this research confirmed the presence of the organisational performance component. Further, the research was able to identify those KPIs that CRB2

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<sup>10</sup> Specific examples cannot be provided for confidentiality reasons.

considered as the best measures of organisational performance. Closer inspection of the KPIs indicated that CRB2, like PC1 and CRB1, utilised predominantly financial KPIs to report on performance externally. It was noted that this set of KPIs was part of a broader range of standard KPIs that are used within the FSS to report to stakeholders such as the regulatory authority, shareholders and customers (APRA 2003). However, there appeared to be less formalisation regarding the KPIs used internally (Table 7.21).

Furthermore, not only did this research confirm the presence and impact of the Managerial effectiveness component on the IS investment and organisational performance relationship, it also confirmed the individual factors that constitute Managerial effectiveness. These were senior management commitment to IS, firm experience with IS, user satisfaction with IS, the organisation's internal political environment and organisational structure. This research clearly showed that these factors have a strong influence on the IS investment decision-making process. Therefore, analysis showed that that Managerial effectiveness does play an integral role in the IS investment and organisational performance relationship and has a high level of impact on this relationship.

Lastly, the research confirmed the presence of the Considerations for SISP component in CRB2's conceptual model. Discussions with participants showed that their perceptions of the nine factors in this component were uniform (with one notable exception – the definition of IS). Thus, the results showed that the Considerations for SISP component did influence the IS investment and organisational performance relationship as depicted by the conceptual model.

As with other the other FIs in the sample, the research showed that CRB2 is also affected by the same regulatory and competitive pressures in its environment which may in turn shape its IS investment decisions (Harker and Zenios 2000a). Two contextual key factors were thus identified, regulation and competition. Analysis suggested that two types of IS investments consequently arise, mandatory (from regulatory pressure) and discretionary (from competitive pressure) IS investments.

In summary therefore, the research in CRB2 indicated strong support for the components of the original conceptual model and has provided results that led to the

extension of the original conceptual model through the identification of a set of intermediary variables that are believed to influence the relationship between IS investment and organisational performance.

The next section presents discussions relating to the derivation of a composite extended conceptual model for the commercial/retail bank industry from a detailed cross-case analysis using the individual case reports presented in Sections 7.2 – 7.4.

### **7.5 Composite Extended Model for Commercial/Retail Banks**

Table 7.24 summarises the key similarities and differences observed in the individual commercial/retail bank case analyses.

Beginning with organisational structures, the commercial/retail bank cases all exhibited similar characteristics with regards their organisational structures. All the commercial/retail bank cases had basic hierarchical structures with CRB1 and CRB2 exhibiting hybrid structures incorporating both hierarchical and matrix characteristics (Robbins 1987; Mintzberg and Quinn 1996). In all of these cases, the organisations were structured along distinctly functional lines. In addition, similarities in the structures suggested that the FIs could have had similar core strategies (Mintzberg and Quinn 1996). This was evidenced by the presence in each FI of a business/corporate banking SBU and a personal banking SBU. Clearly all the commercial/retail banks in the sample consider these markets to be significant and have therefore developed specialised units to address the specific needs of each market segment.

In addition to the customer facing SBUs, each FI had a range of support functions whose services were shared across the entire organisation. The IS department was one such service. However, of the three commercial/retail bank cases, PC1 was the only FI in which there was no direct link between the CIO and the group CEO. Specifically PC1's IS department was part of a shared services unit called Finance and Corporate services. The merits or otherwise of PC1's structure were discussed in

detail in Section 7.2. Suffice to say, this structure may not be the most ideal given the perceived high level of importance of IS in PC1.

ITEM	PC1	CRB1	CRB2
Structure	Hierarchical	Hybrid (Hierarchical and Matrix)	Hybrid (Hierarchical and Matrix)
IS investment threshold	Accepted, but not quantified	Accepted, approximately 10%	Accepted, but no consensus (range: 10% – 20%)
IT Portfolio	Represents IS investments and affects IS investment decision making	Represents IS investments and affects IS investment decision making	Represents IS investments and affects IS investment decision making
Intermediary variables	Operational efficiency Staff Customer Service Quality Product delivery	Operational efficiency Staff Customer Service Quality Product delivery	Operational efficiency Staff Customer Service Quality Product delivery
Organisational performance	Affected by IS investments	Affected by IS investments	Affected by IS investments
Considerations for SISP	Accepted, perceived to affect IS investment decisions	Accepted, perceived to affect IS investment decisions	Accepted, perceived to affect IS investment decisions
Managerial Effectiveness	Accepted, perceived to affect IS investment decisions	Accepted, perceived to affect IS investment decisions	Accepted, perceived to affect IS investment decisions
Impact of Context	Accepted, perceived to affect IS investment decisions	Accepted, perceived to affect IS investment decisions	Accepted, perceived to affect IS investment decisions

Table 7.24: Summary of key similarities/differences in commercial/retail bank cases

In the other two commercial/retail bank cases however, each CIO reported directly to the group CEO, a structure that is generally considered more conducive to the effective, efficient and innovative use of technology (DeCanio, Dibble and Amir-Atefi 2000). It was therefore deduced that the organisational structure factor has a significant impact on the management of IS in general and IS investments in particular. For example, it was noted in PC1 that PC1's ability to understand the true cost of IS was severely limited because its structure allowed some IT to be managed by units other than the IS department. In CRB2's case, the situation was slightly

different with potential conflicts arising from an overlap of roles between to key functional areas with respect to IS. It can therefore be deduced that the level Managerial effectiveness, of which the organisational structure factor is a part, can and is influenced by this factor.

Turning to the concept of an IS investment threshold, it was observed that in all cases, this concept was new to the participants with one notable exception in CRB1. In spite of the foregoing, the majority of participants across all cases agreed with the concept of an IS investment threshold and were able to see the merits of applying such a concept not only to the management of IS investments and but also in trying to relate these investments to organisational performance. Notable exceptions to this were P10 who suggested that the definition of IS investment threshold for an organisation might result in constraints being placed on IS investments to the detriment of the organisation. In most instances, participants were able to provide an estimate of what they believed this threshold to be. Estimates provided by participants indicated that the IS investment threshold ranged between 10% and 20% in the commercial/retail bank cases. This result was extremely encouraging and provided strong support for earlier research (Bender 1986).

With regards the verification of the components of the conceptual model and its extension in each of the individual cases, the results were consistent and strikingly similar. From a research perspective, consistency in results augurs well for the robustness of the research design, the validity (internal and external) and the reliability of the research instrument. Thus, by consistently applying the research instrument and carefully analysing the data utilising the prescribed data analysis techniques the components of the IS investment and organisational performance were verified in each of the commercial/retail bank cases.

First, consider the IS investment component as depicted by the IT portfolio. The extended conceptual models suggest that in each of the FIs, IS investment occurs at three levels, Infrastructure, Transaction Processing Systems (TPS) and Management Information Systems (MIS). This research also established that, in the commercial/retail bank cases, the primary focus of IS expenditure has been at the middle layer of the IT portfolio, the TPS, which may be attributed to the fact that these are the systems that carry value transactions and therefore the means by which

FIs generate revenue. Two out of three of the cases, PC1 and CRB1, acknowledged this outright and in both cases, it was revealed that they were planning to spend significant resources to improve their IT portfolios. CRB2 on the other hand appeared to have overcome some of the issues identified in PC1 and CRB1 and consequently was more focussed on MIS type systems with the express aim of capitalising on existing IS investments and using these to develop closer relationships with its customers. The confirmation of the IT portfolio as a mechanism for representing a FI's level of IS investment was an important result that worked towards the verification of the conceptual model. Further, the confirmation of the existence of the various layers of the IT portfolio supports the utilisation of RBV theory in the development of the conceptual model and the interpretation of results (Chapter 4). For example, it was evident in all the commercial/retail bank cases in the sample that IS expenditures on the various components of the IT portfolio are heterogeneous as they are perceived to have varying effects on organisational performance, with those components believed to have a greater impact on performance receiving a greater proportion of total IS expenditure. This latter aspect also contributes to the difficulty of ascribing causality to IS investments for any improvements in organisational performance (Navarrete and Pick 2002).

A key finding of this research was the emergence through the research of a set of four intermediary variables, Operational efficiency, Staff, Product delivery and Customer service quality. In each case, responses from participants indicated that these were the areas at which IS investments were primarily directed. Improvements in each of these areas were perceived to contribute, either singly or collectively, to improvements in organisational performance. It was noted that each case placed different levels of emphasis on individual intermediary variables in keeping with RBV theory (Barney 1991). This is logical as one would expect such differences to arise as a consequence of differences in the business strategies devised by the FIs in their individual attempts to strive for and achieve differentiation (McKeen and Smith 1996; Pearlson and Saunders 2004). Thus, the results of this research suggested that IS investments have an indirect, but positive, relationship with organisational performance. These results were congruent with the findings of the meta-analysis regarding the nature of the relationship between IS investment and organisational performance (Chapter 3).



From an organisational perspective, it was evident that all of the participants from the commercial/retail bank cases in the sample were convinced of the positive impact of IS investments on organisational performance. Further, it was evident that (as suggested by the conceptual model) IS investment impacted on organisational performance both internally and externally. The difficulty for the FIs in the sample (and indeed for organisations) was (and is) being able to measure this performance with respect to indicators of IS investment.

It was noted that the commercial/retail banks in the sample showed more consistency with respect to the use of external KPIs as they all utilised KPIs that were predominantly financial in nature in line with the reporting requirements of the regulating authority (APRA 2003). Examples of the external KPIs utilised are provided in Tables 7.4, 7.13 and 7.21 and included Return On Investment, Return On Equity, Net Interest Income, Non Interest Income and Cost to Income (Campbell 1992; Carrington, Llanguth and Steiner 1997). Thus, there appeared to be more conformity in reporting on external performance, which was attributed in part to the need to adopt and use financial-reporting standards for both regulatory compliance and for reporting to stakeholders (Bazley et al. 1993; Wallis et al. 1997). There does appear to be a caveat however, and it lies in the fact that even within this regime of standard financial reporting, FIs can still pick and chose those measures that they feel are most indicative of their performance and best understood by the stakeholders for whom the reports are designed (D'Souza and Williams 2000). Internally however, there appeared to be less consistency (and formalisation) on the KPIs used, with a variety of KPIs being utilised depending on the requirements/focus of the individual FI (Freeman 1984). These internal KPIs were categorised into user/customer (such as surveys), financial (such as Actual versus Budget) and technical (such as Service Level Agreements and Benchmarking) categories. Thus, this research confirmed the existence of the organisational performance component of the conceptual model in commercial/retail bank cases and made exploratory inroads into identifying KPIs that could potentially be used to explain the IS investment and organisational performance relationship.

With regards the considerations for SISP component, this research confirmed the existence of a SISP process in each of the commercial/retail bank cases. In all cases,

an organisational approach was adopted for the development and execution of SISP strategies in keeping with the organisation's predominantly hierarchical structures and centralised management (Earl 1993; Mintzberg and Quinn 1996). PC1's approach however did have an added dimension that incorporated a free market approach to IS strategy (Earl 1993). Furthermore, the research was able to confirm the individual factors that constitute the Considerations for SISP component in each FI. As may be expected, the perceptions of the relative importance/impact of each of these individual factors varied between the FIs, but generally led to the conclusion that these factors did indeed exist in the SISP component and did influence the IS investment and organisational performance relationship as proposed in the original conceptual model (Chapter 4). Thus, the verification of the existence of the considerations for SISP component in the individual conceptual models was significant.

The effect of the Managerial effectiveness component of the conceptual model also displayed variances between the commercial/retail bank cases. First (and as discussed earlier), analysis of the organisational structure factor for each FI revealed that all of the commercial/retail bank cases in the sample had hierarchical structures, with CRB1 and CRB2 utilising hybrid (hierarchical+matrix) structures. In addition, there were striking similarities observed in the structures of the commercial/retail banks suggesting similarities in their corporate strategies (Llewellyn 1996; Gizycki and Lowe 2000; Duncan and Elliot 2002). Second, all three commercial/retail banks exhibited a high level of senior management commitment to IS investment. This was expected given the high levels of information intensity and attendant high levels of IS investment exhibited by the commercial/retail banks in the sample. Table 7.25 summarises the responses from all three cases regarding the Managerial effectiveness component.

Factor	PC1	CRB1	CRB2
Senior management commitment to IS	High	Medium	High
Firm experience with IS	High	Medium	High
User satisfaction with IS	Medium to High	High	High
Organisation's internal political environment	High	High	High
Organisational structure	High	High	High

Table 7.25: Presence and impact of Managerial effectiveness factors

highlighted as having a significant impact upon many aspects of their FIs, including IS investment. P12 summarised this succinctly as follows:

*“The regulatory environment is one of the issues that we face at the moment. And I think that our industry is going to be subjected to more and more regulation and that’s placing pressure on our systems”*

Thus, FIs may be required to implement IS to attain compliance as set out by the regulatory authority from time to time as opposed to voluntary investments made as a consequence of their key strategies. Such IS investments were/are deemed mandatory IS investments. All participants in the commercial/retail bank cases acknowledged this as being an issue that could have significant implications for any FI.

The issue of competition was also acknowledged as having a significant impact on the FSS in general and the commercial/retail bank cases in the sample in particular. Banking is therefore a very competitive business and the Australian FSS is certainly no exception (Duncan and Elliot 2002). Thus, FIs may undertake discretionary IS investments to enable them to compete effectively. There was strong concurrence between participants that IS investments have been a significant enabler in this highly competitive environment and in some cases have (and will) change the manner in which they compete (Gizycki and Lowe 2000).

One unique aspect of competition in the Australian FSS is the ‘Four pillars’ policy that is designed to promote competitiveness by preventing mergers between the larger FIs (Harper 2000). This issue has a number of implications for FIs, particularly with respect to their ability to compete/collaborate. When asked whether there were opportunities for collaboration in this highly competitive environment, responses from the participants again showed a high level of congruence. Participants suggested that although there were areas in which FIs did collaborate, such as participating in the payments systems, the ability to collaborate further was restricted. According to P10:

*“I mean, you can and have areas that are non competitive that we worked collaboratively on in the past. Things like credit card authorisation and the payment system where we switch transactions. All banks participate on those parts of the common infrastructure. I see no*

*reason why we cannot extend that to other non-competitive areas of our processing for example.”*

Other participants, although also agreeing with the possibility of collaboration, pointed out that it was difficult for commercial/retail banks to find areas for collaboration.

To illustrate these difficulties, an example was provided of a situation wherein the possibility of consolidation of back office processing<sup>11</sup> was suggested, but was later found not to be viable due to competitive pressures (amongst the commercial/retail banks) and regulation. However, participants agreed that IS did enable commercial/retail banks to differentiate themselves and hence facilitated the attainment of competitive advantage (Powell and Dent-Micallef 1997).

Figure 7.7 illustrates the resultant composite extended model for the commercial/retail banks in the sample.

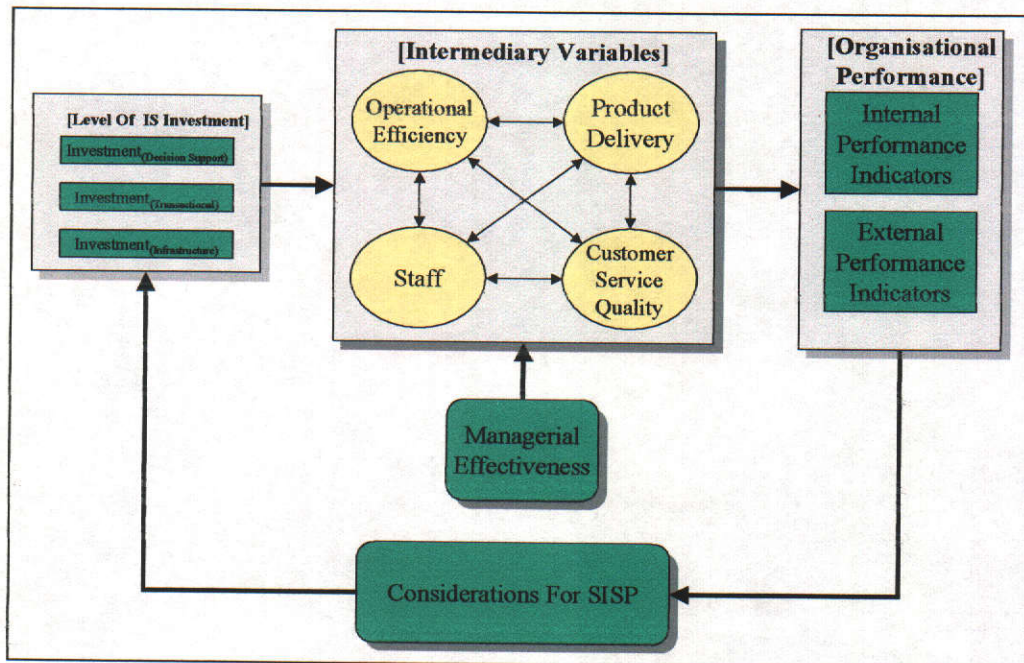


Figure 7.7: Composite extended conceptual model for the commercial/retail bank case

<sup>11</sup> The specific example cannot be quoted for confidentiality purposes.

When the extended composite model in Figure 7.7 is compared to the individual extended results from the individual commercial/retail banks cases, a high level of similarity is observed.

These results are encouraging as they provide strong support for the components of the conceptual model and assist in developing an understanding of how IS investments and organisational performance are related in commercial/retail banks. Further, the consistency of the results also provides strong support for the research design, the case study protocol and associated research instrument.

## **7.6 Chapter Summary**

This chapter presented the commercial/retail bank cases that participated in the research project. Three cases were selected as directed by the case study protocol, one medium and two large sized FIs, with the medium sized FI being used as a pilot case. In each case, three participants were nominated and interviewed. These interviews constituted the primary data. In addition, significant amounts of other data were collected to support the primary data and enable triangulation of data during analysis. This was necessary as one of the key objectives of this research was to identify and verify the components of the conceptual model that represents the IS investment and organisational relationship.

For each of these cases, the data were analysed and applied to the conceptual model resulting in the derivation of an extended conceptual model. Results indicated that the conceptual models of IS investment and organisational relationship derived for the commercial/retail bank cases were similar although some minor differences were noted in the perceptions of the participants regarding some of the factors that constitute the components of the conceptual models. Of particular note was the emergence of a set of intermediary variables upon which IS may impact and thus affect organisational performance. These variables, identified as Operational efficiency, Staff, Customer service quality and Product delivery, suggest a positive but indirect relationship between IS investment and organisational performance FIs and further support observations in the meta-analysis regarding the nature of the IS investment and organisational performance relationship (Chapter 3).

Discussions with participants suggested that different levels of emphasis were placed on each of the intermediary variables by FIs and it was deduced that these differences arose out of the inherent differences in the business strategies devised by individual FIs. Further, it was noted that these variables do not stand in isolation of and subsequent deductions suggested that there was a level of interaction between the variables and that changes in any one or more of these variables were likely to influence changes in the other variables in the set.

In summary therefore, this chapter achieved the four objectives as initially set out in the introduction. First, the case study protocol and research instrument were validated and verified for use in the entire research program. Second, the components of the original conceptual model were verified to be present. Third, the IS investment and organisation relationship was tested and showed the existence of a set of intermediary variables that moderates this relationship in each case. In addition the application of the research instrument enabled the determination of the nature of the relationship between IS investment and organisational performance. Finally, a composite extended conceptual model was derived that depicts the IS investment and organisational performance relationship in the sample of commercial/retail banks drawn from the Australian FSS.

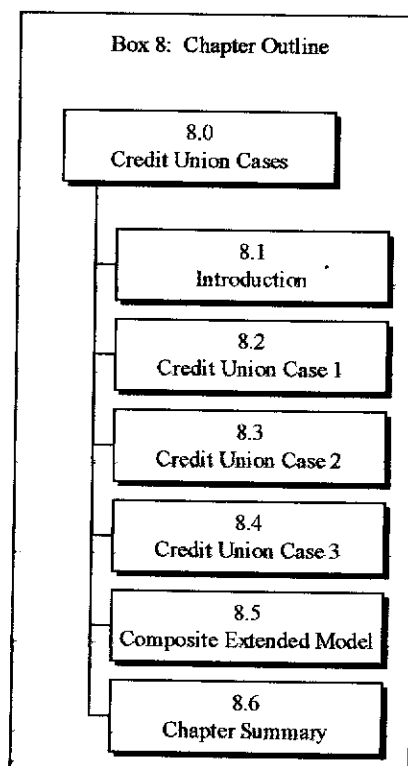
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# 8.0 Credit Union Cases

## 8.1 Introduction

This chapter presents the case reports for the credit union cases in the sample and in so doing achieves the following objectives:

1. Demonstrates further the reliability, validity, relevance and rigour of the case study protocol (and research instrument) as applied in each case.
2. Verifies the presence of the components of the conceptual model in the credit union cases.
3. Presents the results from each of the cases and demonstrates how these results were analysed to derive individual extended conceptual models for each of the credit union cases.
4. The derivation of a composite extended conceptual model that more accurately depicts the relationship between IS investment and organisational performance in credit unions.



Section 8.2 presents the report for the first credit union case, CUC1, followed by case reports for the second credit union (CUC2) and third credit union (CUC3) in sections 8.3 and 8.4 respectively. These individual case reports represent the 'within-case analysis' aspect of the research design as described in Chapter 6. Section 8.5 presents the cross-case analysis and the resultant composite extended model for the credit unions in the sample. The chapter concludes with a brief summary of the preceding discussions.

CUC1 is a small FI that operates in only one state in Australia with a small network of PORs. CUC1 therefore operates in a niche market and has a very well defined target market. CUC2 and CUC3 on the other hand are both much larger credit unions with broader POR networks, although they are also both localised in one state in Australia.

As with the commercial/retail bank case reports in Chapter 7, each case report is presented in three parts, beginning with a case description and followed by the case analysis and the presentation and discussion of each case's extended conceptual model. The case descriptions contain an overview of each case, together with detailed descriptions of data sources, participants and products/services offered by each FI. The case analyses present an analysis of the primary and secondary data collected in each case. Beginning with observations and field notes, followed by detailed analyses and descriptions of organisational structures, how IS are managed in each FI. Each case is developed through the analysis of the individual components of the conceptual model to demonstrate their relationships with each other and the overall relationship between IS investment and organisational performance. Thus, in each of the comprehensive case analyses, participant's views are triangulated and comparative analyses performed using secondary data to achieve further convergence. This aspect constitutes the 'within-case' analysis and results in the derivation of an extended conceptual model for each case.

Finally the individual extended composite models are compared (cross-case analysis) and a resultant composite extended model of the IS investment and organisational performance relationship for the credit union industry is derived. The resultant model will later be used for further analysis and comparison with the commercial/retail bank composite extended (cross-industry analysis) to develop a clearer understanding of the IS investment and organisational performance relationship in the Australian FSS (Chapter 10).



## 8.2 Credit Union Case 1

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### 8.2.1 Case Description

Credit Union Case 1 (CUC1) is a small credit union operating in one state within the Australian FSS. It was founded in the 1960s and, since then, has experienced slow but steady growth. CUC1 has a relatively flat, hierarchical organisational structure built along functional lines (Figure 8.1) with the corporate head office providing administrative and back office functions and a small network of PORs that acts as the front office thereby providing contact with customers/members.

According to the General Manager:

*“It is a traditional credit society and it operates on the traditional credit union values of providing a service to members.”*

This epitomises the basic tenets of the credit union concept (Edey and Gray 1996) and like all credit unions in Australia, CUC1 is member-owned with profits being reinvested into the organisation resulting in reduced fees for members (Crapp and Skully 1985). Thus, the General Manager described this characteristic of CUC1 as follows:

*“Our return to our shareholders is often in terms of service, in terms of lower prices for the products we provide.”*

Being a small organisation CUC1 did not have a formal IS department nor did it have dedicated IS staff, even though most, if not all of its operations are heavily dependent on IT. This unique characteristic differentiated CUC1 from other cases in the sample and made it an intriguing study. However when this characteristic was viewed in the context of the credit union industry in Australia and the fact that core transaction processing for credit unions is provided by Credit Union Services Corporation Australia Limited (CUSCAL), amongst other services, the lack of a dedicated IS department did not seem quite so odd (CUSCAL 2002).

Within the credit union industry, CUC1 is a niche market operator that tends to favour a reactive, but quick follower strategy in general and for its Information

Technology in particular (Porter 1980; Pearlson and Saunders 2004). The General Manager encapsulated this philosophy in the following statement:

*“It {strategy} is not driven by maximising profitability, though it is recognised that the credit union needs to make a profit to accumulate capital.”*

To this the Manager Finance and Administration added:

*“It’s {strategy} driven by a number of things such as the requirements of APRA and generally where our philosophy of personal service to members with as little fees as possible with as competitive interest as possible.”*

This last statement raises the issue of regulation in the FSS, which as has been alluded to earlier, does have a strong influence on FIs in general. In this respect, the FSS in Australia is no different from others around the world (Lilja 1999).

## 8.2.2 Data sources and participants

Table 8.1 summarises the data sources and participants from CUC1.

Data Source	Summary
Participant 1 (P1) – General Manager	Interview transcript
Participant 2 (P2) – Manager Finance and Administration	Interview transcript
Contact Summary P1	Field notes from Participant 1 interview
Contact Summary P2	Field notes from Participant 2 interview
Company Reports	1997 – 2001
IS budget data (1997 – 2001)	IS expenditure data (five year period)
Newsletters	Information on CUC1 and its activities
Website	Variety of documents and information regarding: <ul style="list-style-type: none"> <li>• Member services</li> <li>• News and information</li> <li>• Products and services</li> <li>• Financial statements</li> </ul>

Table 8.1: CUC1 data sources and participants

Contact was first initiated with CUC1 informally through the General Manager. Subsequent to that, a meeting was arranged during which an overview of the research project and its objectives were discussed. In addition, potential participants were also identified in the initial meeting in accordance with the case study protocol and a schedule for the interviews drawn up.

As in the other cases, a liaison was nominated to ensure a single point of contact with the organisation and thus facilitate clear and efficient communication between the researcher and the organisation. Only two participants were nominated to participate as CUC1 did not have an IS department and hence did not have a CIO (or equivalent). However, CUC1 was still considered an excellent case for inclusion in this research project given its extensive use of IT. The interviews of the two participants constituted the primary data. In addition, a substantial amount of secondary data was collected, as per the case study protocol (Appendix 2).

### Products and Services

Table 8.2 lists the products and services offered by CUC1.

Products	Transaction and Savings accounts
	Loans and lending
	Insurance
	Term deposits
Services	Internet/Online banking
	Telephone banking
	Bill paying services
	ATM access
	Travel Money card
	Moneygram
	Foreign exchange services
	Giropost
	Local and international access to personal accounts
	Travel
Cheque	

Table 8.2: CUC1 product and services summary

It was observed that CUC1 was heavily reliant on Information Technology. Despite this reliance on IT, CUC1 did not have an IS department and outsourced much of its technology requirements including all core-processing systems. Consequently, this

situation had the following implications for CUC1 (Frenzel 1992; Willcocks, Feeny and Islei 1997):

1. CUC1 is, to a certain extent, beholden to its supplier of core processing services. However, contractual arrangements are in place to govern this relationship.
2. CUC1 does not have to worry about sourcing or acquiring a core system (layer 2 of IT portfolio), it need only concentrate on ensuring that its infrastructure, and other technologies such as Internet Banking and MIS are in place.
3. Technical support and services can be outsourced at a much lower cost than that of maintaining an internal IS department.

Thus, CUC1 utilises economies of scale and scope arising from its membership of CUSCAL. This effectively enabled CUC1 to offer services and products comparable to and competitive with much larger FIs without having to acquire its own core processing system.

The next section presents CUC1's case analysis and demonstrates how the data was utilised to derive an extended conceptual model for CUC1. Each major component is comprehensively analysed and discussed resulting in the derivation of an extended conceptual model for CUC1.

### **8.2.3 Case Analysis**

#### *Observations and Field Notes*

Two participants were nominated for and participated in this research. The first participant interviewed was the General Manager (CEO) of CUC1 and the second, the Manager Finance and Administration (CFO equivalent). The following subsections are derived from observations made and field notes taken during interviews. As specified in the research design, these observations and field notes enabled the researcher to better understand and interpret participants' responses.

### **Participant 1 (P1) – General Manager**

P1 was the General Manager and reported to a board of directors elected by members of the society (Figure 8.1). Three major observations were made of this participant during the course of the interview by the researcher.

First, although senior management in CUC1 considered IT a necessary requirement for survival, they were not going out of their way to acquire what might be considered superfluous technology. Thus, P1 recognised the critical role that IT plays in any FI and was acutely aware that CUC1 would not be able to effectively/efficiently service its members nor be able to provide the range of products that it does without its IT (Sohal and Ng 1998; Seddon, Graeser and Willcocks 2002). However, P1 was also realistic about CUC1's capacity to acquire IT, and was particularly wary of any possible adverse impacts on capital that extraneous IS investment may have on CUC1's ability to meet the regulatory authority's capital adequacy and statutory requirements (Mishkin 2001).

The second observation related to the direct involvement of both senior managers (P1 and P2) in the management of CUC1's IS activities (Seddon, Graeser and Willcocks 2002). As mentioned earlier, CUC1 did not have an IS department nor did it have any dedicated IS personnel, it therefore appeared that both participants were proud of their ability to cope with and manage day to day IS issues as demonstrated by this comment from P1:

*"I feel that the non-IT managers here would have more IT expertise than non IT managers in a larger organisation, just because in a larger organisation they can go running to the IT department, whereas here we have to take care of everything ourselves."*

This 'pride' may be seen to manifest itself in strong feelings of ownership, community or closeness to and within the organisation by both management and staff as described by Stakeholder theory (Donaldson and Preston 1995) and Organisation theory (Robbins 1987; Wood et al. 2004). This pride appeared to be reinforced by CUC1's adherence to the credit union ethos and the size of the organisation both of which appeared to foster feelings of 'ownership' and a subsequent desire to achieve organisational success that was in turn considered a reflection of personal success.

This too was in keeping with stakeholder theory (Donaldson and Preston 1995). These cultural issues (Davernport, Hammer and Metsisto 1989) were clearly relevant to the utilisation of IS within and by the organisation and consequently held direct significance for the relationship between IS investment and organisational performance as they were part of the Managerial effectiveness component in the conceptual model (Weill 1992).

The third observation related to the lack of a formal IS strategy in the organisation (Earl 1993). As General Manager, P1 was keenly aware of this issue. However, the lack of IS strategy was not seen as an impediment by CUC1 principally because of its size and because it, like other credit unions that are members of CUSCAL, relies on CUSCAL to provide the requisite computing facilities for its core processing activities (TSW 2003; CUSCAL 2003). Thus, CUC1 is able to enjoy the benefits of massive computing power for a fraction of the cost of ownership by maximising the economies of scale and scope generated by virtue of its membership to CUSCAL. This approach facilitated CUC1's reactive and follower strategy with respect to its Information Systems and, to a greater or lesser extent, militated against the need for a formal IS strategy. It was clear that P1 believed that this strategy was ideal for CUC1 given its size and in view of external issues as competition.

### **Participant 2 (P2) – Manager Finance And Administration**

P2's role as Manager Finance and Administration of CUC1 was equivalent to that of Chief Financial Officer in a larger FI. During the interview with P2, a number of observations were made which will now be discussed.

First, P2 appeared very knowledgeable of and optimistic of CUC1's current and future outlook. P2 appeared keenly aware of the strategic and operational issues pertaining to CUC1. The researcher formed the opinion that having someone with this level of knowledge and experience who understands the FSS in general and the credit union industry in particular was extremely advantageous for a small FI, such as CUC1, as P2 provided much needed operational and administrative support to and for the General Manager.

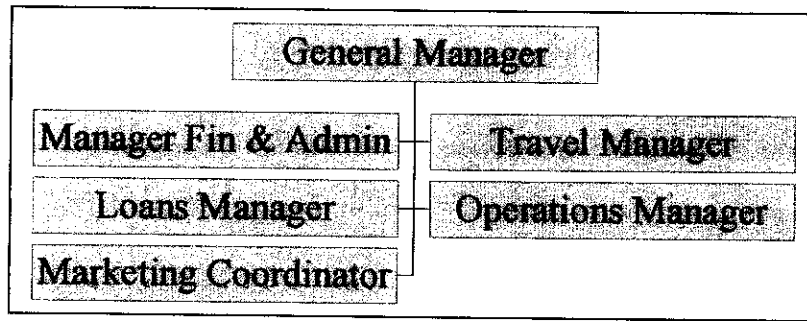
Second, P2 continually referred to an upgrade to the telecommunications infrastructure that was in progress at the time the research was being conducted. It appeared that P2 had taken a personal interest in the project suggesting that P2 could have been one of the main proponents for the upgrade. This personal management style was also evident in P2's description of a 'Management By Walking Around' technique (Mintzberg 2002) whereby P2 takes time to visit PORs and in those areas where there is direct competition, takes the opportunity to visit competitor PORs in order to make first hand observations (Stacey 1993). Applying Stakeholder theory to this behaviour led to the conclusion that P2 was an active stakeholder who saw the success of the organisation as a reflection of personal success (Mikko 1991).

Third, P2 appeared to have some intriguing ideas regarding the future of CUC1, but understood the limitations of CUC1 in terms of bringing these to fruition. There was even a suggestion that some of the ideas might go against the rather conservative approach of the board towards the growth and development of CUC1. Further, P2 showed a preference to an increased use of IS in CUC1 and was quite vocal in supporting the positive contributions of IS investments to the success of CUC1 to date. This led to the conclusion that P2 firmly believed in the importance and criticality of IS investment for CUC1 (Mckeen and Smith 1993b).

Lastly, P2 expressed the same sentiments regarding the lack of an IS department as P1. It appeared that both senior managers agreed that, though the prevailing situation was far from ideal, it is one that they had to accept, as CUC1 simply did not have the wherewithal to create and maintain an inhouse IS department. In addition, P2 created the impression that, although the reactive/follower strategy was ideal for CUC1 in as far as IS investment was concerned, there was a realisation that in many respects this strategy was dictated by the structure of the organisation (for an excellent discussion of issues around structure and strategy, see Whittington (1993)).

### Structure

As mentioned earlier, CUC1 has a relatively flat hierarchical structure that reflects its small size. Thus, CUC1 is led by a General Manager who reports to a board of directors elected by members of the society



.Figure 8.1: CUC1 structure

CUC1 consists of five operating units, Finance and Administration, Loans, Operations, Travel and Marketing. CUC1 has a board of nine directors elected by members that oversees the management of the society.

### Dimensions of Organisational Structure

Applying Robbins (1987) typology of the dimensions of organisational structure to CUC1, it was evident that CUC1 exhibited a high degree of horizontal differentiation. From this it was deduced that there was a high level of functional specialisation (Robbins 1987), this supposition was supported by the existence of distinct functional units. Vertical differentiation, however, was limited and this was primarily a result of the size of the organisation (Robbins 1987). In addition, CUC1 exhibited limited spatial differentiation given that it only had a limited number of PORs in the metropolitan area of a state capital. Observations indicated that the organisation exhibited a high level of formalisation as may be expected of an organisation that has been in existence for over 30 years (Robbins 1987). Lastly, CUC1 was clearly a highly centralised organisation and again this was a function of its structure and size.

Thus, CUC1 had a simple, hierarchical structure with only two levels of management (Mintzberg and Quinn 1996). This structure was probably the most ideal given CUC1's size, as it is flexible with clear accountability. Further, a simple structure of this nature also facilitates faster decision-making. As Robbins (1987, p208) observed:



*“...there is a minimum amount of goal ambiguity because members are able to identify readily with the organisation’s mission and it is fairly easy to see how one’s actions contribute to the organisation’s goals”.*

The most notable feature of CUC1’s structure was the lack of an IS department. Such a simple structure has two main implications for CUC1, (a) from a managerial perspective, it is easy to manage, and (b) from an IS investment perspective, the architecture would be influenced by the structure and would be necessarily simple as well (DeCanio, Dibble and Amir-Atefi 2000). These two implications were observed to hold in CUC1.

#### *Size (as at 2001)*

CUC1 was a small sized FI with assets of approximately AUD \$82 million and over 13 000 members as at end of 2001. Total number of employees (Full Time Equivalent) was less than 50 as at the end of 2002. At the time that this research was conducted, CUC1 had four (4) PORs in the state capital in which it was based and there were no immediate plans to expand that network, although a project was recently undertaken to upgrade the existing branch communications network from an analogue-modem based network to a digital-router based network.

#### *Managing IS Activities*

At the time that this research was conducted, P1 and P2 shared the responsibilities of managing day to day IS functions and (operational) planning for IS. Both participants also reported in their interviews that one senior staff member (non managerial) performed a ‘quasi-support’ role by virtue of experience and familiarity with the core system. Users working together resolved most IT operational problems with both P1 and P2 confirming that they too may actively engage in this activity as well. In addition, CUC1 utilised external organisations for more complicated technical support, installation and implementation activities.

Whilst both participants agreed that the forgoing might not be ideal, they acknowledged that there was a limitation in CUC1's ability to create and maintain an in-house IS department. When queried as to the type of person(s) that they would consider for such a role, P1 stated that:

*"It would be somebody looking at day to day issues. It would be a young person in their mid-twenties, very technically proficient, coming out of university. They would not be involved in strategic business decision making."*

This comment was in keeping with observations that management perceived IT to play a primarily supporting role, as opposed to a having strategic role, in CUC1.

Lastly, by virtue of CUC1's membership of CUSCAL, it outsourced core processing to Co-processing Pty Ltd, a company that runs the Integrated Data Processing Centre, IDPC (CUSCAL 2003)

### *Investment in IS*

To facilitate some comparison with the literature, a set of ratio data (Tables 8.3 and 8.4) were compiled for CUC1 that were similar in characteristic to those used in studies such as Cron and Sobol (1983), Harris and Katz (1989) and Mahmood and Mann (1993).

These data were compiled from secondary data collected in CUC1 as specified by the case study protocol (CUC1 1997; CUC1 1998; CUC1 1999; CUC1 2000; CUC1 2001; CUC1 2002). Though not directly comparable, identifying such ratios at an exploratory level was significant in facilitating the development of the conceptual model and extending existing literature to build a cumulative body of research in this area.

Table 8.3 summarises IS expenditure in CUC1 for the period 1997 – 2001.

Item	Budget/Expenditure Ratios (%)				
	2001	2000	1999	1998	1997
Hardware	7.95	6.88	5.95	4.69	4.43
Software	14.99	12.65	11.71	10.22	9.92
Licensing/Rentals	6.44	10.01	4.98	4.54	4.36
Training	0.88	0.79	0.74	0.67	0.63
Other Operating Expenditure*	69.74	69.67	76.62	79.88	80.66
Totals	100	100	100	100	100

Table 8.3: CUC1 IS budget ratios (percentage of overall expenditure)

IS Expenditure data exhibited a steady increase of approximately 11% from approximately 19% to approximately 30% in the period from 1997 to 2001. This increasing trend was not surprising in light of observations in the literature by many authors who have remarked on the fact that FIs are spending more on IS each year (Carrington, Llanguth and Steiner 1997; Harker and Zenios 2000b). It was also evident that CUC1's IS budget was dominated by software costs, primarily because of outsourcing arrangements followed by hardware and licensing/rentals.

### IS Investment Threshold

One of the key objectives of this research was to establish a threshold for IS Investment in FIs. This threshold is defined by the ratio of the total IS expenditure to total organisational expenditure (Bender 1986). Data regarding the establishment of an IS investment threshold in CUC1 is summarised in Table 8.4.

IS Ratios	1997	1998	1999	2000	2001
IS budgeting as a percentage of corporate budget	12.21	13.80	16.18	16.48	15.43
IS expenditure as a percentage of overall expenditure	13.50	14.53	14.87	16.50	14.71
IS expenditure as a percentage of revenue	12.16	13.75	14.37	15.48	13.82
IS asset value as a percentage of revenue	2.45	3.10	4.56	5.78	6.21

Table 8.4: IS management ratios for CUC1

Analysis of the data in Table 8.4, indicated that CUC1 has an IS investment threshold range of 13.50% (minimum, 1997) to 16.50% (maximum, 2000), with an average of 14.82%, consistent with observations in the literature (Bender 1986).

Bender (1986) described the concept of an IS investment threshold and argued that the identification and use of such a concept would be extremely useful in judging the level of IS investment a FI. Not surprisingly, neither of the two participants had, up to this point, considered the existence of such a threshold. When questions regarding the utility of such a threshold were put to the participants, their responses were equivocal.

According to P1:

*“The threshold as to the amount of expenditure we can incur is really based on the structure of our balance sheet...And the threshold would be that we can’t incur an expenditure level that would eliminate the surplus capital which we have at the moment.”*

The above response indicated that the idea of threshold for IS investment is something that may not have been explicitly considered by this participant. However, P1’s statement conveys the impression that P1 perceived the concept of a threshold to apply in light of the overarching regulatory requirements.

P2, on the other hand, responded thus:

*“I think there is a minimum threshold... you do have to keep up to date with the latest software, some of it obviously imperative if you are to remain competitive... quantifying it could be a little harder... I am not sure at this stage, without looking at some of the figures, whether I can quantify it establish the threshold.”*

Thus, although P2 may not have previously known about this concept, P2 did on reflection consider it to be something that could be very useful in the management of IS investments. P2 was particularly keen to discuss this point in some detail in terms of the implications for CUC1.

IT Portfolio**Definition of IS**

Senior management had very broad definitions of what constituted IT within the organisation. This observation was in line with reviews of the extant literature where the issue of difficulty of definition of IS and IT persists (Weill and Olson 1989). In this case, P1 defined IT as:

*“...the PCs, the core banking system...the software, ...plus the communications network”*

Similarly, P2 defined IT as follows:

*“...the personal computing software and the various informational bits that are held on individual PCs.”*

The foregoing definitions were similar to the definition of IT given in Chapter 2. Although these broad definitions appear to be acceptable (in terms of the broader literature), it is imperative for CUC1 to consider more focussed definitions particularly if they are considering the creation of an internal IS department as the organisation grows and matures.

**IT Portfolio Components Ratings**

After determining senior management’s perceptions of what constituted their IT portfolio, the next step was determine the relative importance of the parts of the IT portfolio as perceived by senior managers so as to determine which aspects of the IT portfolio contributed the most to organisational performance. Table 8.5 shows participants’ responses regarding this issue.

Participant	Ratings of Importance		
	Infrastructure	Transaction Processing Systems	MIS
P1	5	5	4
P2	4	5	5
Average	4.5	5	4.5

Table 8.5: Rating of IT portfolio components

Thus, there did not appear to be major differences in the perspectives of the two senior managers as shown in Table 8.5. It should be noted though, that MIS in CUC1 was very rudimentary, spreadsheet based, and both participants agreed on the need for better Management Information Systems.

### **Needs of Organisation**

In terms of whether the current IT portfolio met the needs of the organisation, the consensus appeared to be that, although it generally met the needs of the CUC1, there was room for improvement. Take for instance the core banking system. Comments indicated that apart from being an ageing system (it has been in use for the past 25 years), it was not based on a Relational Database Management System (RDBMS) and as a result, performing tasks such as extracting member information was complex and this had consequent implications for decision making.

As for IT infrastructure, CUC1 had plans in place for replacing/retiring equipment such as PCs, monitors, printers etc on a regular basis in order to ensure that a relatively up to date infrastructure is maintained. At the time the research was conducted, the CUC1 was in the process of upgrading its telecommunications network from an analogue network to a digital routed network that was envisaged to be more efficient.

It was interesting to note that P1 rated the architecture (overall) as five (out of five) on the argument that the current architecture fulfilled its intended purpose. A cautionary note was raised however when P1 stated that, perhaps, when compared to systems in somewhat larger organisations, CUC1's banking system may be delivering much less functionality.

P2 on the other hand rated the architecture as a four (out of five) in terms of its performance. Despite this high rating, P2 commented that there was a need for significant improvements to the existing systems (Byrd and Turner 2001).

## Impact of IS Investments

A number of areas were identified as being areas upon which IS investments had the most impact with consequent implications for the resultant conceptual model for CUC1. Table 8.6 summarises participants' responses regarding the areas.

Item	Area of Impact	Identified by:
1	Customer service quality	P1 and P2
2	Internal efficiency a. Reporting b. Transaction processing c. Communication	P1 and P2
3	Ability to deliver service	P1 and P2
4	Ability to compete effectively	P1 and P2
5	Staff morale	P2
6	User satisfaction	P2
7	Product cost	P2
8	Product delivery	P2

Table 8.6: Impact of IT portfolio as perceived by participants

These emergent variables were perceived to be important as they form the quintessential link between IS investment and organisational performance in the conceptual model. The existence of these variables is supported by extensive prior research on their effects either singly or in concert on the performance of FIs (Berger and Mester 2000; Harker and Zenios 2000b).

By induction, the areas identified in Table 8.6 were reduced to a much smaller set of variables upon which IS investment was perceived to have the most impact (Table 8.7).

Points of Impact	Item
Operational Efficiency	2, 3 and 4
Customer Service Quality	1
Product Delivery	7 and 8
Staff	5 and 6

Table 8.7: Summary of impact of IT portfolio in CUC1

Arguably, organisations in general, and FIs in particular invest in IS to cause changes in the variables identified in Table 8.7 with the express aim of improving their effectiveness and efficiency, thus leading to higher organisational performance (Thatcher and Oliver 2001).

The foregoing deductions find support in Robbins' (1987) argument that efficiency and effectiveness are proxies for organisational performance, thereby leading to the general supposition that any improvements these areas would have a positive impact on an CUC1's performance.

To further elaborate, Table 8.8 provides examples of some of the products and services that may be affected by the intermediary variables in CUC1 and clearly demonstrates why improvements in these areas may lead to higher organisational performance.

Variable	Example
Operational efficiency	<ul style="list-style-type: none"><li>• Automation of branch and other front office functions</li><li>• Back office functions</li><li>• Cash management</li></ul>
Customer Service	<ul style="list-style-type: none"><li>• Customer Statements</li><li>• Account queries</li></ul>
Product Delivery	<ul style="list-style-type: none"><li>• Online banking</li><li>• Telephone banking</li></ul>
Staff	<ul style="list-style-type: none"><li>• Training</li><li>• Morale</li><li>• Satisfaction</li></ul>

Table 8.8: Products and services affected by the intermediary variables

Thus, for CUC1, this research confirmed the presence of the IT portfolio component and demonstrated its suitability and practicality as a mechanism for identifying the level of IS investment in an organisation.

### Organisational Performance

Discussions with participants revealed that IS investments were perceived to benefit CUC1 by contributing markedly to its performance, to the extent that having a fully functional IS was synonymous with being able to conduct business. According to P1:

*“Definitely, I mean we could not perform without our investments in IT. If there were no IT, there would be no CUC1.”*

P2 concurred saying:



*“If we didn’t, if we weren’t investing and spending money in that area we would not be able to operate as a credit union. Its as simple as that!”*

Both senior managers therefore agreed that IS investments have had a positive impact on organisational performance for CUC1, and there was a strong belief that successful IS will continue to impact positively on performance. CUC1 was a particularly interesting and unique case as it did not have an IS department. The participants both agreed that CUC1 simply could not afford to operate and maintain its own core banking system. Although CUC1 has considered the possibility of acquiring its own TPS, that option was found to be infeasible for a number of reasons, including CUC1’s size and capacity to acquire/maintain such systems. Similar arguments applied to the acquisition of delivery channels such Automated Teller Machines (ATMs) and Electronic Funds Transfer/Point Of Sale (EFT/POS) terminals. However, it should be noted that even though CUC1 does not operate or own any ATMs or POS terminals, its members are able to access these services via those supplied by other FIs. Naturally, the cost of these services to members is an issue that CUC1 has to manage carefully.

Thus, CUC1 was clearly a very good example of a FI using IS to deliver services and products whilst at the same time maximising on the economies of scale and scope that are offered by virtue of its membership to CUSCAL.

### Key Performance Indicators

Table 8.9 lists the KPIs that were identified as being the ones that best describe organisational performance in CUC1.

Internal	<ul style="list-style-type: none"> <li>● Customer                             <ul style="list-style-type: none"> <li>○ Customer Survey</li> <li>○ Complaints register</li> <li>○ Informal (telephone, verbal)</li> </ul> </li> </ul>
External	<ul style="list-style-type: none"> <li>● Financial                             <ul style="list-style-type: none"> <li>○ Return On Assets</li> <li>○ Return On Equity</li> <li>○ Cost to Income Ratio</li> <li>○ Interest Margin*</li> </ul> </li> </ul>

Table 8.9: Key Performance Indicators

*\*Key contributor to profit*

*NB: A monthly uptime report/schedule is provided by the operators of the core banking system but this does not appear to serve any purpose other than informational.*

It would appear that CUC1 did not specifically consider any of the performance indicators as key determinants during the IS Investment/expenditure decision-making process. Rather it would appear that the criteria that eventually determined whether to go ahead with a particular expenditure or not were defined as follows:

P1:

*“To be frank, I mean the financial ones ROA, ROI, CI, we don't explicitly say that “there's \$50k worth of that investment in IT which impacts these ratios”. Its more a question of, what is the value for our customers, Will it increase the service to the best benefit of our members, Can we afford it, in terms of the impact on capital?”*

P2 concurred saying:

*“ I suppose, things on our mind are - why do we need to make that investment? – is it because what we've got is not working properly? -- is it new software that we have to but because all the other credit unions have probably something more competitive to offer to the same service to our members? So I'd say that's the initial mindset that we use not the fact that this will give us a better Cost to Income ratio. I think that is probably more a result rather than a key consideration when we are looking at spending IT monies.”*

These perspectives also typify the customer service orientation (Reynolds and Ochalla 2003) and reactive-follower strategy clearly apparent in CUC1 (Stacey 1993; Pearlson and Saunders 2004).

Thus, the results and analysis from CUC1 suggest that although the KPIs in themselves may not be critical to the IS investment decision making process, they are still useful in so far as they can be used to determine the organisation's capacity to spend on IS (Carrington, Llanguth and Steiner 1997). In effect, what senior management in CUC1 were suggesting was that the resultant value of a given

performance indicator, such as a high cost to income ratio, could in fact be more of an outcome than an actual a priori consideration. One could still argue however, that such an 'outcome' could in essence be treated as a 'target' or 'objective' in a more formalised planning process, thus indirectly making these performance indicators prima facie considerations (Cron and Sobol 1983; Harris and Katz 1989).

In terms of measuring or tracking IT expenditure, CUC1 exercises management control through an actual versus budget management control method, with every item of expenditure being carefully scrutinised on that basis (Bazley et al. 1993). No other methods were evident. In addition, because the organisation was small, there were no separate cost centres and hence no need for elaborate cost recovery mechanisms.

Thus, for CUC1, research confirmed the presence of the organisational performance component of the conceptual model. The results clearly confirmed that there are two aspects to organisational performance, an internal and external aspect with KPIs determined to a greater or lesser extent by stakeholders (D'Souza and Williams 2000).

#### *Considerations for Strategic Information Systems Planning*

There did not appear any significant issues in this regard SISP as this process was not evident in CUC1 as shown in Table 8.10.

Factor	Status
Definition of IS	Not Present
Tracking of IS Investments	Not Present
Factors influencing investment decisions regarding IS	Not Present
Originators of IS initiatives	Not Present
Calculation of return on IS Investments	Not Present
Alignment of IS Investment with Corporate strategy/goals	Not Present
IS for competitive advantage	Not Present
Efficient/Effective utilisation of IS resources by organisation	Not Present
Development of policies for IS (Architectures, technologies etc)	Not Present

Table 8.10: Status of considerations for SISP in CUC1

The organisation was very small and had no IS department, however, an overall corporate philosophy was evident with IS being perceived as an enabler for

organisational performance although there was no formal SISP process (Earl 1993). Consequently, CUC1 adopted a reactive-follower strategy to its IS investment process (Stacey 1993; Pearlson and Saunders 2004).

### Managerial Effectiveness

All five factors relating to Managerial effectiveness were observed as being present in CUC1. The individual impacts as observed are summarised in Table 8.11.

Factor	Impact (Low, Med or High)
Senior management commitment to IS	High
Firm experience with IS	Low
User satisfaction with IS	Medium
The organisation's internal political environment	Low
The organisational structure	High

Table 8.11: Impact of Managerial effectiveness variables in CUC1

Senior management in CUC1 appeared to have a high level of commitment to the use of IS in CUC1. According to P1 and P2, both the role and attitude of management with respect to IS was such that it was perceived to be a positive contributor to performance. In this case, senior management were directly responsible for actually managing and supporting day-to-day IS issues due to the lack of dedicated IS personnel. When the foregoing was analysed in the context of the organisation's size and absence of an IS department, the impact of this issue on the nature and structure of the IT portfolio and ultimately performance became clearer (Mckeen and Smith 1996; Willcocks and Lester 1999).

In terms of the 'firm experience with IS' factor, it appeared that though certain individuals may in fact have had a moderate to high level of exposure to technology, collectively the FI appeared to display a low to medium level of experience with IS. This characteristic may also be attributed to the fact there were no specialist IS staff in the organisation and could thus have certain ramifications for CUC1 going into the future (Andreu and Ciborra 1996). In addition, this characteristic, when combined with the reactive nature of CUC1, may in future pose some difficulty with respect to

keeping up with the changes in technologies given the dynamic nature of IS (Pearlson and Saunders 2004).

Although both P1 and P2 expressed a desire to have specialist IS personnel, at a technical rather than managerial level, both conceded that CUC1 did not have capacity to employ such personnel. In this case, outsourcing the core banking system allows the organisation to enjoy the economies of scale and scope that exist in the credit union industry, thus enabling CUC1 to provide services that it may not be able to otherwise (Robson 1997). Consequently CUC1 does not need to employ full time IS staff to operate and maintain their banking system in order to compete effectively.

As far as the 'user satisfaction factor' was concerned, all indications were that there are no major problems in this regard (both internal and external), with P2 rating existing systems as being generally satisfactory (Segars, Grover and Kettinger 1994; Powell and Dent-Micallef 1997). In fact it would appear that the culture in the organisation towards IS was generally positive, and this negated any potential negative impacts from the 'internal political environment' factor whose presence and impact in CUC1 was, in any case, observed to be very low (Wood et al. 2004).

Finally, with respect to the 'organisational structure' factor, the structure, as at the time the research was conducted, appeared to be the most appropriate for CUC1. It was evident that this last factor has had a strong influence on IS management in CUC1.

Thus, for CUC1, this research confirmed the presence of the Managerial effectiveness component of the conceptual model. Analysis showed that the five factors that constitute Managerial effectiveness do have an (overall medium level) impact on the IS investment and organisational performance relationship by influencing the nature, type and level of IS investment.

### *Context*

CUC1, like other FIs, operates in a highly competitive environment (Gizycki and Lowe 2000; Duncan and Elliot 2002). This environment was therefore perceived to promote the engagement of discretionary IS investment decisions by CUC1 as a

mechanism for competition (D'Aveni 1994). One example of the effect of this contextual factor may be seen in the introduction of Internet banking services by CUC1. Discussions with participants revealed that the introduction of Internet banking has had the single biggest impact on CUC1, both in terms of impact on the organisation itself and its members as well. Consequently CUC1 has noted a steady shift towards the use of online banking and this has had the consequent advantage of enabling CUC1 to reach a much greater and wider proportion of the market than would have been the case had it only relied on its POR network.

In addition, and like other FIs, CUC1 is also affected by regulation within the Australian FSS and this was perceived to result in mandatory IS investments in response to the requirements of the regulatory authority. Thus, for CUC1, research clearly confirmed the influence of an organisation's environment on the IS investment and organisational performance relationship.

### 8.2.4 Extended Conceptual Model for CUC1

Following the application of the data gathered in CUC1, the conceptual model was extended as shown in Figure 8.2.

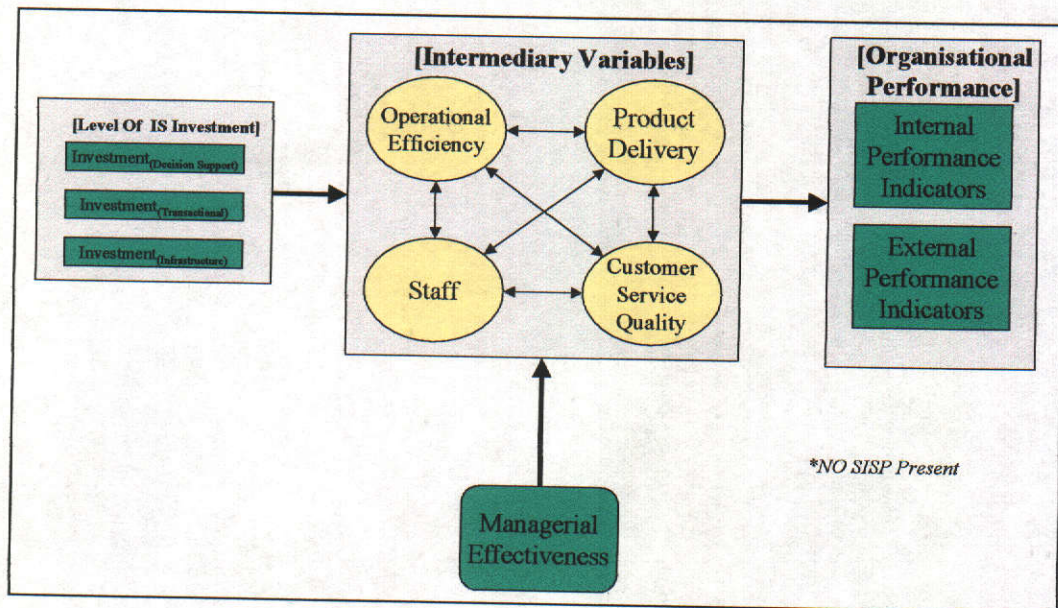


Figure 8.2: Conceptual model extension for CUC1

Comparative analysis between the model shown in Figure 8.2 and the original conceptual model showed that only three of the four components of the original model were present in the extended model for CUC1:

1. Level of IS investment (IT portfolio)
2. Organisational Performance – Internal and external
3. Managerial effectiveness

As can be seen in Figure 8.2, the conceptual model suggests a positive but indirect relationship between IS investment and organisational performance. However, some key differences between the original conceptual model and the extended conceptual model for CUC1 were evident and will now be discussed.

The first significant difference noted between the original and extended model for CUC1 was the absence of formalised Strategic Information Systems Planning (SISP). As previously discussed, CUC1 did not have an IS department, neither did it have a formal IS strategy, preferring instead to adopt a reactive-follower strategy towards the acquisition and deployment of IS. Clearly, having both an IS strategy and an IS department would be advantageous were it feasible (DeCanio, Dibble and Amir-Atefi 2000).

Further, in the absence of SISP, it is hard to say what considerations have been guiding senior management in CUC1 (nor how consistent they have been) with respect to IS investment (Weill and Olson 1989; Earl 1993). Further, the lack of SISP suggested that IS was utilised more as a tool for operational efficiency as opposed to it being a strategic tool for the creation of opportunities for further growth and investment (Willcocks, Feeny and Islei 1997).

The second major difference between the original model and extended model in Figure 8.2 was the emergence of a set of intermediary variables, Operations, Customer service quality, Staff and Product delivery. Thus, the extended conceptual model for CUC1 showed that IS Investment (the IT portfolio) impacts organisational performance positively (but indirectly) by influencing improvements in the areas defined by the set of intermediary variables. These results were consistent with the findings of the meta-analysis discussed in Chapter 3, the results obtained from the

commercial/retail bank cases and were thus in keeping with much of the extant literature wherein direct causality between IS Investments has yet to be established. Of note was the fact that this set of variables has been derived specifically for FIs and will therefore help in developing a better understanding of the relationship between IS investment and organisational performance in the FSS.

Last, but not least, the research confirmed the role and impact of the Managerial effectiveness component. The research clearly showed that Managerial effectiveness does influence the IS investment and organisational performance relationship. In addition, the research succeeded in verifying the existence of the factors that make up this component and showed that their average perceived impact was high.

Clearly, this research successfully achieved its objectives in deriving a conceptual model that explains the IS investment and organisational performance relationship in CUC1.



## **8.3 Credit Union Case 2**

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### **8.3.1 Case Description**

Credit Union Case 2 is a large sized credit union with over 50 000 members and a widespread branch network within the metropolitan area of a state capital. CUC2 has a relatively flat, hierarchical organisational structure built along functional lines with the corporate head office providing administrative and back office functions and the PORs acting as the front office and providing contact with customers/members.

Like most credit unions in Australia, CUC2 is a member of the Credit Union Services Corporation Australia Limited (CUSCAL) and has outsourced its central processing to Co-processing Pty Ltd, a company that runs the Integrated Data Processing Centre (IDPC). Co-processing Pty Ltd was established in 1993 as a separate company owned by its founding members (credit unions) with the purpose of providing a cost effective centralised data processing environment (TSW 2003). Consequently, and by virtue of its membership, CUC2 enjoys both economies of scale and scope, and it is thus able to access and utilise powerful core computing services and systems that it would otherwise be unable to afford on its own.

CUC2 provides a wide range of services and products to its members including Automated Teller Machines (ATMs), Electronic Funds Transfer/Point Of Sale (EFT/POS), Internet Banking, Loans, Mortgages, Term Deposits, Savings accounts, Insurance, Credit cards, Financial planning, Share trading, Estate planning, Travel and many more. In the two year period of 2001 to 2002, CUC2 experienced a growth in profitability of over 60% and much of this was attributed to previous and ongoing investments in Information Technology. CUC2 prides itself on its ability to deliver a wide range of products and services both effectively and efficiently to its members through state of the art technology.

Given that CUC2 not only competes with other credit unions, including CUC1 and CUC3, but with much larger commercial/retail banks, its reliance on technology is therefore significant.

*Data Sources and Participants*

Four participants took part in the interview process as shown in Table 8.12.

Data Source(s)	Content/Summary
Participant 3 (P3) – Chief Executive Officer	Interview transcript
Participant 4 (P4) – Corporate Services Manager	Interview transcript
Participant 5 (P5) – Senior Manager Finance and Administration	Interview transcript
Participant (6) – IT Manager	Interview transcript
Contact Summary P3	Field notes from Participant 3 interview
Contact Summary P4	Field notes from Participant 4 interview
Contact Summary P5	Field notes from Participant 5 interview
Contact Summary P6	Field notes from Participant 6 interview
Financial Reports	1997 – 2001
IS budget Data (1997 – 2001)	Data regarding IS expenditure over a five year period
Newsletters	Information regarding CUC2 and its activities as reported for member benefit
Website	Variety of documents and information regarding CUC2's: <ul style="list-style-type: none"> <li>• Member services</li> <li>• News and information</li> <li>• Products and services</li> </ul>
Benefits Register	Sample project management documents
Organisational Effectiveness Survey	Annual report prepared by consultants and utilised primarily as an internal planning tool
Member Surveys	Annual report prepared by consultants and utilised primary for marketing purposes
Corporate Services business plan	Shared services operational plans
APRA Reports	Quarterly, prepared and submitted by CUC2 as per requirements of regulating authority

Table 8.12: CUC2 data sources and participants

Contact with CUC2 was initially established with the CEO who expressed interest in the project and invited the researcher to conduct the research in CUC2. As directed by the research design and case study protocol, a liaison was nominated and all contact with CUC2 was conducted through this liaison. It was during this initial meeting that potential participants were identified and nominated. Given the structure of CUC2, it was agreed that in addition to interviewing the IT manager, an interview with the Manager Corporate Services would also be conducted as well.

*Products and Services*

CUC2 offers a wide range of products and services to its members (Table 8.13).

Products	Savings
	Term Deposits
	Health cover (insurance)
	Loans and Mortgages
	Credit Card – Master Card
	Insurance – Motor vehicle and Home products
	Internet banking
	Automated Teller Machines
Services	Financial Planning
	Share trading
	Estate Planning, Executor Assistance Services and Online Will Services
	Legal Wills (Online)
	Car Search
	Reward program for members
	Conveyancing
	Bill paying facilities
Mobile financial advice	

Table 8.13: Some of the products and services offered by CUC2

CUC2 not only prides itself on providing competitive products through its technology, but also in delivering these products in a personalised and friendly manner in keeping with the credit union philosophy (Crapp and Skully 1985).

*Community Involvement*

CUC2 is involved in many community-based activities through a number of sponsorship programs. CUC2 publishes a newsletter through which it reports these activities and provides members and the community at large with useful advice across a broad spectrum of issues (CUC2 2002d). This aspect of CUC2's operations was in keeping with the credit union philosophy to which all credit unions in general subscribe (CUUPC 1988).

### **8.3.2 Case Analysis**

#### *Observations and Field Notes*

As mentioned earlier, four participants were nominated for and participated in this research. The following sub-sections present the observations and field notes taken during the interview session with each participant. As specified in the research design, these observations and field notes enabled the researcher to gain a better understanding of the participants' views and thus assisted in interpreting their responses.

#### **Participant 3 (P3) – Chief Executive Officer (CEO)**

P3 was the CEO of CUC2 and other controlled entities within the group. Due to P3's busy schedule, the interview had to be conducted in two parts, several days apart to minimise interference with P3's schedule. The main observations made of P3 during the interview now follow.

P3 was observed to be very knowledgeable and well educated, having recently completed a Masters degree. P3 had a marketing background and has had extensive experience in banking. Probably because of this background, it was evident during the discussion that P3 had a strong customer focus and in this regard discussed the need to establish a customer database (rudimentary customer relationship management system) that would enable CUC2 to better market itself and interact with its customers. During the interview, it became clear that P3 believed that recent IS investments by CUC2 were beginning to pay off with increases in profitability and reductions in operating costs being attributed thereof.

It was noted that P3 candidly admitted that, although P3 now firmly believed in the business value of IS, this had not always been the case. P3 attributed this change in perspective to efforts by P4 to educate senior management on the benefits of IS investments and whom P3 held to be a very active advocate of the business value of IS. Consequently, it was noted that P3 recurrently referred to the need to educate staff on the benefits of technology and to encourage them to familiarise themselves with available technology to better service customers (Andreu and Ciborra 1996).

Clearly, P3 was keen to use IS to achieve organisational goals through improved productivity and cost containment. Further, it was observed that P3 was acutely aware of the highly competitive nature of the FSS and believed that IS was a critical aspect to CUC2's ability to survive in this environment.

#### **Participant 4 (P4) – Manager Corporate Services**

As can be seen in Figure 8.3, the Corporate Services department encompassed all head office and back office functions, including the IT department. Thus, P4's primary function in this role was to provide operational support for all departments.

Like P3, P4 has had extensive experience in the FSS. During the interview, P4 displayed a broad understanding of operational issues relating to the organisation, in keeping with P4's role in CUC2. From the interview, the impression was formed that many of the ideas involving the (innovative) use of IS appear to have arisen from and were driven by the Corporate Services department.

Thus, and in keeping with the role of provider of support and operational services, P4 displayed a strong interest in utilising IS effectively and efficiently (DeCanio, Dibble and Amir-Atefi 2000). P4 therefore appeared to be constantly looking for ways to improve service and product delivery within the constraints of the organisation's capabilities.

#### **Participant 5 (P5)– Senior Manager Finance and Administration**

P5 reported to P4 as shown in Figure 8.3 with overall responsibility for all Finance and Administrative functions within the group. Like P3 and P4, P5 has had extensive experience in FSS in general and with CUC2 in particular.

It was observed that P5 had a high degree of focus on internal efficiency, including cost efficiency. In this regard, P5 displayed a keen appreciation of the impact of IS particularly on operational efficiency. Further, it was observed that P5 was dissatisfied with the core system, particularly the quality of management information

and the difficulty of extracting such information for decision support. Despite these obvious hindrances, P5 appreciated the fact that organisation could afford to replace the core system in the short term.

In addition, P5 showed a good understanding of the role of IS, particularly with respect to the competitive use of information (McFarlan 1984). Thus, P5 argued quite strongly that there was an ongoing need for continuous investment in IS so that the organisation did not maintain ageing equipment that would have to be replaced at some future date, and at significantly greater cost (Robson 1997). In this context, P5 argued that any apparent savings from not spending on IS on a continuous basis were short lived as operations would suffer and it could cost an organisation more in terms of the maintenance and/or upgrading of old/ageing equipment in the long term. Further, P5 also suggested that this would ultimately impact on quality of service delivered.

#### **Participant 6 (P6) – IT Manager**

As IT manager, P6 had a very small but efficient IT department with a total staff complement of three (3). This department provided support services for all of CUC2's front office and back office operations. To achieve this with the small staff complement, P6 was required not only to have a high level of 'hands-on' technical skill but also to have strong managerial skills. Thus, P6 and the IT staff implemented a number of automated and time saving utilities (such as remote application installation) which enabled them to support a fairly large desktop population with the small staff complement available.

It was observed that P6 had a strong focus on technology that was primarily directed internally with the aim of delivering a high level of service to CUC2 staff. Focus was largely on operational issues and this was understandable given that P6 was not part of the senior management team (Figure 8.3), although P6 was often required to provide input to that team (DeCanio, Dibble and Amir-Atefi 2000).

It was also observed that P6 felt that there was a lack of clarity as to the role of the IT department. One example given was that there appeared to be a view held by some

units in the organisation that the IT department appeared to be more loyal to (or gave preferential support to) the Corporate Services department at the expense of other departments. Another example was that the IT department was not always invited to, or involved in, meetings held by users during which IT related issues were discussed. Consequently, it was possible that some IT related issues may have remained unresolved for prolonged periods because they were not expeditiously brought to the attention of P6 and the IT department. This latter situation created the impression that the IT department was sometimes considered to be more of an 'outsider' and not necessarily involved in 'business' decisions.

Further, it was observed that many technology and support related solutions were in fact be driven by the Corporate Services department in general and the IT department in particular with few initiatives actually coming from the 'business'. It appeared that this was especially true of support issues whereby the IT department would take the initiative to experiment with new technologies (typically infrastructure) before a business case was put forward and before any new technology was deployed into the organisation.

### Structure

CUC2 was made up of a group of entities, the credit union operation and two strategic business units, Controlled Entity 1 and 2. Thus, CUC2 had a simple hierarchical structure as shown in Figure 8.3<sup>12</sup>.

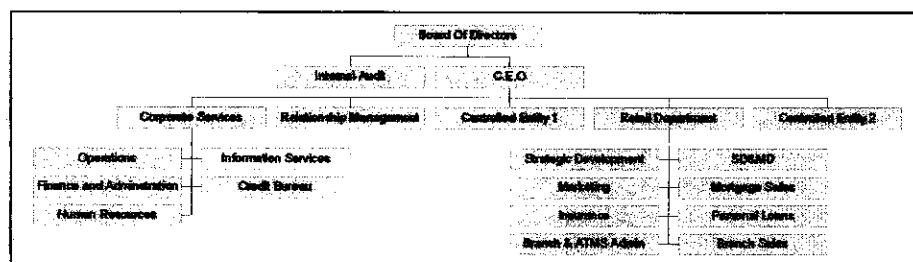


Figure 8.3: CUC2 structure

The group reported to a board of directors, nine in all, and had an eight-member senior management team led by the CEO.

<sup>12</sup> Names suppressed for confidentiality purposes

### **Dimensions of Organisational Structure**

CUC2 exhibited similar dimensions of organisational structure to those observed in CUC1, with the only difference being that CUC2 was much larger than CUC1. Thus, CUC2 exhibited a high degree of both horizontal and vertical differentiation resulting in a high level of functional specialisation as shown by the clearly defined functional structure of the organisation (Robbins 1987). CUC2 also displayed greater spatial differentiation compared to CUC1 as evidenced by its much larger number of PORs. In addition, CUC2 was a highly centralised organisation, which structure was perceived to be the most ideal for CUC2 given its size (Robbins 1987).

Thus, the credit union operation (in which the research was conducted) had a number of departments that were essentially split into two functional areas, front office functions (Relationship Management, Retail department, Controlled Entities 1 and 2) and back office functions (Corporate services and Head Office). Front Office functions are those functions that have direct contact with and provide an interface to members through which they interact with CUC2. This included over ten (10) PORs distributed across the metropolitan area of a state capital. In all, CUC2 had over 130 staff (Full Time Equivalents) with the majority (over 120) being employed directly in the credit union operation.

### *Size (as at 2001)*

CUC2 was a large sized credit union that continued to grow both organically and inorganically (through acquisitions/mergers and strategic alliances) with profits up over 60% in the 2001/2002 financial years (CUC2 2002a). According to P3, much of this increase in profitability has been attributed to investments in technology made over the past five years including investments at all levels of the IT portfolio including ATMs, front office systems, upgrades to the POR network.

From an asset perspective, CUC2 had a consolidated asset base of over \$400 million in 2002, up more than 9% from the previous financial year. Continued good performance and growth in the same period saw growth to over \$570 million in assets for the group. In terms its ability to meet the prudential requirements of the



regulatory authority, CUC2 exceeded the 8% minimum Capital adequacy requirement with a ratio of over 14%. In addition, CUC2 maintained a healthy liquidity ratio of approximately 13% well above the 9% minimum prudential standard. Lastly, CUC2 prided itself on its ability to deliver a wide range of products and services effectively and efficiently through its IS investments (CUC2 2002c).

### *Managing IS Activities*

As discussed earlier, CUC2 had a very small IT department consisting of an IT Manager and 2 support staff with the following responsibilities (CUC2 2002b):

- Infrastructure management (including telecommunications, LAN, Desktops etc)
- Management of relationship with Core System supplier
- Intranet development and management
- Technical project management and support
- Environmental scanning
- Business process improvement

Research revealed that CUC2 did not have a formalised/documentated IS strategy, although it but did have operational IT plans that were a subset of the Corporate Services department's business plans (CUC2 2002b).

### *Investment in IS*

The following sub-section discusses IS Investment in CUC2. Budget and financial data obtained from CUC2 are displayed and were used to determine the IS investment threshold in CUC2.

#### **IS Budget And Expenditure**

Table 8.14 summarises trends in key IS budget data obtained from CUC2.

Item	Budget/Expenditure Ratios (%)					
	2002	2001	2000	1999	1998	1997
Hardware	9	10	13	8	7	8
Software	36	39	31	30	34	30
Licensing/Rentals	41	42	40	46	54	58
Other Operating Expenditure	13	10	15	16	5	4
Total	100	100	100	100	100	100

Table 8.14: CUC2 IS budget ratios (percentage of overall expenditure)

Figure 8.4 graphically represents the data in Table 8.14.

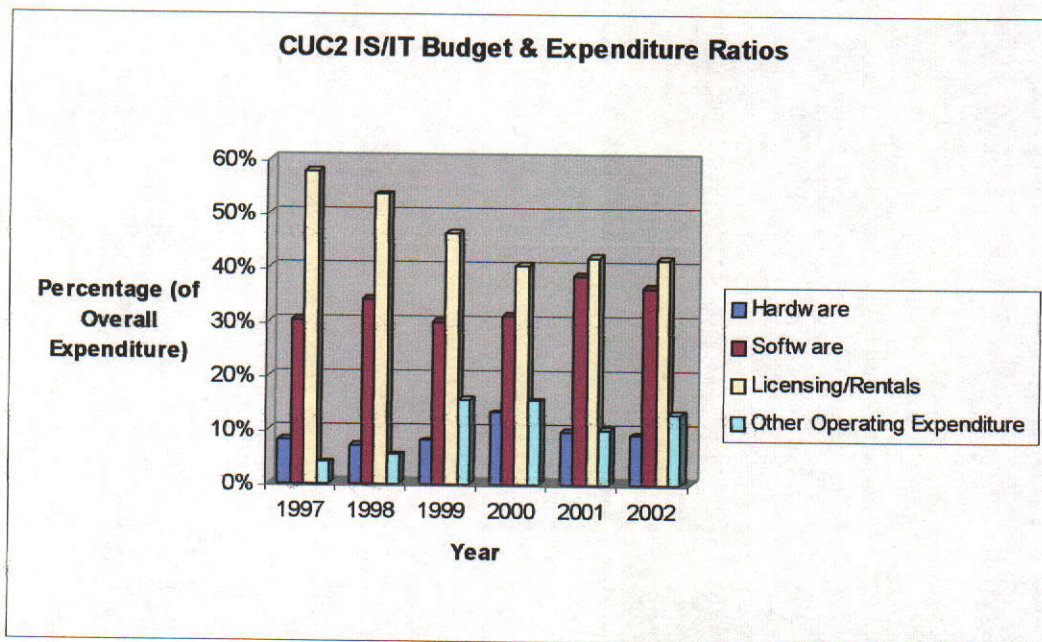


Figure 8.4: Graphical representation of CUC2 IS budget ratios (percentage of overall expenditure)

Licensing/rentals costs, which constitute the bulk of CUC2's IS expenditure, have decreased significantly over the past five years. This may be attributed to improvements in cost management, the streamlining of processes and operations and previous investments in IS that together have contributed to an overall decrease in Cost to Income ratio (currently around 80%).

It appears that hardware and other expenditure in general peaked around 1999/2000 in keeping with general trends due to Year 2000 (Y2K) issues and related projects

(Brown et al. 2000). This expenditure appears to be trending upwards again after reaching a low in 2001.

As P3 observed:

*“...our back office area has shrunk by about a tenth over the last five years while we have grown our business, probably doubled the size of our business... A lot of that is due to efficient IT processing and systems, not just all electronic but processing systems that are supported by IT and IS to keep those costs down. We have also generated revenues and a strong linkage through to our members through good use of technology.”*

From this it can be surmised that CUC2 is probably entering into an expansion or growth phase as a process of consolidation after successfully overcoming the uncertainties around the Year 2000 problem and associated issues. As an indication of this growth phase CUC2 recently merged with another credit society in a move that will no doubt strengthen CUC2's position in the marketplace (CUC2 2002a).

### Corporate IS Ratios

In addition to obtaining data relating to IS expenditure, other data were obtained from CUC2 to further determine IS expenditure with respect to key indicators as shown in Table 8.15.

These ratios were similar to those utilised in earlier studies, such as Cron and Sobol (1983), and enhanced overall understanding of IS expenditure relative to other expenditure in CUC2.

IS Ratios	2002	2001	2000	1999	1998	1997
IS expenditure as a percentage of overall expenditure	5%	4%	6%	5%	5%	5%
IS expenditure as a percentage of revenue	4%	4%	5%	5%	4%	4%
IS asset value as a percentage of revenue	32%	31%	38%	28%	24%	36%
IS asset value as a percentage of total assets	2%	1%	2%	1%	1%	3%

Table 8.15: IS management ratios in CUC2

Further, this data facilitated the establishment of an IS investment threshold and thus enabled comparisons with results from prior research (Bender 1986; Harris and Katz 1989). From this data (Table 8.15), it was observed that despite some increase in hardware, software and other operating expenditure, CUC2's IS expenditure appeared to be relative static, at approximately 5% ( $\pm 1\%$ ) of overall expenditure. This result was significant as it supported observations by Harris and Katz (1991) that higher IS costs do not necessarily lead to higher cost ratios and therefore provides credible arguments for increases in IS resource allocations where necessary.

### **IS Investment Threshold**

Questions relating to the existence and possible use of an IS Investment threshold elicited mixed responses from participants. Further, even though it was clear that the concept of an IS investment threshold was new to all of the participants, three of them (P3, P5 and P6) concurred and suggested that such a concept could be useful in managing IS investments, whereas one participant (P4) did not fully agree with the concept. As this concept was new to the participants, they were unable to quantify the level of the IS investment threshold for CUC2.

Thus, according to P3:

*"...the concept of a threshold amount that we need to spend to remain relevant I think is real for us."*

P5 concurred saying:

*"Yes, and if you have a look at some of our competitors particularly one down the road. They haven't spent significantly on IT for the last five years and as a result of that they are almost uncompetitive in a lot of areas, things like insurance... there's a lot of marketing things that they aren't competitive with. So, yes you need to keep up with technology to support the systems."*

As did P6:

*“I think there has to be, yes. Because I think part of the minimum spend is not only to remain competitive... I think once you make a commitment to put in the technology that we’ve put in, you have not choice but to maintain it... I don’t know if it makes you more competitive if you don’t spend it, but I think the danger of not spending it is, it’s a business tool that is not being maintained.”*

Whereas P4 differed, saying:

*“I don’t look at it like that. I look more at what do we need do to remain competitive and then by the way what is that going to cost us, if that makes sense... But its not like we set a threshold for IT expenditure and then we say, you know that’s it.”*

Clearly, the majority of participants viewed the IS investment threshold as a potentially useful tool that CUC2 could utilise in planning and managing IS investments. However, it was evident that CUC2 would only be able to utilise this concept if the IS investment level was more clearly defined (Bender 1986). Thus, in addition to the perceptions gathered using the interview questionnaire, secondary data were also collected and analysis of this data indicated that CUC2 has an IS investment threshold of approximately 5% (Table 8.15). These results were consistent with data reported in the literature (Bender 1986).

The following sub-sections discuss the extension of the conceptual model after application of data collected in CUC2, beginning with the IT portfolio, followed by Organisational performance, Considerations for SISP, Managerial effectiveness and Context.

### IT Portfolio

One important issue that the research sought to elaborate was the constitution of the IT portfolio and how this constitution affects and is subsequently affected by IS

investment decisions. CUC2 had a diverse IT portfolio that was quite complex<sup>13</sup>. In addition, CUC2 had a number of relationships with external third party service providers as it outsourced much of its IT. In terms of the conceptual model, all three components of the IT portfolio, Infrastructure, Transaction Processing System and a rudimentary MIS (primarily spreadsheet based) were observed to exist in CUC2.

### **Definition of IS and IT**

Observations in CUC2 led to the conclusion that the definition of IS and IT was still very much based on a technological perspective, on which there appeared to be strong consensus. This was consistent with the predominantly operational/utility view of IS observed in CUC2 (Willcocks and Lester 1999; Ward and Peppard 2002). According to P3, the definition of IS in CUC2 encompasses both hardware and software to support the business. P4 and P6 both defined IT mainly in terms of Infrastructure and Transaction Processing capability. P5 on the other hand defined IT in terms of technology's ability to deliver information to users.

Given this highly technological focus, the IT department's role was observed to be very much a technical support role that was internally focussed and primarily on infrastructure (Robson 1997). Thus, according to P6:

*“When I first came here, it was just computers which were IS. It then evolved into photocopiers were IS and IT, now its photocopiers, faxes, computers and more recently the society has purchased a new PABX, so IT now does telephones. We also do mobile phones. We've looked at changing the name of our group from Information Systems to Technology and Services, because I think what's happened now is that IT are being lumped with any technology that comes in not matter what. We appear to handle anything if it's electronic or electric, we seem to be left fixing it. I am not sure that's ideal, but that's how it is.”*

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<sup>13</sup> Specific details as to the composition of the IT portfolio were not discussed for confidentiality purposes.

In fact, discussions with P6 revealing that the IT department managed most if not all of CUC2's technical support issues, except for issues relating to the core TPS, which were outsourced. Further, the IT department had very little interaction with the TPS and did not use/require the TPS at all in performing their duties.

*"We as IT don't really use it, so its not something that {we support}... it's supported externally, we just keep the infrastructure going." (P6)*

Clearly, there was room for growth and the potential for a shift in focus from a purely utility view of IT to a more strategic focus and the attendant transformation of the IT department into an Information Systems department that could make an even greater contribution organisational performance (Avison, Cuthebertson and Powell 1999). This could be achieved by closer integration of the IT department within the organisation, redefining the role of the IT department and by raising the status of IS within the organisational structure (DeCanio, Dibble and Amir-Atefi 2000). It must be recognised however that such changes would have significant implications for CUC2 including, cost, human resources, capacity for change, and would therefore have to be carefully planned in order for them to be successful (Drago 1997). Thus, it was deduced that CUC2 needed to have a more explicit definition about what constitutes its IS and IT to better understand the most appropriate areas for IS Investment. In addition, CUC2 needs to consider the institution of a formalised SISP process and the adoption of a formal (documented) IS strategy (Pearlson and Saunders 2004). Thus, it was observed that, in the absence of a formalised IS strategy, many of the IT investment decisions appeared to be based largely on environmental scanning by P4 and P6 a tactic that was consistent with CUC2's strategy of being a quick follower (Porter 1980; Pearlson and Saunders 2004).

### **Rating of IT Portfolio Components**

To further understand the IT portfolio's constitution and where CUC2's IS investment was primarily focussed, respondents were asked to rate components of the IT portfolio in terms of their perceived importance to the organisation on a one (1) to five (5) scale (Table 8.16).

On average, there appeared to be strong consensus with regards to the importance of TPS to the organisation. The average ratings confirmed earlier discussions with interviewees in which they remarked that TPS were considered most important, as they were systems that generate income for CUC2.

Participant	Ratings of Importance		
	Infrastructure	Transaction Processing Systems	MIS
P3	3	3	4
P4	5	5	2
P5	3	5	4
P6	4	3	1
Average	3.75	4	2.75

Table 8.16: Participant ratings of relative importance of IT portfolio components

Further, the emphasis on infrastructure was also consistent with the role of the IT department in CUC2. As for the low average rating of MIS, two explanations were inferred. First, the low rating was due to the fact that MIS were not well developed in CUC2. At the time the research was conducted, MIS were spreadsheet based and all respondents acknowledged that was less than ideal. Second, the low rating suggested that participants might not fully realise the potential of MIS, although individually, P3 and P5 both rated it highly (hardly surprising given their roles in CUC2). This apparent lack of appreciation of the role of MIS may have been due in part to the aforementioned definitions of IS and IT as discussed earlier.

Thus, the diverse views of the relative importance of systems that comprise the IT portfolio, coupled with rather loose definitions of IS and IT by each of the participants seemed to point to an apparent lack of consensus on the role that each part of the IT portfolio plays within the organisation. Consequently, this may have led to a lack of appropriate attention being accorded to components of the IT portfolio when IS expenditure decisions were made (Mckeen and Smith 1993b; Seddon, Graeser and Willcocks 2002). This observation was further reinforced by comments from P6 that there was a certain element of 'scope creep' due to the lack of a more formalised definitions of what constitutes IS with the result that the IT department was having to take on everything that was 'technology'. Further, discussions with P4 identified the need to develop more formalised policies for the management of IS, but to do this, more formalised definitions of what constitutes IS in the organisation will be required (Korac-Kakabadse and Kakabadse 2001). The



foregoing issues could in effect be resolved through the adoption of a formalised SISP process and the development/implementation of a formal IS strategy (Ward and Peppard 2002).

Despite these apparent issues, there was a general agreement that IS Investments (as represented by the IT portfolio) were important and critical to CUC2. P4 highlighted this as follows:

*“There’s two things which we are, we are a retail organisation and we rely enormously on IT... if it doesn’t work we have people sitting there twiddling their thumbs.”*

Consequently, much of CUC2’s investments in IS have been directed at process improvement, cost reduction whilst increasing profitability. According to the CEO:

*“...there’s a lot on money to be saved on processes, our back office area has shrunk by about a tenth over the last five years while we have grown our business, probably doubled the size of our business but we’ve shrunk our back office”*

Whilst the above may be true, and CUC2 was continually seeking ways to cut or maintain costs, it is pertinent to note that CUC2, like many other credit unions, still had a relatively high cost to income ratio (around 80% for credit unions in general). Such a high cost to income ratio may have negative implications for CUC2 in the following key areas (Duncan and Elliot 2002):

- Customer service quality – may negatively impact CUC2’s ability to service customers cost effectively.
- Long term profitability – Being a mutual organisation, CUC2 is driven primarily by member service and not profit and shareholder return

From the P3’s comments, it can be noted that CUC2 certainly viewed its IS investments as part of its strategy for managing the foregoing issues. The members of the senior management team concurred with this view and agreed that IS investments to date have contributed positively to organisational performance, although as P4 put it:

*“I’ve got a view of organisations like this that, there is very little of what we do in this organisation where you can put your finger on something and say that is the thing that makes the difference. The question is does it make a difference and I’d argue very strongly, yes, but is it 10% or 20% or 50%, I would not know.”*

Clearly, the need to understand the business value of IS was an issue whose importance has been recognised by CUC2 as it strove to maximise existing investments whilst at the same time planning for future investments in IS.

### **Needs of Organisation**

In terms of the ability of existing systems to meet the organisation’s needs, it was observed that, although much of the CUC2’s infrastructure has been modernised, the core processing system was still considered the area that needs the most improvement primarily because of its age. According to P5:

*“So the core system, while it is a good banking system that does everything it is supposed to do in terms of a banking system, the sort of data it produces is a little bit antiquated for what we need, particularly for things like marketing.”*

In addition:

*“Its getting a little bit cumbersome, it can’t handle financial products that have become fashionable in the market.” (P5)*

Given the importance of TPS (rated higher in importance on average than the other components of the portfolio), it was surmised that there was a need to consider the future of these systems in the long run. Further discussion with P5 revealed that some alternatives had been considered (through and by CUSCAL) but caution was warranted due to the significant impact that any changes would have on member credit unions as whole.

### Impact of IS Investments

To determine how IS Investments actually contributed to organisational performance, participants were asked on which areas IS Investments were likely to have the most impact. Answers to this question led to the identification of a set of intermediary variables at which IS Investments appear to have been directed and whose improvement in turn led to increases in organisational performance. This finding was very significant for the development of the conceptual model. Table 8.17 shows the areas identified by participants.

Participant	Variables	Example
P4, P5	Operational efficiency	<ul style="list-style-type: none"> <li>• Automation of branch and other front office functions</li> <li>• Back office functions</li> <li>• Cash management</li> </ul>
P3	Customer Service	<ul style="list-style-type: none"> <li>• Customer Statements</li> <li>• Account queries</li> </ul>
P3	Product Delivery	<ul style="list-style-type: none"> <li>• Electronic Banking (ATM, Credit Cards etc)</li> <li>• Online banking</li> <li>• Telephone banking</li> </ul>
P5, P6	Staff	<ul style="list-style-type: none"> <li>• Training</li> <li>• Morale</li> <li>• Satisfaction</li> </ul>

Table 8.17: Emergent set of intermediary variables and their areas of impact in CUC2

Applying data collected to the original conceptual model led to the conclusion that CUC2 utilises its IS investments to enhance the areas identified in Table 8.17 and thus improve its performance.

Thus, not only did this research confirm the presence of the IT portfolio component of the conceptual model, it also demonstrated its suitability and practicality as a mechanism for identifying the level of IS investment in an organisation. Further, this research resulted in the identification of a set of intermediary variables. These results were significant as these variables appeared to play an important role in the IS investment and organisational performance relationship in CUC2.

Organisational Performance

Data were collected to verify the organisational performance component of the conceptual model for CUC2. In particular, data were collected to establish the types of Key Performance Indicators (KPIs) that constitute this component and their suitability/applicability to the conceptual model. Thus, a number of KPIs were identified that CUC2 utilised to measure and report performance both internally and externally.

**Key Performance Indicators**

Table 8.18 lists the KPIs identified in CUC2.

Internal	<ul style="list-style-type: none"><li>● Staff survey<ul style="list-style-type: none"><li>○ SERVQUAL</li></ul></li><li>● Customer survey</li><li>● Management reports (Cost Centre Reports)</li><li>● Technical<ul style="list-style-type: none"><li>○ Call centre statistics</li><li>○ Downtime reports</li><li>○ Problems logs</li></ul></li></ul>
External	<ul style="list-style-type: none"><li>● Cost to Income ratio</li><li>● Return On Equity</li><li>● Interest Income</li><li>● Non-Interest Income</li><li>● Interest margins</li></ul>

Table 8.18: Key Performance Indicators in CUC2

**Internal KPIs**

CUC2 regularly (annually) measured internal performance using the SERVQUAL instrument administered by a team of external consultants. The suitability of the SERVQUAL instrument in this regard has been demonstrated extensively in the literature (Pitt, Watson and Kavan 1995). According to P4, the results of these surveys have been used primarily in budgeting and planning activities. From a financial perspective, P5 indicated that management used cost centre reports as their

primary tool for monitoring costs and expenditure. From an IT perspective, CUC2 monitors statistics such as call centre statistics, downtime reports, problem logs etc however, these are not directly linked to IS Investment decision making nor do they determine the level of IS investment (although they may be taken into account when necessary).

Observations led to the conclusion that there did not appear to be a consistent approach to the use and incorporation of these internal KPIs with respect to IS investment decisions, despite the use of instruments such as SERVQUAL. This may be attributed in part to the lack of a formal SISP processes within CUC2 (Sohal and Ng 1998). However there did appear to be agreement amongst participants on the need for more structure around the IS planning activity and that the use of SERVQUAL could contribute to better IS management and therefore improved performance (Pitt, Watson and Kavan 1995; Pearlson and Saunders 2004).

### **External KPIs**

When asked which external KPIs were used by CUC2, responses were varied and suggested a lack of consistency (or knowledge) as to which were the most appropriate KPIs. P3 highlighted Return On Equity (ROE), Cost to Income ratio and profitability. Thus, P3 concluded by saying that CUC2 reports on most financial ratios. P4 pointed to ROE and Cost to Income ratio, whereas P6 singled out profitability. P5's response was more comprehensive, saying that CUC2 reported on all financial ratios and statistics as requested by APRA.

Despite this apparent lack of consistency, it was clear that CUC2 utilised financial ratios, such as those reported to APRA, as its external KPIs (APRA 2003). These indicators were cross-referenced against industry statistics, as reported to APRA, to confirm their validity and suitability as organisational performance indicators. In addition, P4 suggested that CUC2 also utilised these KPIs to benchmark its performance against its competitors. It was also evident that none of these external KPIs related directly to IS, although they could be indirectly impacted by IS investments.

Despite the presence and use of the aforementioned KPIs both internal and external, observations indicated that these KPIs may not always be considered during the IS investment decision making process. Further, P5 suggested that although cost might be a mitigating factor it was not a limiting factor in IS investment decision making and that it was really the perceived benefits that were the deciding factor when it came to IS Investments. In addition, despite the presence of a variety of performance indicators, there did not appear to be any mechanisms for monitoring IS investment relative to any of the identified KPIs, apart from ongoing operational expenditure that was monitored via budgeting control mechanisms. This appeared to support observations in the literature regarding the difficulty of relating the benefits of IS investments directly to financial measures of organisational performance (Bresnahan 1986) and suggested that sometimes IS investments may actually result more from qualitative assessments (and even 'gut feel' or 'hunches') than anything else.

Although CUC2 did have the capability to monitor costs via cost centres, its size did not make cost recovery mechanisms, such as Activity Based Costing, a viable tool for such purposes. This however does not preclude the need to build and implement mechanisms through which IS Investment may be monitored relative to organisational performance, particularly as all respondents agreed on the positive contribution of IS Investments to organisational performance (Robson 1997; Sircar, Turnbow and Bordoloi 2000).

Thus, this research confirmed the presence of the organisational performance component of the conceptual model. The model also confirmed that there were two aspects to the organisational performance component, an internal and external aspect. Consequently, this research was able to identify a number of KPIs that are utilised by CUC2 for measuring performance both internally and externally. Further, observations suggested that the actual KPIs utilised were determined to a greater or lesser extent by stakeholders (D'Souza and Williams 2000).

### *Considerations for Strategic Information Systems Planning*

CUC2 did not have any formalised process for SISP neither did it have a formal documented IS strategy. According to P4:

*“...we do actually have an IT strategy, we just don't have it written down. So we've actually started to put that together.”*

P3 did not fully concur with the foregoing, saying:

*“I think in reality we don't really have a strategic plan for our IT. We tend more to have a strategic plan for the business, ah and then obviously identify issues within that are relevant to the IT area.”*

Further enquiries revealed that CUC2 did indeed have a structured corporate planning process through which its corporate objectives and financial targets were set. As things stood management appeared to be happy with the rather informal nature of the planning process for IS. Though this approach appeared to have suited CUC2 in the past, it may be argued that, as CUC2 continues to grow, more structure and formalisation will have to be built around this approach including the introduction of formal SISP.

As alluded to earlier, it may well be that this lack of formal SISP has already had a negative effect particularly with respect to the manner in which management perceives the relative importance of components of CUC2's IT portfolio. This may have important ramifications for CUC2 going forward particularly when it comes to determining IS investment priorities (Grover, Teng and Fiedler 1998).

Table 8.19 shows the analysis of the nine factors that make up this component of the conceptual model for CUC2.

Factor	Status
Definition of IS	Not Present
Tracking of IS Investments	Not Present
Factors influencing investment decisions regarding IS	Not Present
Originators of IS initiatives	Not Present
Calculation of return on IS Investments	Not Present
Alignment of IS Investment with Corporate strategy/goals	Not Present
IS for competitive advantage	Not Present
Efficient/Effective utilisation of IS resources by organisation	Not Present
Development of policies for IS (Architectures, technologies etc)	Not Present

Table 8.19: Status of considerations for SISP in CUC2

Thus, not having a formal SISP process potentially affects CUC2's ability to plan for, and thus determine, appropriate levels of IS investments.

Managerial Effectiveness

Five factors have been identified in the literature as comprising the Managerial effectiveness component of the conceptual model (Weill 1992; Markus and Soh 1993). Table 8.20 show the status of these factors in CUC2.

Factor	Impact (Low, Med or High)
Senior management commitment to IS	High
Firm experience with IS	Medium
User satisfaction with IS	Medium
The organisation's internal political environment	Low
The organisational structure	High

Table 8.20: Impact of Managerial effectiveness variables on IS investment and Organisational performance relationship in CUC2

CUC2's senior management appeared to exhibit a high level of commitment to IS. Discussions with P6 provided the following comments with respect to senior management commitment:

*"Definitely absolutely, 100%."*

And:

*"I think with all senior management, with all management... seeing the benefits of IT, it has to have a positive effect...I think most managers realise that IT is critical to them doing their jobs."*

In fact, P3 candidly admitted to not having a strong IS background and not having been particularly in favour of the use of IS in the past. However, P3 credited his change in perspective to P4, whom P3 said has helped him to learn more about and appreciate the benefits of utilising IS:

*"And I will be honest to say that as the CEO, I would not have had such a strong contribution from IS if it wasn't for P4 and his ability to convince me to adopt this path"*

By taking up the challenge to educate the P3 on the benefits of IS, P4 succeeded in bridging the gap between senior management and the IS function, thus aligning their



possibly divergent perspectives and in the process has facilitated the creation of an environment in which IS use is encouraged through greater senior management commitment (Peppard 2001).

This willingness to learn about the benefits of IS, particularly at such a senior level, seemed to be a strong cultural issue that senior management appeared to be cultivating within staff on the back of the realisation that most, if not all, of the work performed was via computers (Weber and Pliskin 1996). Management therefore plays an important role in determining and encouraging the effective utilisation of IS resources in any organisation (Peppard and Ward 1999). As P5 observed:

*“Purely on the basis that if managers and senior managers are using the technology effectively, then everyone will use it as well. There’s are a lot of things that must necessarily come from the top.”*

Thus, staff in CUC2 were actively encouraged to use technology and to learn about the various products and services so that they may better serve members (Weber and Pliskin 1996).

One cultural issue that has been identified in the literature as having a possible negative effect was the factor relating to the political environment (Wood et al. 2004). CUC2 however did not exhibit any such negative effects. This may be related to, and mediated by, two issues, 1) the organisational structure and 2) the apparent cohesiveness of the management team. In CUC2’s case, both these issues may be a direct result of the size of the organisation and management’s role (Mintzberg and Quinn 1996).

The foregoing therefore led to the conclusion that the impact of the Managerial effectiveness component on the determination of the level of investment (and eventual utilisation) of IS cannot be understated. As suggested in the literature the more effective the management process, the better the utilisation of IS within an organisation (Harris and Katz 1989; Sohal and Ng 1998). Observations in CUC2 indicated that the Managerial effectiveness component had an overall medium level impact. This was consistent with earlier observations regarding the role of IS in CUC2 and although encouraging suggests that more could be done by CUC2 to maximise its IS investments.

Thus, for CUC2, this research confirmed the presence of the Managerial effectiveness component of the conceptual model. The results also confirmed that all of the five factors that constitute Managerial effectiveness do have an impact on the IS investment and organisational performance relationship by influencing the nature, type and level of IS investment.

### Context

One of the major weaknesses identified in earlier research has been the lack of a deliberate attempt to consider organisational context when designing research projects on the IS investment and organisational performance relationship (Kauffman and Weill 1989). Recently however, there has been a growing call for researchers to consider the issue of context in all aspects of IS research (Trauth 2001). This need for the elaboration of the impact of context has, in part, led to the increased use of interpretive approaches in IS research.

Thus organisational context is important and it is vital that IS professionals and academics develop an appreciation of this issue if IS investment decisions are to be relevant and contribute to organisational performance (Avgerou 2001). The issue of context assumes a higher level of significance for the FSS, as it is a regulated industry (Harker and Zenios 2000b).

Two significant contextual issues were observed to influence CUC2's IS investment decisions. The first was related to the type of IS investments made by an FI. This led to the conclusion that there are two main types of IS investment made by CUC2, discretionary and mandatory IS investments arising from competition and regulation respectively (Llewellyn 1996; Brown et al. 2002). Thus, in the context of the FSS, discretionary investments are those IS investments driven from within the organisation by the need to compete effectively and may be targeted at any level of the IT portfolio to achieve or deliver a given set of benefits to the organisation. Conversely, mandatory IS investments are those IS investments driven by the need to attain regulatory compliance as set by the industry's regulatory authority from time to time.

The second was that it is possible for organisations to make investments into IS that may have such an impact on the environment as to change the way the organisation competes<sup>14</sup>. This observation was significant as it lends support to similar observations in the literature regarding IS and competition (Mcfarlan 1984; Porter and Millar 1985; Pearlson and Saunders 2004). From that perspective, organisations may investment in IS in order to gain competitive advantage, however, the corollary to that is that IS alone will not give an organisation long term sustainable competitive advantage as it can easily be duplicated (Willcocks, Feeny and Islei 1997). Thus, IS investments need to be made in the context of a broader strategy in order to achieve sustainable competitive advantage (Ward and Peppard 2002).

### **8.3.3 Extended Conceptual Model for CUC2**

The foregoing analysis clearly shows that the resultant extended conceptual model for CUC2 was identical to that derived for CUC1 as illustrated in Figure 8.2, with the following characteristics:

1. The extended conceptual model derived for CUC2 exhibits three out of four of the original components of the conceptual model:
  - a. The level of IS investment (IT portfolio)
  - b. Organisational performance
  - c. Managerial effectiveness.
2. The extended conceptual model derived for CUC2 does not have the secondary relationship between organisational performance and IS investment as identified by the considerations for SISP.
3. The emergence of a set of intermediary variables, Staff, Product delivery, Operational efficiency and Customer service quality, leading to the conclusion that the relationship between IS investment and organisational performance is positive but indirect and moderated by this set of variables.

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<sup>14</sup> Specific examples cannot be provided here, as that would identify the organisation in question.

Discussions with participants revealed that IS investments in CUC2 over the past five years have been motivated primarily by the need to improve organisational performance and that CUC2 was in effect beginning to realise the benefits of its previous investments in the form of increased productivity and profitability (Mckeen and Smith 1993b). CUC2 has focussed its IS investment primarily on the TPS and on improving its infrastructure, whereas investment in MIS have lagged. According to the participants, CUC2's expenditures in TPS and infrastructure have been directed primarily at bringing about changes in four key areas, identified by the aforementioned a set of intermediary variables, and they in turn have made a significant contribution to organisational performance.

It was noted, that CUC2 did not have a formalised SISP, neither did it have a formal documented IS strategy. It may therefore be argued that the magnitude of the benefits achieved from IS investments over the past five years could in effect have been understated because of the lack of a SISP process that would complete the IS investment cycle and hence provide the necessary feedback required to evaluate organisational performance against IS investments (Robson 1997). It can further be argued that having this part of the cycle in place would have enabled CUC2 to develop a clearer picture of the impact of its IS investments thus resulting in further improvements to the IS investment decision-making process (Willcocks and Lester 1999).

Therefore, having a formalised SISP as part of the IS investment cycle would have enabled the CUC2 to have a mechanism of reviewing organisational performance in terms of IS investments thus taking into account the effect of time lags on the IS investment and organisational performance relationship (Weill and Olson 1989). Despite the apparent absence of a formal SISP, it was evident that CUC2 did have an (operational) IT plan although it was not formalised. In addition, CUC2 did have a semi-formal benefits realisation process that has enabled it to maximise individual investments, thus mitigating the lack of a formal SISP (Jurison 1996). However, it is argued that incorporating these activities into a formal SISP process as illustrated by the conceptual model would in all probability result in higher performance levels than those currently being achieved.

As alluded to earlier, observations in CUC2 indicated that its IS investments were perceived to impact most on the aforementioned set of intermediary variables (discussed further in Chapter 10). Closer inspection of these variables also suggested that they may not stand in isolation and that they may in fact interact with each other as well, however further research is required in this regard (Chapter 10). Thus, the extended conceptual model for CUC2 shows that IS investment (the IT portfolio) impacts upon organisational performance by influencing improvements in the areas defined by the set of intermediary variables. This impact is perceived to be positive and hence contributed to improved organisational performance in CUC2 (Robson 1997; Willcocks and Lester 1999; Pearlson and Saunders 2004).

It is noteworthy that this set of variables has been derived specifically for FIs and will therefore assist in developing a better understanding of the relationship between IS investment and organisational performance in the FSS. Furthermore, the emergence of the set of intermediary variables in the conceptual model led to the conclusion that this relationship was positive but indirect and was moderated by this set of variables. These results were consistent with the findings of the meta-analysis as discussed in Chapter 3 and were in keeping with much of the extant literature wherein direct causality between IS Investments has yet to be established.

Turning to the Managerial effectiveness component of the conceptual model, it was evident that this component has a significant impact on the relationship between IS investment and organisational performance in CUC2 (Markus and Soh 1993). Thus, for CUC2, this research confirmed the presence of the Managerial effectiveness component of the conceptual model and confirmed that all of the five factors that constitute Managerial effectiveness were present in CUC2 and did have an impact on the IS investment and organisational performance relationship. It was therefore concluded that the Managerial effectiveness component affected this relationship by influencing the nature, type and level of IS investments (Weill 1992).

Thus, results obtained from CUC2 provided strong support for the components of the conceptual model and the resultant extended conceptual model clearly describes the relationship between IS investment and organisational performance in CUC2.

## **8.4 Credit Union Case 3**

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### **8.4.1 Case Description**

Credit Union Case 3 is a medium sized credit union that operates in one of the states in Australia. In addition to the credit union that forms the main line of business, CUC3, like CUC1 and CUC2, also operates a travel service that is available to its members and the public. Within its home state, CUC3 has a small but widespread network of PORs located within the state capital and regional areas. CUC3 has a relatively flat hierarchical structure that reflects its size (CUC3 2003b).

Like other credit unions, CUC3 prides itself on high levels of customer service quality, a singular characteristic of credit unions in general, that CUC3 utilises to attract customers who are dissatisfied with larger FIs (CUC3 2003a). Thus, CUC3 is proud of its POR network and branch distribution that it believes makes its services highly accessible to existing and potential members (CUC3 2003a). In addition and because of its size, CUC3 claims that members are able to access branch managers directly and hence emphasises the fact that it can provide close personal service to all of its members (Reynolds and Ochalla 2003; CUC3 2003a).

CUC3 presented a unique case study in that, unlike other cases in the sample, CUC3 was an organisation in transition with very recent appointments of new personnel to key senior executive roles, including the Chief Executive Officer, the Chief Financial Officer and the Chief Information Officer, all of whom participated in the study. The new management team brought with it a fresh perspective and a breadth of local and international experience and in the short time that they had been with CUC3 introduced many changes that were designed to (and were already beginning) benefit the FI.

It was observed that with these changes came a number of organisational behavioural issues (Wood et al. 2004) that the senior management team has had to address as part of the change process (Wilson 1993). The most prominent organisational behaviour issues observed were in the change in management style from being highly bureaucratic and autocratic regime to a more cooperative and less autocratic regime (Mintzberg and Quinn 1996). In addition, management has had to manage the legacy

of the high level of internal politics that accompanied the previous management style. However, there was a belief in the three participants that this issue could be utilised positively by the organisation within CUC3's group processes and interactions (Wood et al. 2004).

It was particularly noteworthy that many of the changes were driven by the introduction of an IS strategy aimed at key areas of the organisation with the express objective of improving organisational performance and promoting long-term growth (Avgerou 2001). The focus on IS investment was particularly poignant in that observations indicated a high level of concurrence between the participants on the lack of IS investment in the past. Thus, the new management team inherited an organisation that had been run on very stringent financial controls with a high cost focus to the detriment of investment in areas such as IS.

#### *Data Sources and Participants*

Table 8.21 lists the data sources and participants in CUC3.

Data Source(s)	Summary
Participant 13 (P13) – Executive Manager, Information Systems	Interview transcript
Participant 14 (P14) – Chief Executive Officer	Interview transcript
Participant 15 (P15) – Chief Financial Officer	Interview transcript
Contact Summary P13	Field notes from Participant 13 interview
Contact Summary P14	Field notes from Participant 14 interview
Contact Summary P15	Field notes from Participant 15 interview
Annual Reports and Financial Statements	1997 – 2003
Newsletters	Information regarding the CUC3 and its activities as reported for member benefit
CUC3 Website	Variety of documents and information regarding CUC3's; <ul style="list-style-type: none"> <li>• Member services</li> <li>• News and information</li> <li>• Products</li> <li>• Member Information</li> </ul>

Table 8.21: Data sources and participants from CUC3 case

Three participants took part in the research, the Executive Manager, Information Systems, EMIS (P13), the Chief Executive Officer, CEO (P14), and the Chief Financial Officer, CFO (P15).

Interview data in the form of transcripts constituted the primary data source. In addition, a significant amount of secondary data was compiled in the form of field notes, observations, annual reports, financial statements and newsletters. In addition to the foregoing, even more information was obtained from CUC3's website.

Initial contact was established with the EMIS and a preliminary meeting was arranged during which the research program was outlined. The case study protocol was also discussed and explained in detail. In addition, potential participants were identified and nominated. As specified in the research design, one person was nominated as the liaison between CUC3 and the researcher. In this case it was the EMIS who was nominated to act as liaison between the researcher and CUC3. Once participants were nominated, a schedule was drawn up and interviews conducted as per the case study protocol.

*Products and Services*

CUC3 provides a wide range of products and services as shown in Table 8.22.

Products	Investments (e.g. Money market, Financial planning, Term deposits, Cash management etc)
	Savings and Transaction Accounts
	Loans (Home, personal and car)
	Insurance
	Credit Cards
Services	Travel Services
	Car buying service
	Internet/Online banking
	Telephone banking
	Bill paying services
	ATMs
	Foreign exchange services
	Cheques
Settlements	

Table 8.22: CUC3 products and services



Members are able to access products and services via a number of channels including, physically through the POR network, online via CUC3's website or via the telephone (CUC3 2003a).

### *Community Involvement*

Since its inception, CUC3 has been active in its community and prides itself not only on providing affordable financial services to its members, but also on its involvement in a number of community-based activities and initiatives. This involvement with its community is keeping with the credit union philosophy of "people helping people" (CUUPC 1988, p4). CUC3 therefore supports its members and the public in general with financial assistance in the form of sponsorship in a variety of areas including education, health, sports, arts and the environment (CUC3 2003b).

## **8.4.2 Case Analysis**

This section presents the case analysis for CUC3 based on the results from the case study. The case analysis begins by presenting observations and field notes from the interviews with the participants. This is followed by a discussion of the structure of CUC3 and the management of IS in CUC3. This information is important in that it presents a milieu against which the IS investment and organisational performance relationship in CUC3 may be better understood.

Immediately thereafter, the analysis proceeds to elucidate the individual components of the conceptual model, resulting in the derivation of an extended conceptual model for CUC3.

### *Observations and Field Notes*

As described earlier, three participants were nominated for and participated in this research, the CEO, the CFO and the EMIS. The following sub-sections present the observations and field notes taken during the interview sessions with these

participants. As specified in the research design, these observations and field notes enabled the researcher to gain a better understanding of the participants' views and thus assisted in interpreting their responses.

### **Participant 13 (P13) – Executive Manager Information Systems**

P13 had only recently been appointed to this role. Observations and discussions with P13 revealed that P13 has had extensive experience in Information Systems and project management. Prior to joining CUC3, P13 had worked in the Insurance industry and this experience may be argued to have enabled P13 to bring a new and different perspective to CUC3.

P13 was primarily appointed to the role of EMIS in order to introduce an IS strategy into CUC3. However, P13 recognised that simply formulating an IS strategy for CUC3 would not be sufficient to address some of the inherent problems in the organisation and in so doing identified two key areas that would need to be addressed as part of the change process. These were: 1) the IT portfolio (infrastructure, TPS and MIS) and 2) the implementation of a governance model for managing IS (Korac-Kakabadse and Kakabadse 2001). To manage the implementation of these changes, P13 had adopted a modified version of the PRINCE methodology. The only causes for concern observed in this regard was the fact that the IS strategy was formulated in parallel to the corporate strategy (with possible implications to the alignment with corporate strategy) and the fact it was primarily driven by the IS function. However, discussions with P13 indicated that these issues had been recognised as situational issues that had arisen out of the CUC3 circumstances and that these issues were being addressed (Henderson and Venkatraman 1993).

### **Participant 14 (P14) – Chief Executive Officer**

P14 was observed to be very experienced in the FSS. P14's key objectives for the short term were to focus on organisational change aimed at improving performance and promoting long-term growth (Wilson 1993). P14 appeared to be knowledgeable

with respect to role of IS in the organisation and very keen to utilise IS to bring about change in CUC3.

During the interview, P14 appeared to be very astute and recognised that some of the issues besetting CUC3 were a result of organisational behavioural issues inherited from the previously autocratic and bureaucratic management culture (Stacey 1993; Wood et al. 2004). Consequently, P14 championed a number of changes in the organisation aimed at mitigating the negative effects of these issues. It was therefore anticipated that the probability of success of the changes being introduced into CUC3 was high, as they were supported by a motivated senior management team which was led by a very committed CEO (Mckeen and Smith 1996).

#### **Participant 15 (P15) – Chief Financial Officer**

As with the other participants, observations indicated that P15 was a very experienced individual with both local and international banking experience. This unique experience enables P15 to play key roles not only in the day-to-day management but also in the transformation of CUC3.

P15 appeared to be highly focussed on the internal on the operations of CUC3, however this was not surprising given P15's role as CFO. This was strikingly similar to observations regarding other CFOs in the other FIs in the sample. Further, like the other participants in CUC3, P15 also recognised the important role that IS can play in a FI. Furthermore, as the CFO, P15 was perhaps the person most affected by the poor quality of systems such as the previous General ledger (GL) System and the lack of a good quality MIS, although it should pointed that a new GL had recently been installed. Consequently, P15 was strongly in favour of the changes that were being implemented in CUC3 and the use of IS to engender improvements in all areas of the organisation. P15 therefore anticipated that these changes would enhance the Finance department's ability to provide management information to other units.

### Structure

Figure 8.5 illustrates CUC3's organisational structure. Like the other FIs in the sample, CUC3 had a hierarchical structure that was designed along functional lines and led by a Chief Executive Officer. Altogether, CUC3 consisted of nine functional areas each led by a senior manager.

The IS function was led by a senior manager, the Executive Manager Information Systems, and reported directly to the CEO as shown in Figure 8.5. This relationship highlights the importance attached to the IS function by CUC3 and its key role in driving change in the organisation through IS investment (Avison, Cuthebertson and Powell 1999).

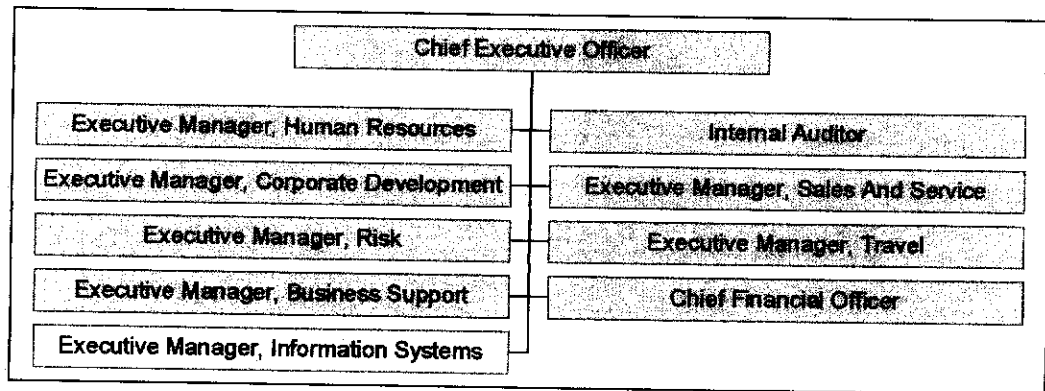


Figure 8.5: CUC3 organisational structure

According to P13, the structure shown in Figure 8.5 was designed to support a business model represented by a pyramid with sales and service (front office) functions at its apex, the operations function (back office) in the middle of the pyramid and shared services such as IS, Finance and Human Resources forming the base of the pyramid. This business model was recently adopted to re-focus CUC3's activities and ensure that appropriate emphasis was placed in the right areas of CUC3 (DeCanio, Dibble and Amir-Atefi 2000). P13 described the need to implement this business model as follows:

*"The way the organisation was structured in the past was really hierarchical, top-down thing where the CEO ran a very tight ship and the Finance guy looked after IT, so everything was top down. But really what this is about is trying to provide recognition that the people who are*

*actually facing the members are the most important people in the business. They {back office} are the next most important, because they have some member contact and if they screw up it makes it very hard for these people to appropriately service members. And again down here, it's a huge shift with Finance, HR and IT, they don't run the company – which is the old model – your job is to support them (back office), who support them (front office) who support the customer. I think that's an appropriate business model.”*

It should be noted that this business model was in fact similar to those adopted by the other credit unions in the sample as described in Sections 8.2 and 8.3. Further, it was also noted that the introduction of this new business model heralded a change in the culture of the organisation from one that was predominantly autocratic to one that is more cooperative and group oriented (Mintzberg and Quinn 1996). This may be argued to have had a positive influence on the change process, thereby increasing the probability of success. Last but not least was the very apparent and important recognition of the role that IS could play in this business model to also enhance the probability of success in the transition process that CUC3 was undergoing (Szewczak, Snodgrass and Khosrowpour 1991).

### **Dimensions of Organisational Structure**

Like the preceding cases, CUC3 also displayed similar dimensions of organisational structure. This was not surprising given the striking similarities observed in credit unions in general (Crapp and Skully 1985). These similarities were also evident in the nature and type of products and services offered by the credit unions in the sample.

Thus, CUC3 also exhibited both horizontal and vertical differentiation observable in the functional specialisations clearly depicted in the organisational structure (Robbins 1987). Despite CUC3's smaller size in terms of its asset base, compared to CUC2, CUC3 exhibited greater spatial differentiation with PORs in both metropolitan and regional areas.

### Size

In the 2002/2003 financial year, CUC3 had an asset base of over \$400 million, corresponding to a 25% increase in total assets under management, although, profit growth was relatively static (CUC3 2003a). According to P13, CUC3 registered good growth and much of this was attributable to recent changes in the senior management team and a refocusing of the corporate strategy. These changes have resulted in enhancements to all areas of the organisation, particularly risk management and IS.

In addition to achieving growth in a number of key areas such as lending and deposits, CUC3 also registered an increase in its member base whilst simultaneously registering a decrease in staff turnover (CUC3 2003a).

### Managing IS Activities

In the past, IS was viewed more as a utility as opposed to being viewed as an integral part of the organisation. Thus, in the old structure, the IS function was part of the Finance department and reported to the Finance officer. Avison, Cuthebertson and Powell (1999) provide a thorough discussion on the implications of such structures for the management of IS activities. The new management team recognised this problem and set about addressing it by making significant changes to both structure and process within CUC3. Part of these changes entailed the implementation of the new structure and business model discussed earlier. According to P13:

*“Certainly what I’m trying to do is to move to a model where IS is seen as an integral part of the business, not only the delivery of information technology but about the application of tools, for example project management is an area that has not been used in CUC3.”*

At the time of this research, the IS department was a relatively small department consisting of an Executive IS Manager (P13) and 4 support staff whose responsibilities included:

- IS Strategy planning and implementation

- Infrastructure management (including telecommunications, LAN, Desktops etc)
- Management of the relationship with the Core System supplier
- Technical project management and support
- Environmental scanning
- Business process improvement

CUC3 recently completed a SISP process that resulted in the compilation of a formal IS strategy document. The institution of a SISP process marked a significant shift in focus with respect to the management of IS in CUC3 and signified an important milestone in CUC3's growth and development. The foregoing have also heralded significant changes in the culture of CUC3, in that senior management now recognise the importance and criticality of IS investment to the performance of their organisation (Harker and Zenios 2000a).

The introduction of a new structure and IS strategy also introduced changes to organisational processes (Pearlson and Saunders 2004). Most notable have been changes to the way in which IS budgets are managed, with the IS function now having greater responsibility over IS budgets. However, there did appear to be some divergence of views in this regard with P15 suggesting that the IS function should have responsibility for budget planning and the responsibility for execution/implementation should rest with the business units. P13 tended to disagree and pointed out that such an approach could create accountability issues with respect to IS expenditure and management. Clearly, there were still a number of implementation issues that needed to be resolved if CUC3 was to gain the maximum benefit from the changes being implemented. Further, the foregoing suggests that there would need to be a good deal of learning, both individual and organisational, as part of the resolution process (Wood et al. 2004). In addition, it was evident that there would be a need for extensive change management to enhance the resolution process (Wilson 1993).

Furthermore, it was evident that with the change in the status of the IS department in the organisation, the motivation for IS investment would more clearly reflect the IS

department's key role and contribution to organisational performance going forward (Avison, Cuthebertson and Powell 1999).

### **IS Investment Threshold**

Given the increased prominence of IS in CUC3, it was not surprising to observe that all participants in this case acknowledged the existence of an IS investment threshold. All three participants agreed with this concept, but only P15 was able to quantify the level of the IS investment threshold in CUC3. According to p15:

*"I am reaching for my budget to see what we've actually got there. I mean I tend to work around the ten percent of our cost base."*

After further prompting, P13 also concurred that this threshold could range between the 10% to 15% level. These observations were in line with evidence in the literature as discussed in Chapter 2.

It was encouraging to note that professionals in industry (such as the participants in CUC3) believe in the existence and practicality of this concept and accept the utility of such a concept in IS investment planning. Such results enhance the validity of this research and the conceptual model.

### **IT Portfolio**

This section discusses the IT portfolio component of the conceptual model. To begin with, the analysis considers how CUC3 defined Information Systems and Information Technology and what the implications of these definitions may have for the composition of the IT portfolio, the perceived importance of the parts of the IT portfolio, how the needs of the organisation are satisfied and the perceived impact of the IT portfolio.



### Definition of IS

There was a high level of congruence in the views of the participants regarding the definition of IS in CUC3. Upon further consideration, it was concluded that this was hardly surprising as CUC3 had recently undergone an IS strategy planning process in which these issues would have been addressed in detail (Ward and Peppard 2002).

In all instances, participants made the clear distinction between IS and IT and recognised that IT was a subset of IS as defined in Chapter 2. For example, according to P14:

*“To me, the Information Systems and we particularly call the area Information Systems as opposed to Information Technology, so its IS rather IT to signify that its not just the hardware, its about a coherent provision of information services....So I suppose it is a prerequisite to being able to do business.”*

Clearly, this was significant in that a higher degree of congruence on the definition of what constitutes IS investments will contribute to a more effective SISP process (Weill and Olson 1989; Kauffman and Weill 1989).

### Rating of IT Portfolio Components

When it came to rating the individual components of the IT portfolio to highlight which aspects of the portfolio contributed the most to organisational performance and hence determine where CUC3 was more likely to make focus its IS expenditure, the responses were strikingly similar yet again (Table 8.23).

Participant	Ratings of Importance		
	Infrastructure	Transaction Processing Systems	MIS
P13	All important	All important	All important
P14	3.5	4	2.5
P15	Ranked 2 <sup>nd</sup>	Ranked 1 <sup>st</sup>	Ranked 3 <sup>rd</sup>

Table 8.23: Individual responses regarding the importance and contribution of IT portfolio components to organisational performance.

Although the participants were requested to rate the individual components of the IT portfolio, one of the participants (P15) preferred to rank the components instead. Be that as it may, responses received were of sufficient clarity and clearly depicted the contribution of the IT portfolio to performance. It is worth noting at this juncture that this flexibility in the collection and interpretation of data is one of the key strengths of utilising a pluralist approach to research (Mingers 2001).

In all instances, participants highlighted that fact that TPS were perceived to contribute the most to organisational performance. According to P13:

*“...my view is that transaction processing is core to the business, without it the business would not be able to survive...I'd say that no sensible FIs, regardless of their size, could seriously intend to operate in this market without strong investment in all three areas.”*

P15 concurred:

*“...in many regards the capability to do transaction processing is prime, because that is what we are in business to do. Our customers use us to perform their transactions, so that has to be our prime focus.”*

As did P14 who said:

*“...what contributes most to the business right now, currently it is the Transactional part”*

Conversely, all participants also agreed on the fact that the MIS component of the IT portfolio was weakest. Participants further concurred that MIS would be important in the medium to long term and hence there was a need to focus future IS investments into improving this component.

Thus, P13 identified weaknesses in the IT portfolio as being an ageing infrastructure and TPS, a weak and rudimentary MIS that was spreadsheet based that altogether comprised an IT portfolio that was not well integrated. Further, specific reference was made to the General Ledger system, although P15 did specify that a new General Ledger system was currently being implemented to address some of the shortcomings in the IT portfolio. It was noted that these weaknesses had existed in

the organisation for some time due to the lack of planned IS investment alluded to earlier.

Thus, it was anticipated that the newly formulated IS strategy would address these weakness and result in a more robust IT portfolio that would contribute to improved performance by more efficiently and effectively meeting the needs of the organisation.

### Impact of IT Portfolio

Table 8.24 summarises the areas upon which IS investment is perceived to directly impact.

Participant	Variable	Example
P13, P14, P15	Operational efficiency	<ul style="list-style-type: none"> <li>• Automation of branch and other front office functions</li> <li>• Back office functions</li> </ul>
P13, P15	Customer service quality	<ul style="list-style-type: none"> <li>• Efficient processing of customer transactions</li> <li>• Account queries</li> </ul>
P13, P14, P15	Product Delivery	<ul style="list-style-type: none"> <li>• Traditional face to face banking</li> <li>• Electronic Banking (ATM, Credit Cards etc)</li> <li>• Online banking</li> <li>• Telephone banking</li> </ul>
P13, P14	Staff	<ul style="list-style-type: none"> <li>• Training</li> <li>• Morale</li> <li>• Satisfaction</li> </ul>

Table 8.24: Emergent set of intermediary variables and their areas of impact in CUC3

It is argued here that IS investments in the form of the IT portfolio impact upon this emergent set of variables directly and consequently result in improvements in organisational performance. Based on the evidence gathered in CUC3 and the corresponding analysis, it was therefore deduced that participants in CUC3 believed that IS investments do contribute positively to organisational performance and were working to fully realise the benefits of both new and existing IS investments to the organisation.

Thus, for CUC3, this research not only confirmed the presence of the IT portfolio component of the conceptual model, it demonstrated its suitability and practicality as a mechanism for identifying the level of IS investment in an organisation.

Organisational Performance

As with other cases in the sample, data were collected regarding both the type of internal/external KPIs and their use/suitability to IS investment decision making. Table 8.25 lists the performance indicators identified in CUC3.

Internal	<ul style="list-style-type: none"> <li>● Staff                             <ul style="list-style-type: none"> <li>○ Staff survey</li> </ul> </li> <li>● Customer                             <ul style="list-style-type: none"> <li>○ Customer survey</li> </ul> </li> <li>● Management reports</li> <li>● Turnover</li> <li>● Technical                             <ul style="list-style-type: none"> <li>○ Service Level Arrangements (SLAs)</li> </ul> </li> </ul>
External	<ul style="list-style-type: none"> <li>● Financial                             <ul style="list-style-type: none"> <li>○ Cost to Income ratio</li> <li>○ Interest Income</li> <li>○ Non-Interest Income</li> <li>○ Interest margins</li> </ul> </li> <li>● Customer                             <ul style="list-style-type: none"> <li>○ Number of products per customer</li> <li>○ Number of members</li> </ul> </li> </ul>

Table 8.25: Key Performance Indicators in CUC3

When P13 was asked to describe the KPIs used in/by CUC3, the response was rather surprising. First, although P13 acknowledged the existence and use of performance indicators in the industry in general, P13 admitted to not being very familiar with these KPIs particularly those used in/by CUC3:

*“Am sure there are, am not particularly familiar with them. I should be, but I certainly am not particularly familiar with them.”*

This was surprising in that P13 was primarily responsible for the formulation of the IS strategy in CUC3. Under the circumstances, it was not clear if the newly formulated IS strategy did incorporate within it a set of formal KPIs. One could

argue that the development of an IS strategy would have presented P13 with an excellent opportunity for the identification, adoption and utilisation of a set of KPIs for ongoing performance measurement that would thus have further enhanced the resultant IS strategy (Sircar, Turnbow and Bordoloi 2000; Seddon, Graeser and Willcocks 2002). However, discussions with P13 did reveal the use of qualitative assessments in monitoring the implementation of IS, similar in many respects with those used in CUC2 (Chan 2000).

P14 and P15 on the other hand identified a number of KPIs as shown in Table 8.25. These KPIs are similar to those identified in the other credit union cases in the sample and their use finds strong support in the literature (Campbell 1992; Markus and Soh 1993). In addition, CUC3 like other FIs in the Australian FSS also utilised data summaries from APRA as a mechanism for benchmarking its expenditures (APRA 2003). However, and as with CUC2, there did not appear to be any mechanism that linked these KPIs with IS investment, although P13 did suggest the use management ratios derived from standard budget control mechanisms (Harris and Katz 1989; Bazley et al. 1993).

Further, CUC3 did not appear to have in place any mechanisms for cost recovery, a process that could have contributed to better IS expenditure management (Carrington, Llanguth and Steiner 1997). In this case, P13 argued that most IS investment decisions were a necessity, and hence a foregone conclusion given the transition that CUC3 was going through. The foregoing therefore suggests that this in effect could have precluded the need for the utilisation of KPIs in the IS investment decision process in CUC3 (Pearlson and Saunders 2004). Thus according to P13:

*“No, my focus, rightly or wrongly, is on the fact that if it is strategic we will just pay for it and I can even selectively, if I wish, justify what I am doing and how we will get there and arrange for the funds... That’s in terms of the phase that we are in now with all this investment happening, after that realisation, things then become operational and it more about being in budget and starting again.”*

The foregoing further solidifies the conclusion that, at the time, IS investments were perceived to be critical to the CUC3’s future growth and performance (Mckeen and

Smith 1996). However, it should be emphasised that CUC3 will need to utilise some form of performance monitoring, based on an identified set of KPIs, if its IS investments are to produce sustainable competitive advantage and hence contribute to organisational performance in the long run (Navarrete and Pick 2002).

## **Key Performance Indicators**

### **Internal KPIs**

Discussions with participants suggested that, in the past, measuring performance internally was not something that was done as a matter of course in CUC3. Despite this however, two performance indicators that did appear to have been used quite frequently were the staff survey and turnover. Similarly, P14 observed that the same apparent lack of performance monitoring might have applied to IS investment in the past as well. The foregoing appeared to be consistent with the 'utility' view of IS that had existed in CUC3 (Powell and Dent-Micallef 1997; Sohal and Ng 1998). Most recently, performance measures such as Service Level Agreements (SLAs) were introduced to overcome this shortcoming.

In addition, although traditional management control was exercised to manage the organisation, there were suggestions that this was hampered to a greater or lesser extent by the weak MIS component of the IT portfolio (Hochstrasser and Griffiths 1991).

### **External KPIs**

Discussions showed that CUC3 used similar external performance indicators to the other credit unions in the sample (Table 8.25). Participants highlighted Cost to Income ratio, Return On Equity, Interest Income, Non-Interest Income and Interest margins as being the KPIs most often used by CUC3 (Campbell 1992). These observations were largely consistent with the results from the meta-analysis (Chapter 3). In addition, the identified KPIs were also cross-referenced against industry

statistics, as reported to APRA and their validity and suitability as organisational performance indicators thus confirmed (APRA 2003).

Thus, all participants agreed that having a clear set of indicators be they qualitative or quantitative for organisational performance was necessary to better understand the business value of IS (Palmer and Markus 2000). This evidence provided strong support for the organisational performance component of the conceptual model. However, it was not clear in CUC3 how these were or could be related to IS investment. Further, participants suggested that given the necessity of the changes that were being implemented in CUC3, it was quite possible that IS investment decisions were being made without considering these performance indicators as many of these investment were considered necessary for the transformation of CUC3.

In summary therefore, it may be concluded that although the use and importance of KPIs was acknowledged in CUC3, observations were that there was very little done in the way of linking IS investment decisions to these performance indicators and vice-versa, a result that was consistent with observations in the other credit unions in the sample. In CUC3's case however, this may well be have been because of the transition that it was undergoing. Further, it was encouraging to note from discussions with participants that, as the IS strategy (and other changes) were implemented in CUC3, performance indicators could, in future, be incorporated and become more integrated into the management processes (Andreu and Ciborra 1996).

Thus, this research confirmed the presence of the organisational performance component of the conceptual model in CUC3. The model clearly confirmed that there are two aspects, internal and external, to organisational performance component whose KPIs were determined to a greater or lesser extent by the stakeholders (Freeman 1984; D'Souza and Williams 2000).

### *Considerations for Strategic Information Systems Planning*

Unlike the other two credit unions in the sample, CUC3 recently instituted a formal SISP process (Ward and Peppard 2002). Observations indicated that the approach to

SISP was a hybrid of technology-led and method-led approaches (Earl 1993). It was evident that the IS strategy process, though initiated and commissioned by the CEO (P14), was in fact wholly formulated by the EMIS (P13). However, indications were that the process was largely consultative and that input had been sought and obtained from other functional areas to ensure completeness in the IS strategy. The SISP process therefore incorporated the five critical success factors highlighted by Earl (1993). It is anticipated that as CUC3 becomes more adept at SISP, the approach will shift to becoming more of an organisational approach that is averred to be more comprehensive and effective (Earl 1993).

Thus, discussions with participants showed that in the main, all factors that constitute the considerations for SISP component were present, although there were differences in the participants with respect to the individual factors in the SISP process (Table 8.26).

Factor	P13	P14	P15
Definition of IS	No	Yes	Yes
Tracking of IS investments	Yes	Yes	No
Factors influencing investment decisions regarding IS	No	Yes	Yes
Originators of IS initiatives	Yes	Yes	Yes
Calculation of return on IS investments	Yes	Yes	Yes
Alignment of IS investment with Corporate strategy/goals	Yes	Yes	Yes
IS for competitive advantage	Yes	Yes	Yes
Efficient/Effective utilisation of IS resources by organisation	Yes	Yes	Yes
Development of policies for IS (Architectures, technologies etc)	Yes	Yes	Yes

Table 8.26: Considerations for SISP in CUC3

It was also evident that participants agreed that, although this was the first time something of this nature had been attempted in CUC3, this process had been highly effective and all believed that once implemented the IS strategy would yield the expected benefits with improvements in Operational efficiency, Customer service quality and Product delivery, and consequently organisational performance. P15 summarised this succinctly in the following statement:

*"I think its been very effective. I think its enabled the projects to kick off that have kicked off and allowed a clear path, not just for the executive*



*but also for the board. One of the things, I think, is that the effectiveness promotes both the corporate plan and IT strategic plan in that they have both been aligned, and that the board can constantly see where we are heading against a clear plan that they have endorsed”*

As alluded to earlier, the IS strategy was developed almost in parallel to the corporate strategy and consequently there will be a need in future to ensure that these two strategies are aligned during their implementation and execution (Ward and Peppard 2002). Ideally, the former should have succeeded the later to ensure stronger alignment, however, this situation was identified and was being addressed by CUC3 (Henderson and Venkatraman 1993).

In summary therefore, the presence of the consideration for SISP component in CUC3’s conceptual model was confirmed. However, it should be noted that SISP has only recently been introduced into CUC3. In fact, the first investment cycle had yet to be completed when this research was conducted. CUC3 therefore stands out in the credit union sample because it was the only credit union that had a formalised SISP in its conceptual model, thus making CUC3’s model more akin to those derived for the commercial/retail banks (Chapter 7).

### Managerial Effectiveness

As defined in the literature, the Managerial effectiveness component consists of five factors (Weill and Olson 1989). Table 8.27 lists the variables that constitute this component and their perceived impact in CUC3.

Factor	Impact (Low, Med or High)
Senior management commitment to IS	High
Firm experience with IS	Low
User satisfaction with IS	Low
The organisation’s internal political environment	High
The organisational structure	High

Table 8.27: Impact of Managerial effectiveness variables on IS investment and organisational performance relationship in CUC3

Discussions with participants clearly showed that senior management have a very important role to play in the organisation with respect to IS investments. According to P15:

*“I think that it is very important that the executive team maintains the disciplines and abides by them so that they cascade through the organisation and probably the most key person to ‘walking the walk’ rather than just ‘talking the talk’ is the Chief Executive Officer”*

P15 went further to suggest that, although this commitment may vary between individuals, it was generally of a high level:

*“Yeah, I would say they are. Whether they take total ownership of that, may be another question, but I think they are committed to it, they understand and are fully behind the need to have an efficient and effective IT management and infrastructure in place.”*

The foregoing also highlighted the need to educate senior management with respect to the importance of IS investments to organisational performance, an issue that has been identified in the literature as being both important and critical to the management of IS (Pervan 1997). Clearly senior management commitment to SISP (Davernport, Hammer and Metsisto 1989) and the resultant IS strategy (Earl 1993) were perceived by participants to be critical to the success of CUC3 going forward.

As far as organisational experience with IS was concerned, discussions with participants indicated that CUC3 exhibited a low level of organisational experience with IS despite the fact that IT had been in use in the organisation for a long time. This observation was consistent with observations regarding the previously low status of IS in CUC3 and its attendant consequences for the level of investment in IS to date (Andreu and Ciborra 1996). This situation was anticipated to change with the implementation of the new IS strategy.

User satisfaction was also considered low in CUC3. Again this was consistent with observations of previously low investment in IS. Discussions with participants revealed the lack of renewal in parts of the IT portfolio eventually led to an ageing infrastructure which in turn affected user satisfaction (Mckeen and Smith 1996).

What was striking however, was the fact that staff were still able to provide a high level of customer service and in essence made up for the shortcomings in the IT portfolio. Thus by having a very high and consistent level of customer service quality CUC3's staff effectively shielded customers from any shortcomings in CUC3's systems (Sievwright 2002; Reynolds and Ochalla 2003). P14 highlighted this aspect as follows:

*"our members in many instances have been protected from this by virtue of the human interface...And one of the things is the focus is on service and there is a culture of providing service. So people have overcome and stretched to cover for system inadequacies."*

P13 concurred with this assessment:

*"...as an organisation, we have a perception, and this is one thing that we do, is that we are very polite, very caring and many of the members are known personally. So when things do go wrong, we make up for it in other ways."*

Despite the foregoing, participants recognised the fact that in the long term, consistently high levels of customer service quality could prove unsustainable, hence the drive to implement an IS strategy and improve CUC3's IT portfolio. In the long term, these improvements to the IT portfolio were envisaged to assist staff in providing the level of service and support that CUC3's members had become accustomed to (Willcocks, Feeny and Islei 1997). In addition, it was expected the users' experience with IT would improve significantly and result in more satisfied users. This last aspect was considered significant as user satisfaction has been demonstrated to have significant implications for performance (DeLone and McLean 1992).

The fourth factor in the Managerial effectiveness component relates to the organisational culture in general and organisational politics in particular. This factor was observed to have had a high impact in CUC3 in the past, much of which may be considered negative (Wood et al. 2004). However, this issue has been recognised and management were endeavouring to change the organisational culture such that organisational politics could be used as a positive influence on the organisation in

general and with respect to IS investment and management in particular. According to P14:

*“The politics of power and the demands of commitment within the people to achieve obviously is benefiting us right now.”*

The literature recognises the fact that this issue can have both a negative and positive impact and emphasises that how this issue is managed will determine the resultant effect (Wood et al. 2004).

Last but not least, the organisational structure factor was observed to have a high impact on CUC3 (Avison, Cuthebertson and Powell 1999). At the time of this research, the impact of the previous structure was considered negative. Discussions with participants indicated that, the previous organisational structure hampered the effective and efficient utilisation of IS in CUC3 (Raymond, Pare and Bergeron 1995). In recognition of this, a new structure had recently been implemented that was believed to enhance the management of IS and ensured that CUC3 obtained the maximum benefit from its IS investment (DeCanio, Dibble and Amir-Atefi 2000).

Clearly, Managerial effectiveness plays an important role in the IS investment and organisational performance relationship. The above results therefore support the existence of the Managerial effectiveness component in the conceptual model for CUC3.

Thus, this research confirmed the presence of the Managerial effectiveness component of the conceptual model. The results further confirmed the five factors that constitute Managerial effectiveness and showed that they have an overall medium to high impact on the IS investment and organisational performance relationship in CUC3.

### Context

With regards the contextual issues that surround CUC3, participants' identified two key issues that they believe may have influenced IS investment in the organisation. These issues were regulation and competition.

As discussed in Chapter 2, the FSS is regulated and consequently FIs may, at times, incur costs associated with mandatory IS investments that may be required by the regulating authority (Carrington, Llanguth and Steiner 1997). Second, IS investments were perceived to have an impact on CUC3 in that they were geared to enable CUC3 to compete effectively with its competitors in the FSS, who include other credit unions and commercial/retail banks (Hunter and Hitt 1997; Duncan and Elliot 2002). Such IS investments were considered discretionary. These observations were similar to those noted in the other credit union cases and the commercial/retail banks cases. However, with CUC3 being in the process of transition, it was noted that most of its IS investments, at the time, were considered necessary and vital to its future growth and development.

One unique characteristic of the credit union industry in Australia is the fact that there is a high level of collaboration between credit unions as they share a common TPS (CUSCAL 2003). This was borne out by results from interviews in CUC3. Clearly, this has had a significant influence on the composition of IT portfolios of all credit unions, including CUC3 (Clemons and Knez 1988).

The results of the research in to the contextual issues around CUC3 clearly indicated that context plays a crucial role in the IS investment and organisational performance relationship (Avgerou 2001). Yet, a review of past literature revealed that this issue has largely been ignored possibly due to the predominance of positivist/quantitative research methods which may not have effectively captured the effects of context on IS (Trauth 2001). Further, the results of this research provided strong support for the choice and use of the Case research method which enabled the deliberate consideration and interpretation of the effect of context on the IS investment and organisational performance relationship.

Thus, this research confirmed the influence of context on a FI's IS investment and organisational performance relationship.

### 8.4.3 Extended Conceptual Model for CUC3

Following the application of data gathered in CUC3, the original conceptual model was extended to reflect the findings from this case as illustrated in Figure 8.6.

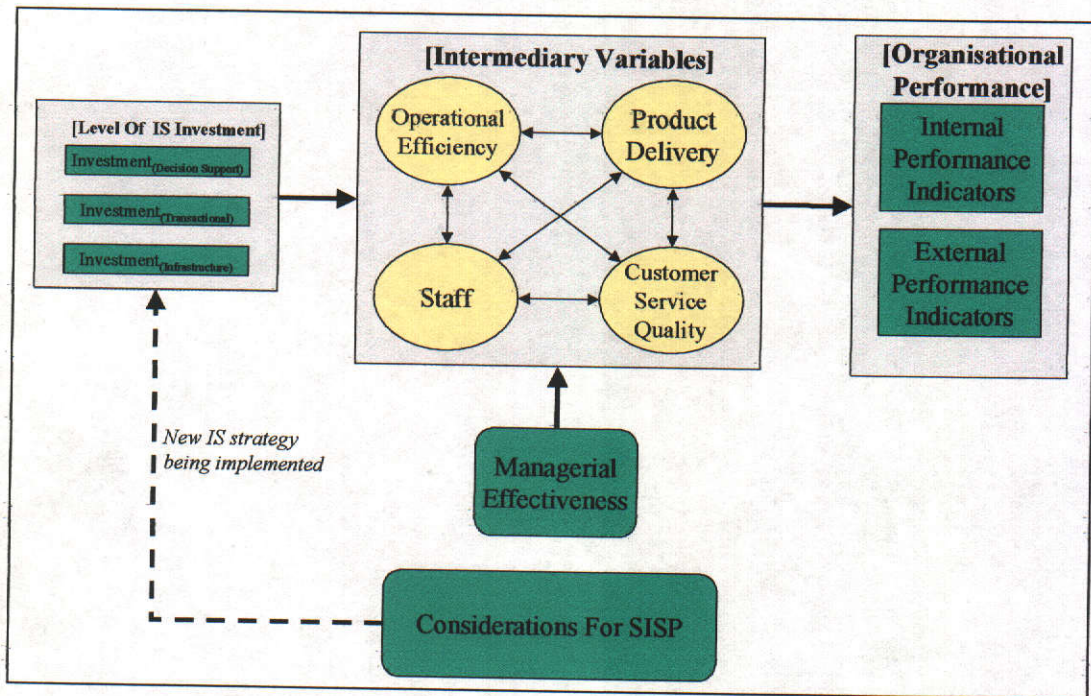


Figure 8.6: Extended conceptual model for CUC3

The extended conceptual model illustrated in Figure 8.6 has the following characteristics:

1. Confirms the presence of the all the components of the conceptual model
  - a) Level of Investment IS (IT portfolio)
  - b) Organisational performance
  - c) Considerations for SISP
  - d) Managerial effectiveness
2. Extends the conceptual model by showing an intermediary set of variables, Operational efficiency, Staff, Customer service quality and Product delivery leading to the conclusion that relationship between IS investment and organisational performance is positive but indirect.
3. Shows that in CUC3, SISP was recently introduced as in this first cycle, the feedback loop has yet to be completed. This in effect supports initial

suppositions including the temporal effect (time lags) of the SISP feedback loop (Weill 1992).

Looking at the IS investment component of the extended conceptual model for CUC3, it was evident that CUC3 has suffered from a lack of consistent IS investment in the past. Discussions with participants revealed that, in the past, CUC3 had a highly autocratic culture in which the focus on cost management was very high (Mintzberg and Quinn 1996). This combined with the previously low status of the IS department resulted in the situation just described.

Despite these shortcomings, it should be noted that up until a few years ago, CUC3 had in fact been a (financially) successful FI within the Australian FSS (CUC3 2003a). Discussions with participants revealed that it may have been as a result of the financial success enjoyed by CUC3 that investment in IS may have been considered to be secondary based on the argument that the FI was seemingly able to thrive with minimal IS investment. Consequently, the IT portfolio became increasingly outmoded and aged due to the lack of a consistent policy for renewal of IT. The foregoing suggests that CUC3 had, in effect, become a victim of its own success with respect to IS investment.

With changes in the organisation and its environment, came the realisation that the previous situation was not sustainable. Thus, changes to CUC3 were initiated beginning with the organisational structure and business model. In addition, a SISP process was also initiated that resulted in the development and implementation of an IS strategy, a characteristic that distinguishes CUC3 from the other credit unions in the sample (Figure 8.6). Participants accepted that this process was still very much driven by the IT function, but noted that it would improve as the organisation became more experienced with SISP (Galliers and Baker 1994).

Despite the foregoing, participants noted that many of the intended benefits were already being realised within the first six months of the IS strategy being drawn up and implemented. Therefore it is anticipated that, in time, the secondary relationship between performance and IS investment will be completed and CUC3 will extract even more benefits from its IS strategy and associated investments. Thus, it was evident that there was anticipation that CUC3 could achieve much higher levels of

growth and performance than had previously been the case and it was expected that these would increase with improvements in SISP (Ramani and Pavri 1994).

Given the foregoing, it was therefore logical to expect the Managerial effectiveness component to be present in CUC3's conceptual model, with high levels of senior management commitment. Analysis showed that this was indeed the case and it was consequently deduced that the impact of Managerial effectiveness on the IS investment and organisational performance relationship was significant as it influenced the nature, type and level of IS investments (Markus and Soh 1993). The results also confirmed the presence and impact of the other factors that constitute Managerial effectiveness in the conceptual model for CUC3.

Another important feature of the extended conceptual model for CUC3 that differentiates it from the original conceptual model was the derivation of a set of intermediary variables as shown in Figure 8.6. This research clearly showed that IS investments were perceived to impact most on a set of intermediary variables: a) Staff, b) Product delivery, c) Operational efficiency and d) Customer service quality (Discussed further in Chapter 10). The derivation of these variables was significant as it facilitated a better understanding of the IS investment and organisational performance relationship in CUC3. Closer examination of these variables and comparisons with the literature suggested that they may not stand in isolation and may in fact interact with each other however further research is required to establish their potential interactions (Chapter 10). Thus, the extended conceptual model for CUC3 shows that IS investment (the IT portfolio) impacts positively upon organisational performance by influencing improvements in the areas defined by the set of intermediary variables (Robson 1997; Willcocks and Lester 1999; Pearlson and Saunders 2004).

The foregoing analysis clearly demonstrates how this research was able to identify and confirm the components of the conceptual model and thus develop an extended conceptual model explained the IS investment and organisational performance relationship in CUC3. The results were consistent with those obtained in the other cases in the sample and it may be concluded therefore that such consistency provides strong support for the strength and robustness of the research design and the reliability of the research instruments.



The next section presents discussions relating to the derivation of a composite extended conceptual model for the credit union cases. Cross case analyses were performed using the individual credit union case reports in Sections 8.2 to 8.4 that then resulted in the composite extended model.

## 8.5 Composite Extended Model for Credit Union Cases

Table 8.28 summarises the key similarities and differences in the results obtained from the cross-case analysis of the credit union cases.

ITEM	CUC1	CUC2	CUC3
Structure	Hierarchical	Hierarchical	Hierarchical
IS investment threshold	Accepted, but not quantified (calculated average of 14.82%)	Accepted, but not quantified (estimated to be approximately 5%)	Accepted and estimated to be approximately 10%
IT Portfolio	Represents IS investments and affects IS investment decision making	Represents IS investments and affects IS investment decision making	Represents IS investments and affects IS investment decision making
Intermediary variables	Operational efficiency Staff Customer service quality Product delivery	Operational efficiency Staff Customer service quality Product delivery	Operational efficiency Staff Customer service quality Product delivery
Organisational performance	Affected by IS investments	Affected by IS investments	Affected by IS investments
Considerations for SISP	No formal SISP	No formal SISP	SISP recently introduced
Managerial Effectiveness	Accepted and perceived to affect IS investment decisions	Accepted and perceived to affect IS investment decisions	Accepted and perceived to affect IS investment decisions
Impact of Context	Accepted, perceived to affect IS investment decisions	Accepted, perceived to affect IS investment decisions	Accepted, perceived to affect IS investment decisions

Table 8.28: Summary of key similarities/differences in the credit union cases

Beginning with the organisational structure, results from the credit union cases indicated that all the credit unions in the sample exhibited hierarchical structures built along clearly defined functional lines, although there were differences in the actual

detail of the structures of each of the credit unions (Mintzberg and Quinn 1996), possibly arising from differences in their business strategies (Porter 1980).

For instance, CUC1 did not have an IS department and the responsibility for IT was shared between the General Manager and the Manager Finance and Administration. In CUC2, a small IT department was present, but its role was very much a support role focussing primarily on technical support issues relating to the infrastructure component of the IT portfolio. Consequently, the IT department had a low status in the organisation and did not have a direct reporting line to the CEO as might be found in organisations in which IS has a more strategic function (DeCanio, Dibble and Amir-Atefi 2000). CUC3 on the other hand also had a small IS department, with the difference being that CUC3 was in a state of transition such that the role of IS department had changed from one that was purely technical to a more strategic focus (Pearlson and Saunders 2004). Thus, in CUC3, the IS department had a direct reporting line to the CEO.

In all of the credit unions in the sample, the concept of an IS investment threshold was accepted as a potentially significant and useful tool. Therefore, participants generally agreed that this concept could be utilised in the management of IS investments and in determining appropriate levels of IS investment (Bender 1986; Harris and Katz 1989). However, it was observed that this concept was new to most of the participants in the credit unions. Further, when it came to quantifying the respective IS investment thresholds, observations indicated that the credit union cases had varying figures (actual and estimated) for this threshold. However, even with these variations, observations indicated that the levels of the IS investment thresholds in the credit unions were consistent with evidence from the literature (Bender 1986).

The most significant finding of the research was the identification of a set of intermediary variables in the IS investment and organisational performance relationship upon which IS investment were deemed to have a direct impact. The emergence of this set of variables led to the conclusion that the relationship between IS investment and organisational performance is positive, but indirect. This result was significant as it supported results obtained in the meta-analysis as reported in Chapter 3. Significantly, all the participants in all the credit union cases identified the

same set of variables. This consistency in results was also significant as it provided essential support for the validity and reliability of the research design, the case study protocol and research instrument (Neuman 2000; Miles and Huberman 1994). Thus, all participants concurred that IS investments in their FIs have been directed at producing improvements in Staff (morale, satisfaction etc), Operational efficiency (processing efficiency), Product delivery (existing and new channels) and Customer service quality. By enhancing these areas, IS investments were deemed to bring about improvements in organisational performance (DeLone and McLean 1992; Ward and Peppard 2002; Pearlson and Saunders 2004).

With respect to organisational performance, the research sought to identify the most appropriate KPIs that may be utilised by FIs to effectively measure the impact of IS investment upon organisational performance. In all cases, most of the KPIs used were predominantly financial. These included Return On Investment (ROI), Return On Equity (ROE), Net Interest Income, Non Interest Income and Cost to Income (Campbell 1992; Carrington, Llanguth and Steiner 1997). Since credit unions are regulated by the same authority as other Authorised Deposit-taking Institutions (ADIs) and have the same reporting requirements, there appeared to be more consistency in the use of external KPIs for reporting both to the regulator and to other stakeholders through the use of generally accepted financial reporting standards (Bazley et al. 1993; Wallis et al. 1997). Thus, it appeared that credit unions were able to pick and choose those indicators that they found to be most indicative of their performance and best understood by the stakeholders for whom the reports are designed (D'Souza and Williams 2000).

Internally, credit unions used a variety of KPIs and there did not appear to be any standards or consistency in this regard. Observed indicators were categorised into User/Customer (such as surveys), Financial (such as Actual versus Budget) and Technical (such as Service Level Agreements and Benchmarking). Research results therefore confirmed the existence of the organisational performance component of the conceptual model for the credit union cases in the sample.

In two of the three credit union cases, CUC1 and CUC2, there was no formal SISP and hence this component of the original conceptual model was not present in their extended models. CUC3 on the other hand had recently undertaken to develop an IS

strategy. Discussions with participants in CUC3 led to the conclusion that the SISP component does influence the IS investment and organisational performance relationship. In addition, the issue of time lags was also highlighted as CUC3 had yet to complete a full cycle of their IS investment process and hence had yet to review the effects of their most recent IS investments on organisational performance (Ballantine, Galliers and Stray 1996; Weill 1992). However, participants noted that the process of implementing an IS strategy had already begun to yield benefits to CUC3.

With respect to Managerial effectiveness, all credit unions in the sample confirmed that this component strongly influences the IS investment and organisational performance relationship. Table 8.29 summaries the similarities and differences relating to the Managerial effectiveness component as observed in the participating credit unions. In all cases, senior management commitment was considered 'high', whereas organisational experience (with IS) and user satisfaction were considered low to medium.

Factor	CUC1	CUC2	CUC3
Senior management commitment to IS	High	High	High
Firm experience with IS	Low	Medium	Low
User satisfaction with IS	Medium	Medium	Low
The organisation's internal political environment	Low	Low	High
The organisational structure	High	High	High

Table 8.29: Presence and impact of Managerial effectiveness factors

Only CUC3 displayed a high level of internal politics, an issue that was identified as having been inherited from a previous managerial regime, with possible negative implications for IS investment (Wood et al. 2004). However, discussions indicated the new management team was working towards minimising any potentially negative effects and maximising the positive aspects. The last variable in this component is organisational structure and in all cases, it was observed that this factor had a strong influence on the management of IS investment in the credit unions.

Lastly, the issue of context and its impact on credit unions in particular was considered and it was noted that the issues that affected other types of FIs in the Australian FSS also affected credit unions (Crapp and Skully 1985; Mckillop,

Charles and O'Rourke 1997). Participants therefore highlighted two issues that influenced the type of IS investments made by FIs in general and credit unions in particular made two types of IS investments. These issues were regulation and competition that resulted in mandatory and discretionary IS investments respectively.

For credit unions, mandatory IS investments held special implication because of their size and capacity for change and it is arguable that some types of mandatory IS investments could significantly (negatively) impact credit unions financially. In addition, all participants agreed that IS investments were targeted at enabling their FIs to compete, particularly against the much larger commercial/retail banks (Reynolds and Ochalla 2003). Further, it was generally agreed that IS investments could also have a dual effect whereby they could also influence the environment and thus alter the manner in which FIs compete (McFarlan 1984).

Having considered all of the foregoing, a composite extended conceptual model was derived for the credit union industry as illustrated in Figure 8.7.

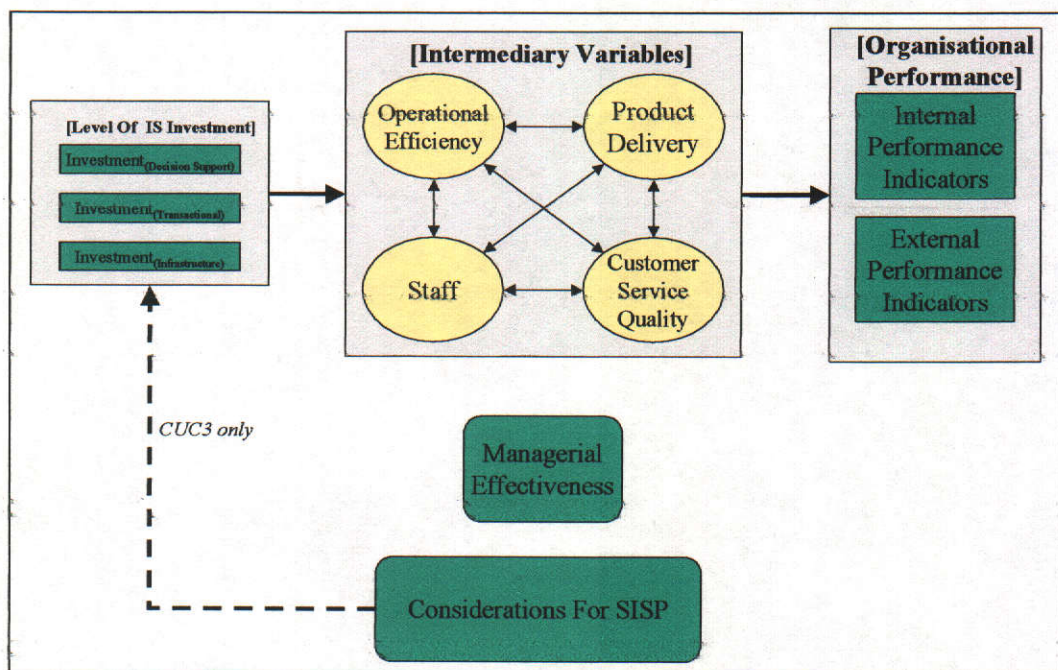


Figure 8.7: Composite extended conceptual model for credit unions in the sample

Thus, this research has shown that the conceptual model was able to address the research questions and the application of Case research resulted in the derivation of a

composite extended model that explains how IS investment and organisational performance were related in a sample of credit unions in the Australian FSS.

The results of this research were therefore significant as they contribute to a better understanding of the IS investment and organisational performance relationship. In addition, the extended conceptual model identified areas that might be targeted by FIs in order to gain the maximum benefit from IS investments. However, further research may be required to determine the generalisability of these results to a much larger population.

## **8.6 Chapter Summary**

This chapter presented the credit unions cases that participated in the research project. The research sample consisted of three credit unions; one small, one medium and one large sized credit union. In each case, three participants were nominated and interviewed, except in CUC2 where four participants were available. Interviews with the participants constituted the primary data, with significant amounts of other data being collected to support the primary data and enable triangulation of data during analysis.

For each of these cases, the research instrument was applied and data collected and analysed according to the case study protocol. Analysis consisted of within-case analyses that resulted in an extended conceptual model being derived for each case. In addition, cross-case analyses were performed resulting in a composite extended conceptual model for the credit union cases.

Results indicated that the extended conceptual models derived for the credit union cases were similar with one exception (CUC3). Of particular note in the extended conceptual models was the emergence of a set of intermediary variables. Thus the data suggested the existence of a set of variables upon which IS may impact and consequent changes in these variables may then result in improvements in organisational performance. These variables were identified as Operational efficiency, Staff, Customer service quality and Product delivery. The consistency of

the results pointed to both the validity and reliability of the case study protocol and research instrument.

As in the commercial/retail bank cases, discussions with participants suggested that there were different levels of emphasis placed on each of the intermediary variables (determined to a greater or lesser extent by the corporate strategy). Further, it was noted that these variables do not stand in isolation of each other and that there was some interaction between these variables.

In summary therefore, the four objectives initially set out in the introduction to this chapter were achieved successfully. First, the case study protocol, and research instrument, were further validated and verified. Second, the components of the original conceptual model (IS investment, Organisational performance, Managerial effectiveness) were verified to be present with the exception of the considerations for SISP component. Only one credit union had a formal IS strategy, although it did not demonstrate that it had executed the complete SISP process at the time of the research. Third, the IS investment and organisation relationship was tested and showed the existence of a set of intermediary variables that moderate this relationship in each case. Finally, a composite extended conceptual model was derived that clearly depicts and explains the IS investment and organisational performance relationship in credit unions.

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# 9.0 Preliminary Testing of Conceptual Model

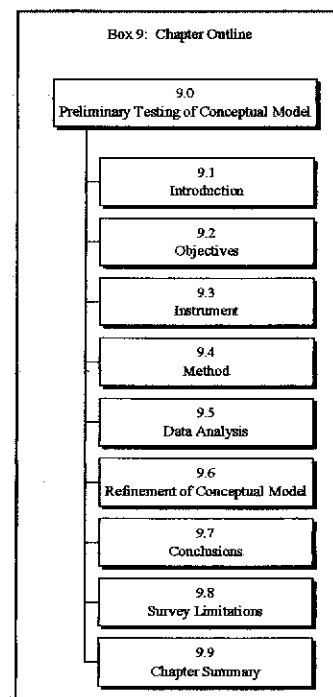
## 9.1 Introduction

As outlined in Chapter 6 (Research Design), this research utilised both Case research and Survey methods to develop, test and refine the conceptual model. This chapter presents the results and analysis of the preliminary testing and refinement of the conceptual model as a follow-up to the development of the model through Case research. Essentially, the preliminary testing reported in this chapter was aimed at refining of the conceptual model and testing its generalisability within the FSS. Box 9 outlines the layout of this chapter.

Section 9.2 presents the objectives of the model-testing phase. Section 9.3 presents a review and discussion of the survey instrument and Section 9.4 the method followed by the presentation and discussion of the results and data analysis (Section 9.5).

The results of the survey are compared with the results obtained from the cases and the extant literature to demonstrate: a) how these results support the findings in Chapters 7 and 8, b) to refine the conceptual model, and c) contribute to a better understanding of the IS investment relationship (Section 9.6).

Section 9.7 then presents the conclusions drawn from the testing, followed by a discussion of the limitations of the survey (Section 9.8). Finally, the chapter concludes with a summary of the preceding discussions relating to the preliminary testing of the conceptual model.





## **9.2 Objectives**

As discussed in Chapter 6, many researchers now advocate the use of a pluralist approach to research, particularly when conducting exploratory research (Mingers 2001). Thus, this research utilised both case and survey research methods to achieve further convergence of the results obtained, where Case research was used to develop and test the conceptual model and the survey method was used to provide preliminary testing/refinement of the resultant model. The survey is reported in this chapter and had the following objectives:

1. To provide preliminary testing of the conceptual model and thus provide a basis for comparative/confirmatory analysis with the Case research results.
2. To refine the conceptual model.
3. To demonstrate the generalisability and suitability of the conceptual model by extending the research beyond the case sample.

The following sections provide a detailed description of the survey instrument and method to further demonstrate their rigour, validity and reliability and thus explain how they were employed to achieve the above objectives.

## **9.3 Instrument**

The survey instrument was developed utilising guidelines provided by Neuman (2000) and Sekaran (2000) and had the following characteristics:

1. Clear, easy to read design.
2. Clear, unambiguous questions.
3. Clear instructions on how to answer the questions.
4. Use of a five (5) point Likert scale.
5. Minimal effort required to complete questionnaire with respondents being provided options where necessary from which they simply made the appropriate selection by ticking the relevant boxes.

6. A section for additional comments.

As this instrument was aimed at providing preliminary testing of the conceptual model, it was logical that the survey instrument be an adaptation and extension of the original Case research instrument. The survey instrument had ten sections as summarised in Table 6.9. Appendix 3-1 contains a copy of the survey research instrument and the development of the survey instrument is discussed in detail in Chapter 6.

## **9.4 Method**

The FIs selected for the survey sample were drawn from the list of Authorised Deposit-taking Institutions (ADIs) as published by APRA and full contact details were then obtained from each FI's website or by telephone (APRA 2004). The survey instrument was distributed via post to 242 ADIs operating in the Australian FSS in early March 2004 and respondents were given a two-month period within which to complete and return the questionnaires. Each mail package contained a covering letter, the survey instrument and a reply paid envelope and was personally addressed to the CIO of each FI (Appendix 3-1). Follow-up emails were sent to each FI after an initial four-week period had elapsed from the time of mailing. A second and final set of follow-up emails was subsequently sent after another two-week period had elapsed. Each of these emails was similar to the original mail package and contained a copy of the cover letter and survey instrument. Respondents were also encouraged to utilise the electronic copy as an alternative to the original hard copy if they so chose. The use of follow-up strategies such as the one described above is an accepted research practice that helps boost response rates (Sekaran 2000).

Upon receipt, all responses were collated and filed. The responses were then used as input into the statistical package SPSS v11.5 that was used to analyse the data.

## **9.5 Data Analysis**

The following sub-sections present the results and data analysis from the survey. The data analysis begins by presenting demographic data regarding the participating FIs and respondents. This is then followed by the presentation and analysis of organisational data relating to the IS functions of each FI to gain a better perspective of IS management within these FIs. Subsequent to that follows the presentation and analysis of data relating to each of the components of the conceptual model.

### **9.5.1 Demographic Data**

Table 9.1 shows the distribution of the total population of Authorised Deposit-taking Institutions (ADIs) in the Australian FSS from which the sample of FIs targeted by the survey was drawn (see Chapter 2 for a detailed discussion of the structure and composition of the Australian FSS).

<b>Category</b>	<b>Primary Activity</b>	<b>Total Count</b>
Australian-owned Banks	Commercial/Retail	14
Foreign Subsidiary Banks	Commercial/Retail	10
Branches of Foreign banks	Commercial/Retail	29
Building Societies	Mutual Societies	14
Credit Unions	Mutual Societies	177
Other ADIs	Companies run by industry bodies to provide specific services	5
ADIs in Liquidation	As per category name	6
<b>Total</b>		<b>255</b>

Table 9.1: Composition of Australian FSS

The total population consisted of 255 FIs. Of these, 13 were eliminated as they were either in liquidation or classified as ‘Other ADIs’. The total number of responses received was 21 out of a possible 242 giving a total response rate of 8.7%.

Appendix 3-2, Table A3.19 shows the actual distribution of FIs in the sample. The majority of respondents (76.2%) were credit unions followed by commercial/retail banks (9.5%) with friendly/building societies at 4.8%. All of the FIs that responded were Australian owned. Figure 9.1 illustrates this distribution.

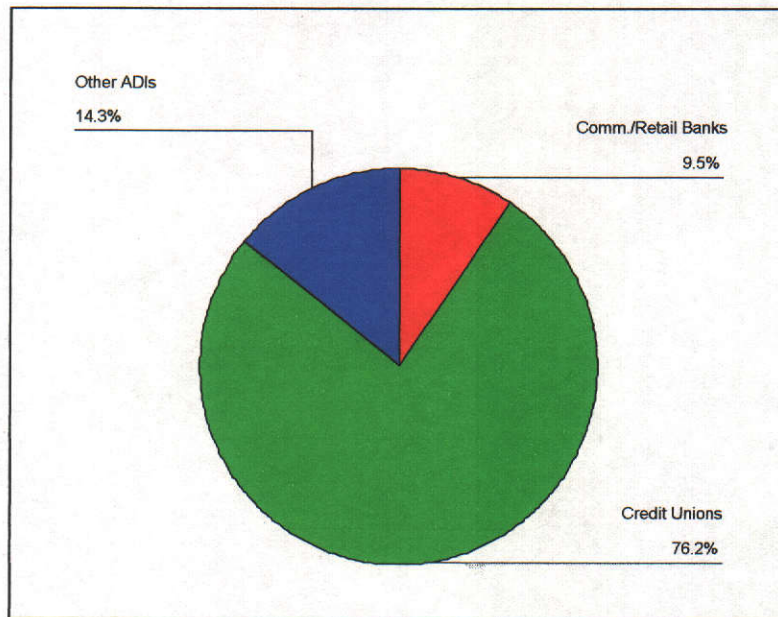


Figure 9.1: Distribution of respondent FIs in survey sample

The average age of respondents was 45.95 years with ages ranging from 33 years of age to 62 years of age. All respondents were well educated with the majority (33.3%) having at least a Bachelor's degree and an average of approximately 19 years experience in IS thus suggesting that the data was reliable given the experience and education levels of respondents (Appendix 3-2, Tables A3.1 and A3.2 respectively).

A chi-square test was applied to compare the distribution of FIs in the sample with that of the population and thus determine the sample's representativeness. The test produced a chi-square value of 0.815, with 2 degrees of freedom and an asymptotic significance of 0.665 indicating that sample was indeed representative of the total population of FIs.

The relatively low response rate (8.7%) was indicative of the difficulties of conducting research in the FSS as initially observed during the Case research phase. However, given the exploratory nature of this research, the data set was considered adequate for the preliminary testing of the conceptual model. In addition, the data obtained from the survey served a useful purpose in triangulating with the Case research data and the literature.

## **9.5.2 Organisational Data**

The sample exhibited a wide variation in terms of the size of the annual IS budgets of the individual FIs. IS budgets ranged from AUD\$20,000 p.a. to AUD\$30,000,000 p.a. (Appendix 3-2, Table A3.3). Responses to questions regarding the existence of an IS department within each FI in the sample indicated that only 47.6% of FIs in the sample actually had an IS department. This result was consistent with the relatively small size of the majority of the respondents.

Despite the apparent lack of 'proper' IS departments (mostly in the credit unions), it was noted that in the majority of cases the IS function was centrally managed and with 50% of all respondents citing that their IS function had a direct link to the CEO (Appendix 3-2, Table A3.4). This was particularly significant as it highlighted the fact that FIs realise the role and importance of IS to organisational performance (Avison, Cuthebertson and Powell 1999; DeCanio, Dibble and Amir-Atefi 2000). Furthermore, this result was also significant in that it provided support for the organisational structure factor in the Managerial effectiveness component of the IS investment and organisational performance conceptual model.

## **9.5.3 Level of IS Investment (IT Portfolio)**

As alluded to earlier, data regarding the size of IS budgets varied widely for the sample with the following distributions a) Training (average 4.26%), b) Software (average 33.8%), c) hardware (average 22.7%) and d) licensing (average 34.9%). These results supported evidence in the literature that FIs continue to invest significantly in IS on an ongoing basis (Chapter 2).

### *IS Investment Threshold*

The concept of an IS investment threshold is one that could be used by FIs to better understand their IS investments and thus enable them to gauge their IS expenditures relative to other FIs in the FSS (Chapter 2). Table 9.2 shows the relative IS investment thresholds of the commercial/retail banks and credit unions in the sample.

Type of FI	IS Investment Threshold
Credit unions	16.55
Commercial/retail banks	7.50
All other ADIs	30
Average for sample	16.88

Table 9.2: Comparison of IS investment thresholds across industries in FSS

As can be seen in Table 9.2, the credit unions in the sample appear to have a much higher IS investment threshold compared to the commercial /retail banks in the sample. One possible explanation for these differences lies in the fact that credit unions in the Australian FSS tend to have higher cost to income ratios (over 70%) compared to commercial/banks whose cost to income ratios tend to be much lower (below 50%) (APRA 2003).

Significantly, the average IS investment threshold for the sample was found to be 16.88% (Appendix 3-2, Table A3.5). These results were noteworthy as they supported results obtained from the Case research that suggested that the IS investment threshold ranged between 5% and 20%. More importantly the IS investment threshold for the sample was close to the 15% threshold as determined by Bender (1986). Further, 57.1% of respondents agreed that there was a minimum IS investment threshold required by FIs in order for them to remain competitive.

In addition, respondents were also asked to rate what they believed was the relative importance and contribution of these IS investments (Appendix 3-2, Table A3.7 and A3.8). Results showed that the TPS component was on average rated the highest in terms of importance (4.65) and contribution (4.48). On the other hand, even though infrastructure was on average rated higher than MIS in terms of its importance to FIs (4.15 vs 3.90), its contribution to the organisation was rated lower on average than that of MIS (3.60 vs 3.71). These results were in line with and supported results obtained from the cases which showed that FIs tend to invest more in their TPS than the other components of the IT portfolio, followed by infrastructure and MIS. Investments in infrastructure were considered necessary, as they were required to ensure that this component had adequate flexibility and scalability to support the other two components.

One of the difficulties cited in earlier research has been the lack of well-defined measures that best define IS investment (Kauffman and Weill 1989; Harris and Katz

1989). This research sought to address this shortcoming as part of the development of the conceptual model by identifying those indicators/ratios that best define the IT portfolio and consequently may be related to organisational performance. Thus, respondents identified: 1) IT expense/Total Assets, 2) IT expense budget (Total IT expenditure), 3) Fixed Software maintenance costs and 4) Software development project costs as being those indicators.

Further, analysis indicated that 50% of the respondents agreed that the ratios were appropriate although only 40% agreed that these measures were in any way linked with organisational performance (Appendix 3-2, Tables A3.9 and A3.10). In addition, respondents identified: a) Charge by cost centre, b) IT depreciation, c) Project budgets, d) Activity Based Costing, e) Monthly reporting to board, f) Actual vs Budget control, g) Comparisons (benchmarking) with competitors and h) Management control as mechanisms utilised within their FIs to manage IS investments. These results were important as they form the basis upon which more quantitative analyses may be undertaken, in future, to further test and refine the conceptual model (Cron and Sobol 1983; Harris and Katz 1989).

Although these results were encouraging, more extensive testing is required to verify the suitability of these indicators and their ability to explain IS investment within the conceptual model. Suffice to say, the results of the survey confirmed the existence of the IS investment (IT portfolio) component and identified IS related ratios that could potentially be used as variables to quantify the level of IS investment in future research. In addition, the results also confirmed the existence of, and quantified the level of the IS investment threshold.

#### **9.5.4 Organisational Performance**

Respondents were requested to identify those KPIs that their FIs utilised to best measure organisational performance (Appendix 3-2, Tables A3.11 and A3.12). In total, 26 internal and 28 external KPIs were identified as shown in Table 9.3.

Although the use of these KPIs, particularly those in the financial category, was consistent with the reporting requirements specified by the regulatory authority and

industry reporting best practice (APRA 2003), analysis indicated that there was little consistency in the use of performance measures reported by respondents as different FIs chose to emphasise upon different measures. Significantly, there did not appear to be any specific and comprehensive KPIs related to IS investments.

Category	Internal KPIs	External KPIs
Financial	Budget P/L performance Capital adequacy ratio Cost to Income ratio Delinquency Deposit growth Expenditure Expenses/Average Assets Interest margin Liquidity ratio Loans growth Long term growth Net Profit Non Interest Income/Total Income Operating expense/income Operating expense/total assets Product usage Profitability Return On Assets Return On Equity Total Asset growth Total expenses/Average expenses	3-BL (Social, Environment and Financial) Asset quality Capital adequacy ratio Capital/risk weighted assets Capital/risk weighted assets Cost to Income ratio Delinquency Deposit growth Expenses/Average Assets Financial reporting Interest margin Liquidity ratio Loan Delinquency Loans growth Long term growth Net Profit Non Interest Income/Total Income NPAT/Average assets Operating expense/income Operating expense/total assets Profitability Return On Assets Return On Equity Share price Total Asset growth Total expenses/Average expenses
Staff related	Staff Satisfaction Staff Turnover	3-BL (Social, Environment and Financial)
Customer Related	Complaints ratio Customer satisfaction	3-BL (Social, Environment and Financial) Member base Complaints ratio
Technology Related	System Uptime (including SLAs)	None

Table 9.3: Internal and external KPIs for the sample

Despite the apparent inconsistencies due to the multiplicity of KPIs, closer inspection showed that this feature of the FSS can easily and clearly be explained using Stakeholder theory which in turn provided strong support for the relevance of utilising Stakeholder theory in the development of the conceptual model (Freeman 1984; Key 1999; Jawahar and Mclaughlin 2001).



Therefore, it may be argued that since organisations have a variety of stakeholders each with differing expectations and requirements, they tend to tailor their reporting requirements to meet the needs of these stakeholders and consequently, the KPIs utilised will vary resulting in the foregoing multiplicity of variables.

Thus, the results of the survey were similar to and supported results obtained from the cases regarding the organisational performance component (Chapters 7 and 8). In addition, these results also supported the findings of the meta-analysis (Chapter 3). Further, respondents appeared to agree that the KPIs utilised may not adequately capture the contribution of IS investments to performance (average 2.40) and appeared neutral (average 3.10) when asked whether these KPIs were a consideration during the IS investment decision making process.

Tables A3.20 – A3.23 (Appendix 3-2) show the differences in the use of KPIs between commercial/retail banks and credit unions. Tables 9.4 and 9.5 (derived from Tables A3.20 – A3.23) summarise these data by showing the most commonly cited KPIs in each of the two industries respectively.

The set of KPIs obtained for the commercial/retail banks in the survey (Table 9.4) confirmed the consistency in use of KPIs within that industry and were comparable to the results obtained for the commercial/retail banks in the Case research (Chapter 7).

Internal KPIs	External KPIs
Loans growth	Loans growth
Deposit growth	Deposit growth
Total Asset growth	Total Asset growth
Profitability	Profitability
Customer satisfaction	Share price
Share price	Return On Equity
Staff satisfaction	Cost to Income ratio
Return On Equity	Long term growth

Table 9.4: Most commonly cited KPIs in commercial/ retail banks

The set of KPIs for the credit union sample (Table 9.5) on the other hand was less consistent, when compared to the results from the Case research (Chapter 8). The results also confirmed observations in the literature as to the apparent lack of

consistency of application of KPIs and were consistent with the results obtained from the Case research regarding the lack of consistency in KPI use in credit unions.

Internal KPI	External KPIs
Capital adequacy ratio	Capital adequacy ratio
Liquidity ratio	Profitability
Profitability	Liquidity ratio
Return On Assets	Total Asset growth
Interest margin	Return On Assets
Operating expense/income	Interest margin
Total Asset growth	

Table 9.5: Most commonly cited KPIs in credit unions

Most significantly, this preliminary research has enabled the identification of the most commonly cited KPIs which could thus form the basis for a set of variables that could be utilised in future research, that if used consistently could produce results that are more comparable and generalisable thereby addressing a key weakness identified in much of the earlier research. However, further research is recommended to refine the sets of KPIs for both the commercial/retail banks and the credit unions in order before their application in this regard.

### 9.5.5 Intermediary Variables

As part of the preliminary testing, the survey was designed to verify the intermediary variables identified during the Case research phase. The results of the survey regarding this aspect are shown in Appendix 3-2, Table A3.14 and summarised in Table 9.6. The mean ratings indicate that level of agreement between the respondents with respect to the impact of IS investments on these variables.

Intermediary Variables	Mean Ratings
IS investment impact on Operational efficiency	4.38
IS investment impact on Product Delivery	4.24
IS investment impact on Customer service quality	4.00
IS investment impact on Staff	3.90

Table 9.6: Average ratings of IS impact on Intermediary variables for the sample

Closer inspection of the ratings shows that there were differences between the commercial/retail banks and the credit unions. As can be seen in Table 9.7, the commercial/retail banks in the sample rated the impact on Operational efficiency and Product delivery higher, whereas credit unions rated the impact on Customer service quality and Staff higher. These results were very consistent with the literature (Chapter 2) and observations from the cases (Chapters 7 and 8).

Intermediary Variable	Commercial/ Retail bank Means	Credit Union Means
IS investment impact on Operational efficiency	4.50	4.38
IS investment impact on Product Delivery	4.50	4.19
IS investment impact on Customer service quality	4.00	4.06
IS investment impact on Staff	4.00	3.94

Table 9.7: Comparison of mean ratings between industries in the sample

For instance, higher ratings for Operational efficiency and Product delivery for the commercial/retail banks was hardly surprising as these FIs are well known for their focus on operational efficiency and higher profit through greater product delivery (Frei, Harker and Hunter 2000; Holland and Westwood 2001; Navarrete and Pick 2002). In fact, commercial/retail banks have become a victim of their own success in this regard, as they are now perceived (rather negatively) to have a very high focus on profit at the expense of their customers (Thornhill 2003).

Credit unions on the other hand, had higher ratings on Customer service quality and staff, which appeared to be in keeping with the credit union philosophy (CUUPC 1988). Further, it may be argued that this focus on Customer service quality and on staff has enabled credit unions to differentiate themselves from, and compete successfully, with commercial/retail banks (Reynolds and Ochalla 2003).

Thus, the results obtained from the survey not only supported the existence of the set of intermediary variables, they also showed that respondents agreed that IS investments did affect these areas. Significantly, even though respondents were provided with the opportunity to identify other intermediary variables that could have been added to the above set, no other such variables were identified. This was significant in that it suggested that the set of variables identified in this research was complete, although further research may be required to establish this unequivocally.

### **9.5.6 Managerial Effectiveness**

As discussed in Chapter 4, the Managerial effectiveness component consists of five factors. Respondents were therefore asked questions to establish both the existence of these factors and the extent to which they believed these factors were important to the IS investment relationship (Appendix 3-2, Tables A3.24 – A3.28).

#### *Senior Management Commitment*

Overall responses indicated that senior management were perceived to influence IS investment decisions (rated 3.90). Similarly, respondents generally agreed that senior management did have an impact on the development of IS (3.71) and affected how well it was utilised in their organisations (3.55). Although, one would have expected these ratings to be higher, the results do suggest that respondents were aware that there were other contextual factors that could influence IS investment decisions (Seddon, Graeser and Willcocks 2002; Sohal and Ng 1998).

As can be seen in Table A3.24 (Appendix 3-2), the mean ratings for the commercial/retail banks in the sample were generally higher (4.16) when compared to those of the credit unions (3.72) thus supporting observations in the literature (Chapter 2) and the results of the Case research (Chapters 7 and 8). These results led to the conclusion that senior management commitment was indeed an important factor in the Managerial effectiveness component.

#### *Political Environment (Culture)*

Responses indicated that respondents perceived that there was general acceptance of technology in their organisation (average 3.76). Similarly, respondents also believed that organisational learning (Andreu and Ciborra 1996) with respect to IS was encouraged (3.76). Analysis also indicated that respondents were almost neutral in their responses regarding the practice of good change management with respect to IS (3.19). Conversely, analysis indicated that respondents disagreed with the perceived negative impact of internal politics on IS investment decisions (2.62), suggesting that

there was minimal negative impact from internal politics. These results were significant as they supported results from the cases that suggested that organisational culture in general, and organisational politics in particular, does influence IS investment decisions (Stacey 1993; Peppard and Ward 1999).

Closer inspection showed that there were differences in the mean ratings of the impact of the political environment factor on Managerial effectiveness with credit unions having a higher rating (3.40) and commercial/retail banks lower at 2.75 (Appendix 3-2, Table A3.27). This result was surprising as one would have expected the commercial/retails banks with their larger and more bureaucratic structures to have a higher rating of this factor (Mintzberg and Quinn 1996; Robbins 1987). However, it could be argued that credit unions were more susceptible to organisational socio-political impacts because of their community/member based nature.

### *User Satisfaction*

On average respondents rated the user satisfaction of internal (employees) and external (customers) as 3.76 and 3.70 respectively, suggesting that they tended to agree on the existence of this factor and that it did contribute to Managerial effectiveness and the management of IS investments (3.62). This was in line with the literature and earlier research which both provide ample evidence for the existence of this factor and its role in the IS investment and organisational performance relationship (DeLone and McLean 1992). In addition, a number of measures of user satisfaction as utilised by the FIs in the sample were identified. These are listed in Appendix 3-2, Tables A3.15 and A3.16.

Overall, user satisfaction with respect to IS was higher for the credit unions in the survey sample (3.81) than the commercial/retail banks (3.17) as shown in Table A3.26 (Appendix 3-2). These results were not consistent with results obtained in the Case research where commercial/retail banks exhibited a higher level of user satisfaction. However, it is possible that the greater proportion of credit unions in the sample could have influenced this result.

*Organisational Structure*

Overall responses regarding the impact of this factor suggested that this factor did affect Managerial effectiveness. Average responses indicated that respondents were almost neutral with regards whether the organisational structures were ideal (3.24). Similarly, responses were almost neutral regarding organisational structures facilitating IS management (3.10) and regarding their influence on IS decisions (3.10). These responses suggested that respondents did not perceive their current organisational structures as being conducive to IS investment and management and therefore highlighted the importance of organisational structure to Managerial effectiveness.

Analysis also indicated that this factor did not exhibit significant differences between commercial/retail banks and credit unions in the sample. Overall, the mean rating for the commercial/retail banks was 3.17 compared to 3.13 for the credit unions both of which were both close to the mean rating of 3.14 for the two industries. These results showed that the organisational structure was a factor that influenced the management of IS investment in the FIs surveyed.

*Organisational Experience with IS*

Table 9.8 summarises overall respondents' views regarding this factor and Table A3.28 (Appendix 3-2) shows the differences in ratings between the commercial/retail banks and credit unions in the sample.

The responses showed an overall rating of the organisational experience factor of 3.47. In comparison, commercial/retail banks had an overall rating of 3.9 and credit unions a rating of 3.42 respectively.

<b>Organisational Experience</b>	<b>Mean</b>
OE provides good foundation for IS management	3.52
OE provides good foundation for IS utilisation	3.14
OE leads to better IS investment decisions	3.48
OE leads to better IS performance	3.38
OE leads better organisational performance	3.81

Table 9.8: Respondents' perspectives on organisation experience

The higher rating observed in the commercial/retail banks was in keeping with observations in the Case research (Chapters 7 and 8) and the literature (Chapter 2). These results suggested that commercial/retail banks exhibited higher levels of organisational experience with respect to IS for a number of reasons including a significantly higher overall expenditure on IS and significantly higher proportions of dedicated IS staff (Horvitz and White 2000; Harker and Zenios 2000b; Berger and Mester 2000).

In summary therefore and after considering the foregoing discussions regarding the factors that make constitute Managerial effectiveness, it was concluded that the Managerial effectiveness component of the conceptual model does indeed exist and that it does influence the IS investment and organisational performance relationship. Further, the results, although preliminary, confirmed the factors that constitute this component and were consistent with the results obtained from the Case research.

### **9.5.7 Considerations for SISP**

To verify the existence of the considerations for SISP component, respondents were asked questions relating to the existence and use of formal SISP processes within their FIs.

Overall, when queried as to the existence of formal IS strategies, respondents appeared to be almost neutral (average 3.05). This result was in keeping with the fact that the sample was dominated by credit unions in which Case research had found that there tended not to be formal IS strategies (Chapter 8). Thus, results showed that in many instances, IS strategies were not separate from business strategies suggesting that IS strategy formulation processes were incorporated into corporate strategy formulation processes.

As might be expected from the foregoing, most respondents tended to agree that their current IS strategies were well aligned with their business strategies (3.62) and that that an IS strategy was necessary for effective IS investment (3.48). However, the results also showed that respondents did not agree that IS strategy formulation was a regular activity (2.90), suggesting that the corporate strategy planning process may

not be as frequent (i.e. yearly) an activity as deduced from evidence obtained from the Case research. This aspect may require further verification as it does have implications for the efficacy of resultant strategies. Despite the lack of formal SISP processes however, most respondents did, on average, tend to agree that their current IS investment strategies were effective (3.67).

Closer inspection however, showed that, on average, the factors that make up the Considerations for SISP were rated higher in the commercial/retail banks than the credit unions. These results were consistent with, and supported, observations in the Case research regarding the presence and hence the influence of the Considerations for SISP component in the conceptual model. Table 9.9 shows the comparison of the means between the responses from the two industries in the sample.

Factors	Commercial/Retail Banks	Credit Unions
Definition of IS	3.5	3.06
Tracking of IS investment	4	3.13
Factors influencing IS decisions	3.5	3.38
Originators of IS initiatives	3	3.06
Calculation of return on IS investment	4	3.19
Alignment of IS investment with CS goals	4.5	3.88
IS investment for competitive advantage	4.5	3.63
Effective/efficient utilisation of IS resources	4.5	3.69
Development of policies for IS	3.5	3.19

Table 9.9: Comparison of means between commercial/retail banks and credit unions

Clearly, the considerations for SISP component is important to the IS investment and organisational relationship as depicted as by the conceptual model. Further, the literature provides substantial support for the need to have SISP in organisations if they are to fully realise the benefits of IS investments (Ward and Peppard 2002; Pearlson and Saunders 2004).

### **9.5.8 Context (Environment)**

Table 9.10 summarises the overall means for responses regarding the influence and impact of contextual factors on the IS investments.



Context	Mean Ratings
Environment highly competitive	3.86
IS investments used for competitive advantage	3.33
IS provides opportunities for collaboration	3.86
Stakeholders influence FI's IS investment decisions	3.62
Environment influences IS decisions	3.24
Environment is highly regulated	3.62
Regulatory framework influences IS decisions	4.14
Regulatory framework influences IS decisions	3.95
Mandatory IS investments result from regulation	3.76

Table 9.10: Influence and impact of Context on IS investment and organisational performance relationship

Researchers have long questioned the influence of an organisation's environment on IS investment (Li and Ye 1999). However, in much of the literature, the impact of context on the IS investment and organisational performance relationship may not be fully investigated leading to a situation wherein the true extent of its impact may not be fully understood. Consequently, this research, has attempted to investigate this issue in the development of the conceptual model.

The results clearly show that respondents do believe that context is an important issue whose impact on an organisation needs to be carefully considered with respect to the IS investment and organisational performance relationship. Thus, it may be concluded that the survey results, although tentative, support the findings of the Case research regarding the impact of context. Analysis indicated that the results suggested two main issues in the environment of FIs that influence IS investments, competition and regulation.

As can be seen from the results in Table 9.10, respondents agreed that the FSS was highly competitive and that IS investments were used for competitive advantage. This result provides support for the application of RBV theory in the development of the conceptual model (Bharadwaj 2000; Lopez 2001). Despite the foregoing, it was not surprising that most respondents agreed on the possibility of IS investments being used for collaboration, given the fact that the sample was dominated by credit unions who, by nature, tend to collaborate on many aspects of their Information Technology through CUSCAL (Chapter 2). The results also supported the application of Stakeholder theory and showed that stakeholders do have a role to play

in the IS investment and organisational performance relationship (Freeman 1984; Jurison 1996).

With regards to regulation, it was evident that respondents agreed that the FSS was and continues to be regulated and that the regulatory framework could affect IS investment decisions resulting in mandatory IS investment (Horvitz and White 2000).

Contextual Factors	FI types	
	Commercial/Retail bank means	Credit Unions means
Environment highly competitive	3.50	3.94
IS investments used for competitive advantage	3.00	3.44
IS provides opportunities for collaboration	4.00	3.88
Stakeholders influence organisation's IS investment decisions	4.00	3.75
Environment influences IS decisions	3.50	3.25
Environment is highly regulated	4.00	3.75
Regulatory framework influences IS decisions	4.00	4.13
Regulatory framework influences IS decisions	4.00	3.88
Mandatory IS investments result from regulation	4.00	3.63
Overall	3.78	3.74

Table 9.11: Comparison of means between commercial/retail banks and credit unions regarding influence of contextual factors

Table 9.11 compares the mean responses between commercial/retail banks and credit unions in the sample. As can be seen in Table 9.11, the responses indicated that, although there were differences in the mean ratings of the individual contextual factors, the overall mean ratings only showed a slight difference between the commercial/retail banks and the credit unions (3.78 vs 3.74).

These results show that both industries were almost equally affected by the contextual factors within the Australian FSS. This observation was consistent with the results of the Case research (Chapters 7 and 8) and with observations in the literature (Chapters 2 and 3).

## **9.6 Refinement of Conceptual Models**

This exploratory research sought to explain the relationship between IS investment and organisational performance in FIs within the Australian FSS. To achieve this objective a conceptual model was proposed that was grounded in the literature (Chapter 2). Thus, data from two industries within the FSS were collected, analysed and applied to the conceptual model. The results obtained within each industry were consistent and confirmed the existence of the components of the conceptual model.

Further, the results suggested that there were perceptible differences in the IS investment and organisational performance relationship between the two industries. These differences resulted in the derivation of two similar, yet different models of the relationship as shown in Figures 7.7 (commercial/retail bank extended model) and Figure 8.7 (credit union extended model) in Chapters 7 and 8 respectively. Thus, the survey reported in this chapter tested and confirmed the results from the Case research and the resultant models.

## **9.7 Conclusions**

The survey set out to verify and test the components of the conceptual model in the Australian FSS. It should however be emphasised that the survey was of a preliminary nature and that the conclusions drawn thereof were consequently tentative. However, it was also noted that the survey was a vehicle for the testing and refinement of the model in its initial stage of development.

The survey results supported observations from the literature review, meta-analysis and cases leading to the following conclusions:

1. The existence of the components of the conceptual model and their individual factors as discussed in Sections 9.5.3 to 9.5.7 was confirmed.
2. The concept of an IS investment threshold was confirmed and the value of this threshold for the FIs in the sample quantified (Section 9.5.3).
3. The results confirmed the existence of the set of intermediary variables in the IS investment and organisational performance relationship (Section 9.5.5).

4. The results showed that contextual factors, including competition and regulation do impact the IS investment and organisational performance relationship by influencing the types of IS investments made by FIs (Section 9.5.8).

In addition, analysis of the results supported the integration of both RBV and Stakeholder theories in the development of the conceptual model (Idris et al. 2003). Although there were differences observed in the data received from the commercial/retail banks and credit unions in the survey sample, the differences were largely consistent with the results from the Case research and thus spoke to the reliability and validity of the research instrument.

These results were clearly encouraging and do suggest that the conceptual model may be extended and generalised to a larger population of FIs, however further research is recommended in this regard.

## **9.8 Survey Limitations**

The results of the survey supported the results obtained via Case research. However, there were two major limitations noted of the survey. The first limitation observed in this survey was the relatively low response rate. It is an acknowledged fact that surveys, particularly mail-based surveys are susceptible to low response rates and this survey was no exception (Neuman 2000). Further, as alluded to in section 9.5.1, the relatively low response was symptomatic of the difficulties of conducting research in the FSS initially observed during the Case research. Consequently, the research design included tactics designed to minimise this limitation (Chapter 6). However, given the exploratory nature of this research, the data set was considered adequate for preliminary testing of the conceptual model and for triangulation (convergence) with the Case research findings and the literature.

Second, the testing was of a preliminary nature (as has been highlighted throughout the discussions in this chapter) and was therefore only designed to verify the existence of the individual components of the conceptual, the existence of the intermediary variables and obtain respondents' perceptions regarding the IS

investment and organisational performance relationship. Thus only limited analyses, in the form of descriptive statistical analyses, were performed (Section 9.5). However, the results were of sufficient quality that they enabled the successful conduct of the analysis leading to the attainment of the overall objective of testing the conceptual model.

Despite these limitations, the survey utilised stringent guidelines to ensure quality in the research. Further research is therefore recommended in future to further test and strengthen the conceptual model.

## **9.9 Chapter Summary**

The research design incorporated the use of both case and survey research methods. Chapters 7 and 8 presented the results from the Case research and this chapter presented the results of the survey.

The objectives of the survey were: 1) To provide preliminary testing of the conceptual model and thus provide a basis for comparative/confirmatory analysis with the Case research results, 2) To refine the conceptual model and 3) To demonstrate the generalisability and suitability of the conceptual model by extending the research beyond the case sample.

The results of the survey clearly supported the findings from the cases and confirmed both, the existence of the components of the conceptual model and their constituent variables. In addition, the survey also confirmed the set of intermediary variables as observed in the extended conceptual models derived from the cases.

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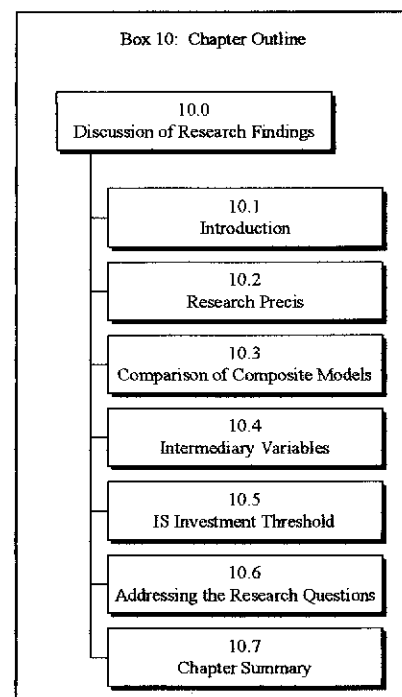
# 10.0 Discussion of Research Findings

## Findings

### 10.1 Introduction

This chapter presents the discussion of the research findings from the cases and the survey with the specific aim of demonstrating how the primary research question and its attendant secondary research questions were addressed through the deliberate application of the base theories and the literature by way of a structured research design. To achieve this, the discussion covers the following areas:

1. A meticulous comparison of the composite extended conceptual models.
2. A thorough discussion of the emergent set of intermediary variables.
3. A comprehensive review of the implications of the concept of an IS investment threshold.
4. A detailed discussion of the relevance and impact of context.
5. A detailed review of the propositions and the answering of the research questions.



The above discussions are important in that they demonstrate the enfolding of the conceptual model with the literature and in so doing further demonstrate the strength of the conceptual model.

Section 10.2 presents a short précis of the research. This synopsis further emphasises the importance and significance of the research, the strengths of the research design and its attendant methods.

Section 10.3 presents a comparative analysis of the composite extended models derived from research in the credit union and commercial/retail bank industries of the FSS. This analysis comprises the 'cross-industry' analysis specified in the research design.

Section 10.4 extends the discussion by focussing specifically on the intermediary variables that have emerged from this research. Each emergent variable is individually analysed and in addition, the perceived interrelationships between these variables are explored. Further, the influence of these variables upon the IS investment and organisational performance relationship is explored in detail.

Section 10.5 discusses the concept and implications of the IS investment threshold. This discussion further expounds on the utility of this concept in determining the level of investment as represented by the IT portfolio within the context of the research findings.

Finally, the discussion reviews the research questions and the attendant propositions (Section 10.6) to demonstrate how the conceptual model addresses these important questions and thus explains the IS investment and organisational performance relationship. The chapter concludes with a brief summary of the preceding discussions.

## **10.2 Research Précis**

The research in presented in this thesis was undertaken to answer a fundamental question regarding the relationship between IS investment and organisational performance:

1. How are IS investments and organisational performance related in Financial Institutions?

In addition, four secondary questions were put forward:

2. Do some components of a FI's IT portfolio contribute more to organisational performance than others and if so, how?

3. How does the role of management affect the IS investment and organisational performance relationship?
4. How does organisational performance affect IS investment levels?
5. Is there a 'threshold' for the level of investment in IS/IT for FIs?

To achieve this, a conceptual model was proposed that was not only intuitively simple, but was thoroughly grounded in the literature (Chapters 2, 3 and 4). This conceptual model was a combined process and variance model (Seddon 1997) that had four main components: the level of IS investment, organisational performance, considerations for SISP and Managerial effectiveness (Chapter 4). In addition, the effect of context was explicitly incorporated into the research as this is an issue that has been acknowledged to have a significant influence the IS investment and organisational performance relationship.

In order to conduct the research, a three-phase research design was developed that consisted of: 1) Model definition, 2) Model development and testing and 3) Model refinement. Given the apparent lack of theory in this field of research and the need to better understand the effects of context, this research was designed as an exploratory research project with the Case research method being selected as the most appropriate method to develop the model in phase 2. In addition, the survey method was chosen as the most appropriate method to perform the preliminary testing (and thus refine the model) subsequent to the development/testing of the model (phase 2). Thus, the research design incorporated both model development/testing and model refinement activities based on a robust, reliable and valid framework that utilised recommendations and guidelines from prior research (Chapter 6).

As part of the research design, a comprehensive case study protocol was developed for the execution of Case research. The case study protocol contained, inter alia: a) detailed guidelines to assist the researcher in the conduct of each case study, b) the Case research instrument, c) definitions and descriptions of the types of data that would be collected (Secondary data schema) and c) detailed guidelines for analysing collected data.

To facilitate the development of the conceptual model through Case research, five propositions, relating to each of the components of the conceptual model, were put



forward that would be examined during the course of the research project to validate the components of the conceptual model. As shall be demonstrated later, the results obtained strongly supported these propositions and therefore demonstrated unequivocally that the research questions had been answered. Hence, it may be concluded that this research was able to achieve its primary objective of developing a conceptual model that could assist both IS professionals and academics to better understand the relationship between IS investment and organisational performance.

The next section discusses and compares the composite extended models derived for two industries in the Australian FSS in which the Case research was conducted.

### **10.3 Comparison of Composite Extended Models**

An extended conceptual model was derived for each case after the application of the case study protocol and research instrument. The extended conceptual models clearly showed that IS investments do influence organisational performance and that this relationship was positive but indirect and moderated by a set of intermediary variables (Chapters 7 and 8). These results were significant as they supported deductions made from the meta-analysis (Chapter 3) on the nature of this relationship.

Subsequent to that, the extended composite models for the credit union cases and those for commercial/retail bank cases were combined to derive a composite extended model for each industry (Chapters 7 and 8).

The results obtained from the Case research indicated that the composite extended conceptual models derived were similar and had the following notable characteristics:

1. Both composite models displayed all of the original components, with the exception of the considerations for SISP component that was absent in all but one of the credit unions.

2. In both composite models, a set of intermediary variables was derived that defined areas upon which IS investment appears to have the most impact and through which is consequently influences organisational performance.

Table 10.1 provides a comparison of the extended composite models and thus highlights the differences between the commercial/retail bank and the credit union industry models.

Conceptual Model Component	Credit Unions	Commercial/Retail Banks
Level of IS investment (IT Portfolio)	Present	Present
Organisational Performance	Present	Present
Considerations for SISP	Not Present*	Present
Managerial Effectiveness	Present	Present
Staff	Present	Present
Product Delivery	Present	Present
Operations	Present	Present
Customer Service Quality	Present	Present

Table 10.1: Comparisons of composite extended conceptual models

*\*With the exception of one credit union in the case sample that had only recently embarked upon SISP*

With respect to the IS investment component, results in all cases showed that the IT portfolio was an appropriate representation of IS investments (Weill 1992). As may be expected the actual structure and content of the various portfolios will differ and vary by organisation in keeping with Resource Based View theory (Bharadwaj 2000). For example, the IT portfolios displayed significant differences in the commercial/retail bank industry, whereas those in the credit union industry were more similar, particularly relating to TPS. These similarities/differences were highlighted in the discussions in Chapters 7 and 8. Significantly, the survey went further and enabled the identification of key IS management ratios which could be utilised in future research to quantify IS investment and thus enable it to be linked to organisational performance more consistently. The identified IS management ratios were: 1) IT expense/Total Assets, 2) IT expense budget (Total IT expenditure), 3) Fixed Software maintenance costs and 4) Software development project costs and were consistent with earlier studies such as Cron and Sobol (1983) and Harris and Katz (1989).

The most notable difference between the derived composite extended models for the two industries was the fact that the considerations for SISP component was absent from the credit union model. The presence of this component in the commercial/retail banks model clearly demonstrated that undertaking SISP does influence the structure and type of the IT portfolio, as individual commercial/retail banks FIs sought to differentiate themselves through their IS investments (Mckeen and Smith 1993b; Lopez 2001). It should be emphasised at this juncture that the effectiveness of SISP is enhanced if implemented in concert with and aligned to a comprehensive corporate strategy (Henderson and Venkatraman 1993). The role of the considerations for SISP was further highlighted in one of the credit union cases (CUC3) that had recently undertaken the development and implementation of an IS strategy. As a result, observations in CUC3 showed that it had began a process of enhancing its IT portfolio by implementing changes that may otherwise not have been considered in the absence of a formalised IS strategy (Robson 1997).

The presence of the considerations for SISP component was further explored in the survey that revealed that there were differences in the perceived impact of the factors that constitute this component in the FSS in Australia. Significantly, the results of the survey showed that the commercial/retail banks consistently rated these factors higher (Table 9.9) and thus supported the findings of the Case research (Chapters 7 and 8).

Another important feature of the conceptual model was the organisational performance component. The conceptual model suggested that this component had two aspects, an internal and an external aspect, each consisting of a variety of KPIs. The survey facilitated the identification of a total of 26 internal KPIs and 28 external KPIs (Table 9.3) that were consistent with the observations in the meta-analysis (Chapter 3). Further, the survey also revealed that although the FIs in the Australian FSS utilised similar KPIs although the set of most commonly cited KPIs did vary by industry in keeping with Stakeholder theory (Freeman 1984; D'Souza and Williams 2000). Tables 9.4 and 9.5 clearly show these differences.

Thus, it was deduced that the KPIs actually used by each FI were not only determined by the reporting requirements of the regulating authority (APRA 2003) and but also by the stakeholders to whom each FI had an obligation to provide

information about its performance (Donaldson and Preston 1995). As discussed in Chapter 2, recent changes in the Australian FSS resulted in all Authorised Deposit-taking Institutions (ADIs)s having to conform to the same compliance requirements (Wallis et al. 1997). Finally, the survey showed that there appeared to be more consistency in the application of KPIs amongst the commercial/retail banks compared to the credit unions in the sample (Chapter 9, Section 9.5.4). Significantly, there did not appear to be any mechanisms for relating IS investments to performance, and it is anticipated the key IS management ratios identified in the preliminary testing (Chapter 9) could be utilised in this regard in future research.

The Managerial effectiveness component was also confirmed to exist in the individual models and in the extended composite models (Chapter 7 and 8). In addition, the Case research was able to verify the actual factors that make up the Managerial effectiveness component and showed that these factors had a medium to high impact on the IS investment and organisational performance relationship. Further, the testing of the conceptual model via survey provided results that supported the Case research results. As was expected, there were some differences observed in the ratings of the individual factors that constitute the Managerial effectiveness component (Chapter 9, Section 9.5.6). Analysis revealed that both credit unions and commercial/retail banks considered the factors that constitute the Managerial effectiveness component to be important to the IS investment and organisational performance relationship. This last observation therefore provided unequivocal support for the role and importance of management (particularly senior management) in the IS investment and organisational performance relationship.

Similarly, in each of the individual extended conceptual models, the same set of intermediary variables was observed to be present (Chapter 7, 8 and 9). Observations indicated that the level of emphasis by each FI on the individual variables in this set was varied and determined to a greater or lesser extent by their individual corporate strategies (Preece 1995; Dewan, Michael and Min 1998; Croteau and Bergeron 2001). The intermediary variables are discussed in more detail in Section 10.4.

In summary therefore, it can be deduced that the conceptual model was found to be practical, suitable and appropriate in explaining the relationship between IS investment and organisational performance. Further, observations indicated that

differences in industry and other contextual factors contributed to differences observed in the extended composite models and provided unqualified support for the deliberate inclusion of an investigation into context within the research design. Lastly, the consistency of results obtained bore testament to the reliability of the case study protocol and the instruments used to conduct both the Case studies and the Survey.

#### **10.4 Intermediary Variables**

Using qualitative analytical techniques, a set of four intermediary variables was deduced, via Case research, that was deemed to influence the IS investment and organisational performance relationship. This set of intermediary variables (operational efficiency, staff, product delivery and customer service quality) was further confirmed in the results obtained via the survey. The presence of the intermediary variables therefore suggests that IS investments affect organisational performance by influencing changes in these variables that then contribute to improved organisational performance.

The results of the survey showed that the mean ratings of the intermediary variables were medium to high for the sample (ranging from 3.98 to 4.38). However, the results of the survey also showed that there were differences in the mean ratings between commercial/retail banks (ranging from 4.00 to 4.50) and the credit unions (ranging 3.94 to 4.38) as shown in Table 9.8.

A review of the literature in both the IS (Mahmood and Mann 1993; Mahmood 1994; van Nievelt 1999) and banking fields (Parasuraman, Zeithaml and Berry 1985; Krishnan et al. 1999; Berger and Mester 2000; Holland and Westwood 2001) confirmed that there is substantial support for these variables. Many researchers have attempted to explain the impact of these variables on organisational performance either singly or in concert with other variables (Leibenstein 1980; Ghobadian, Speller and Jones 1994; Robledo 2001).

The results and analysis from this research therefore supports and build on this early. Further, the results from this research suggest that these variables may not exist in

isolation and that there may be some interaction between the variables. Closer analysis of the set of intermediary variables and comparison with the literature suggests that there is indeed a degree of overlap between these variables. Evidence of these interactions has been discussed in the context of a number of general management models (ten Have et al. 2003) and in specific models such as the Operational capabilities–Service Quality–Performance (C-SQ-P) triad (Krishnan et al. 1999; Duncan and Elliot 2002) and Operational efficiency (X-efficiency) models (Parasuraman, Zeithaml and Berry 1985; Cronin and Taylor 1992; Teas 1993).

Closer inspection of the variables suggested that these variables might further be categorised as being internal (Operational efficiency and Staff) and external (Product delivery and Customer service quality) to the FI. Clearly, the focus and emphasis given to each variable by the individual FIs will depend on their individual corporate strategies (Galliers and Baker 1994). Figure 10.1 illustrates the set of intermediary variables and their possible interactions.

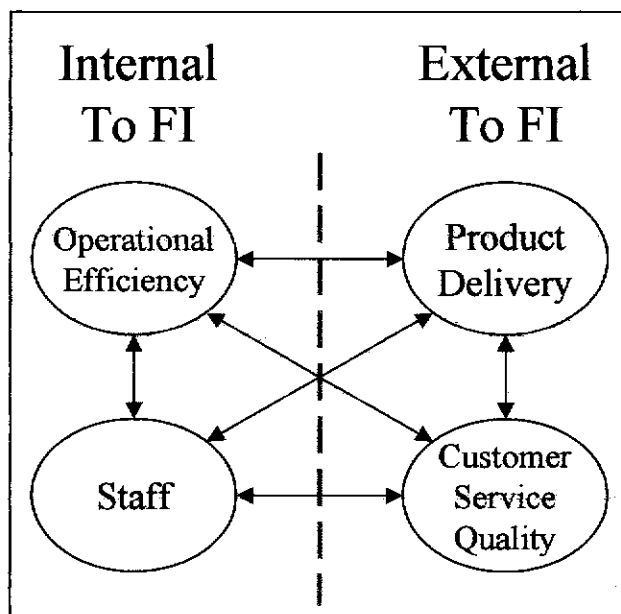


Figure 10.1: Intermediary variables influencing the IS investment and organisational performance relationship

The following sub-sections (10.4.1 to 10.4.4) will now address each of the intermediary variables in turn to explain what constitutes each variable, its role in the extended conceptual model and thus demonstrate how both Case research and Survey were able to elucidate these variables in the IS investment and organisational performance relationship.

### **10.4.1 Staff**

At a general level, two categories of staff exist, managerial and non-managerial staff, with the specific types of staff present in an organisation being dependant on the organisation's functional structure (Wood et al. 2004).

The staff component is perhaps the most complex of the four intermediary variables in that – not only does it stand on its own, it can also be a factor in the other variables, for example Customer service quality variable. Thus, it can be seen that one of the dimensions of customer service quality (empathy) as proposed in the SERVQUAL instrument attempts to describe the role that staff might play in an organisation (Parasuraman, Zeithaml and Berry 1988).

In addition, it is paradoxical that organisations in general have used investments in IS as a substitute for capital and labour (Staff) in their quest for improvements in efficiency (Chapter 2), yet many FIs, including those in the sample, claim that their staff constitute one of their most important assets (Chapters 7 and 8).

To elaborate, observations in the FIs that participated in the Case research showed that FIs tended to structure their activities into two functional areas, front office and back office, whose roles have evolved over time (Frei, Harker and Hunter 2000; Berger and Mester 2000). Back office functions focus primarily on processing, which used to be very manual and labour intensive, but have now become more automated (Font 1993). Front office functions on the other hand have evolved from being simply clerical functions to an emphasis on sales and service (Font 1993). Arguably, IS investments have played a role in this evolution, and at times may even be perceived to have been the catalyst for some of the changes (Harker and Zenios 2000a).

The foregoing business model has been adopted widely in FIs and has resulted in larger proportions of investment being directed at IS investments compared to staff (Font 1993). Despite this however, it may be concluded that FIs do allocate large parts of their expenditure to staff training to ensure that staff are provided with the requisite skills so that they can cope with evolving nature of their jobs (Harker and Zenios 2000a). Clearly the staff variable does influence (and is influenced by) the IS investment and organisational performance relationship.

## **10.4.2 Product Delivery**

It is arguable that product delivery is one of the areas of a FI that has been (and continues to be) most significantly impacted by advances in IT (Holland and Westwood 2001). In the traditional banking model, the so-called 'bricks and mortar' model, FIs relied extensively on their network of PORs which in effect constituted a significant competitive advantage against existing rivals and an entry barrier for new entrants (Joseph and Stone 2003). However, affordable technology has in effect levelled the playing field, reduced this competitive edge and lowered entry barriers within the FSS (Yakhlef 2001). Consequently, IT has significantly alleviated the need for extensive POR networks by providing alternative delivery channels to customers as was aptly demonstrated in one of the credit union cases, CUC1, to the extent that virtual or Internet banks now exist that do not necessarily require a network of branches, the so-called 'clicks and mortar' model (Kiesnoski 1999).

In addition to the direct use of technology in a variety of channels, IT also provides processing and telecommunications capabilities that further enhance a FIs ability to handle high volumes of transactions arising from complex customer relationships (Font 1993). Furthermore, the use of technology has enabled FIs to lower operating costs by implementing self-service, direct banking models in which customers interact with their FIs without requiring human intervention or the need to visit a POR (Harker and Zenios 2000a). This last characteristic has a downside however, in that it has led to claims (and complaints) by customers of the growing detachment and impersonality of FIs, particularly commercial/retail banks, as they appear to focus solely on improving their bottom lines at the expense of customer service (Thornhill 2003).

Thus, according to Llewellyn (1996) technology presents as both an opportunity and a threat in enabling FIs to deliver existing services to be more efficiently and facilitating the provision of new and innovative services. In addition, the increased variety of product delivery channels now available implies that customers now have a choice in the mode(s) with which they interact with their FI (Prasad and Harker 1997; Hunter and Hitt 1997). Conversely, this enables FIs to package, price and present a variety of product/service sets, defined by their marketing strategies, as they compete with each other for a greater share of the customer's wallet.



Figure 10.2 summarises and illustrates some of the current and future technology based product delivery channels.

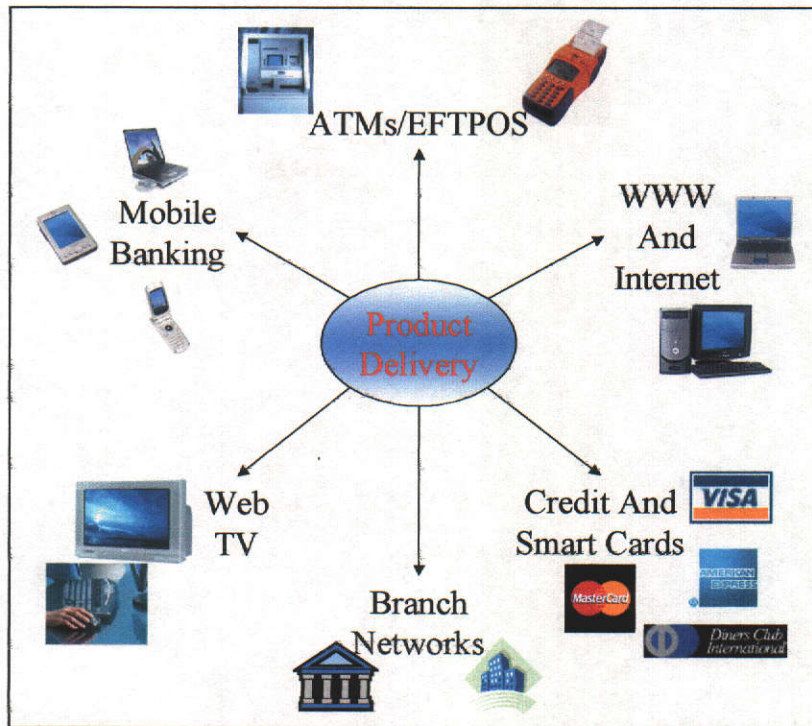


Figure 10.2: Current and future product delivery channels

Briefly:

1. Mobile commerce (m-commerce) – enables customers to interact with their FI via mobile communication devices such as Personal Digital Assistants and mobile phones (Shih and Shim 2002).
2. Automated Teller Machines (ATMs) – provide an alternative channel to the POR (branch/agency) network through which customers can perform a variety of transactions such as cash withdrawal and deposits (Daniel 1999).
3. Electronic Funds Transfer/Point of Sale (EFT/POS) – enables customers to perform cashless purchases in retail outlets. These transactions debit the customers accounts immediately and are treated as cash transactions (Prendergast 1993).
4. Internet banking – enables customers to perform a broad range of financial transactions on the World Wide Web, including, bill payments, inter-account transfers and reviewing of account transactions (Birch and Young 1997).

5. Credit cards and smart cards – Similar to EFT/POS, credit cards enable customers to perform cashless purchases. However, credit cards are different from EFT/POS in that the transactions are a form of credit (Mills 2002).
6. Web-TV – represents the convergence of two popular media, the television and the World Wide Web (Birch and Young 1997; Jayawardhena and Foley 2000).

It is evident that the range of product delivery channels available to any FI will have a significant effect on its ability to compete in the FSS (Birch and Young 1997). It is pertinent to note that despite the widespread acceptance of technology-based product delivery channels FIs still need to be aware of the fact that some customers still value traditional face-to-face contact with their FIs (Durkin et al. 2003). Hence, achieving the right mix of delivery channels is perhaps just as important as the selection of the technology.

Thus, the emergence of this variable in the conceptual model lends further (strong) support to the conceptual model and its ability to explain the relationship between IS investment and organisational performance.

### **10.4.3 Operational Efficiency**

According to Berger and Mester (2000), there has been substantial research into understanding the determinants of operational efficiency in FIs. Generally, the literature on efficiency is divided into two approaches, an intermediation approach and a production approach.

Models based on the intermediation approach are typically cost based models in which various costs constitute inputs that are combined to maintain as high a number of revenue generating accounts as possible. Thus Berger and Mester (2000), identified three alternative models of efficiency:

1. Cost efficiency – measures and benchmarks a FI's cost to best practice.
2. Standard profit efficiency – measures a FI's ability to produce the maximum profit, with a given level of input/output prices

3. Alternative profit efficiency – measure the maximum profit that may be earned for a given level of output as opposed to output prices.

Production models on the other hand utilise the basic Input-Process-Output (IPO) model, essentially derived from General Systems Theory, as a basis for measuring efficiency (Figure 10.3). Thus, inputs are represented by a set of resources including Staff (managerial and clerical), IT and premises. It is arguable that such models are more consistent with RBV theory as discussed in Chapter 2 and are therefore more consistent with this research.

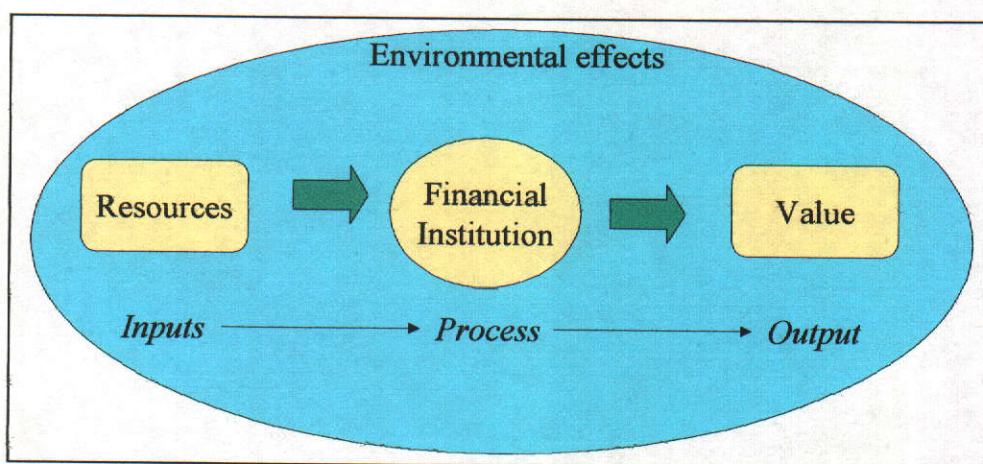


Figure 10.3: Typical IPO model for a FI (adapted (Zenios et al. 1999))

In the literature on the performance of FIs, operational efficiency is alternatively referred to as 'X-efficiency'. Leibenstein (1966) and Leibenstein (1980) introduced and extended the concept of X-efficiency as a measure of how well management in FIs utilises all available resources at their disposal to generate value. Therefore, X-efficiency describes all technical and allocative efficiencies that are not dependent on economies of scale or scope (Harker and Zenios 2000b).

Thus, operational efficiency is clearly a determinant of organisational performance. In fact, Berger and Mester (2000) argued that differentials in efficiency between FIs could be large and therefore contribute significantly to differences in organisational performance between FIs, *even when FIs are operating under the same conditions*. This argument was clearly supported by evidence from research, particularly the survey (Chapter 9, Section 9.5.5) that clearly showed that the differences in the importance of this variable across the FSS.

The emergence of the Operational efficiency (X-efficiency) intermediary variable out of the results of this research provides strong support for the extended conceptual model's ability to explain the IS investment and organisational performance relationship in FIs.

#### **10.4.4 Customer Service Quality**

Research on and interest in customer service quality has grown rapidly with the acknowledgement of the association between customer service and organisational performance (Duncan and Elliot 2002). Although there has been extensive research in the area of customer service quality, the definition of what constitutes Customer service quality remains elusive and debatable. According to Robledo (2001), there are two distinctly competing paradigms:

1. The disconfirmation paradigm – where customers evaluate the service received based on the gap between their perceptions and expectations. Parasuraman, Zeithaml and Berry's (1985) SERVQUAL model is based on this paradigm.
2. The perceptions paradigm – in which expectations are deemed irrelevant and that perceptions are the only measure required when evaluating the level of quality. Cronin and Taylor's (1992) SERVPERF model and Teas' (1993) EP model are examples of models in this paradigm.

Despite criticisms levelled against it, SERVQUAL remains the most widely used model. Further, one of the credit unions in the sample, CUC3, reported that it had been utilising the SERVQUAL instrument consistently for a number of years. Similarly, Johnston (1997) also utilised an extended version of SERVQUAL in the study of the determinants of customer service quality in FIs in the United Kingdom.

In the SERVQUAL model, Parasuraman, Zeithaml and Berry (1985) identified ten determinants of service quality (access, reliability, communication, understanding, credibility, courtesy, security, competence, tangibles and responsiveness) that reduce into five consolidated dimensions (reliability, assurance, responsiveness, tangibles

and empathy). These five dimensions may be associated with IS investments as follows:

1. Reliability – dependability and accuracy of services provided by IS investments.
2. Assurance – belief in the IS investments' ability to provide secure services.
3. Responsiveness – ability of IS investments to provide prompt and efficient service.
4. Tangibles – physical appearance and aesthetics of facilities and equipment.
5. Empathy – accessibility/approachability of support systems such as help desks.

Clearly, the five dimensions do impact on the relationship between IS investment and organisational performance and there is sufficient evidence in the literature proving that each of these dimensions has been considered a contributing factor to the effectiveness/efficiency of IS investments (Pitt, Watson and Kavan 1995). In addition, it is arguable that the quality of service will differ between FIs depending on their individual emphasis on each of the five dimensions which may in turn be related to, or even determined by, corporate and IS strategies.

Duncan and Elliot (2002) explored the contribution of customer service quality to profitability in the Australian FSS and noted that this factor played an important role in the profitability of FIs. In addition, Duncan and Elliot (2002) also observed that commercial/retail banks were stronger operationally, whilst credit unions had higher levels of customer service. This observation was consistent with observations made in this research, both in the Case research (Chapters 7 and 8) and the subsequent Survey (Chapter 9). Most significantly, the general perception that credit unions exhibit higher levels of customer service quality than commercial retail banks (Reynolds and Ochalla 2003) was confirmed in the results of the survey (Chapter 9, Table 9.7).

## **10.5 IS Investment Threshold**

The results from the Case research (Chapters 7 and 8) provided useful insights into the practicality, applicability and suitability of the concept of an IS investment threshold, especially in light of the fact that there has been little prior research on this topic (Chapter 2). Questions regarding the existence and use of an IS investment threshold in the IS investment decision-making process elicited mixed responses. Observations revealed that, in the main, participants were not aware of the concept of an IS investment threshold, nor did they use anything similar to this concept in the management of their IS investments. However, it was clear that when presented with this concept and an explanation as to its use, participants responded positively to and indicated that they saw the potential benefit of utilising this concept in the management of IS investments.

Thus, analysis of responses from participants in the Case research indicated that the concept of an IS investment threshold was dichotomous. On the one hand, an IS investment threshold may be perceived to an *enabler* when utilised by FIs to justify/increase IS investment levels based on benchmarking against best practice or competitors. Conversely, the IS investment threshold may also be a *limiter* when utilised by FIs to control/reduce IS expenditure levels, again based on benchmarking against best practice or competitors within their respective industries and across the FSS.

Further, collation of respondents' perceptions and analysis of data supplied (both commercial/retail banks and credit unions) indicated that IS investment thresholds ranged between 10% and 20% in the five-year period from 1997 to 2001. Out of the six cases, only once case (CUC2) had an IS investment threshold lower than 10%.

The results of the survey were similar to those obtained in the Case research and thus provided strong support for the use and application of the concept of an IS investment threshold within the FSS. Table 9.2 shows the actual IS investment thresholds for both the commercial/retail banks and the credit unions in the sample. As may be expected there were differences in the values of the thresholds between the two industries, 7.50% for commercial/retail banks and 16.55% for credit unions. It was surmised that the commercial/retail exhibited a lower threshold due to their

stronger cost management regimes that have seen commercial/retail banks reduce their overall cost to income ratios to levels at or below 50% (APRA 2003).

These results led to the conclusion that there was consistency in the IS investment thresholds for both commercial/retail banks and credit unions and therefore supported the use and applicability of this concept to the management of IS investments in the FSS. Thus, the concept of an IS investment threshold is one that has strong potential in assisting management to make the most appropriate decisions regarding the level of IS investment (Bender 1986). This in turn would have a direct influence on the relationship between IS investment and organisational performance as described by the extended conceptual models.

Having discussed and compared the composite extended models and the intermediary variables, the discussion of the results now turns to the major components of the conceptual model with the aim of demonstrating how the research questions and propositions were addressed by this research.

## **10.6 Addressing the Research Questions and Propositions**

To address the problem of developing a better understanding the relationship between IS investment and organisational performance, this research utilised both case and survey research based on guidelines by Eisenhardt (1989), Yin (1994) and Miles and Huberman (1994). The recommendations included the development of a comprehensive research design that incorporated the five components of a practical research design (Yin 1994)<sup>15</sup>:

1. The research questions which upon which the study is based
2. The study's propositions (derived from the research questions)
3. The study's unit(s) of analysis
4. The logic that links data and propositions

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<sup>15</sup> Refer to Chapter 6 for a comprehensive discussion of the Research Design.

## 5. Criteria for interpretation of the research findings

Consequently, a set of research questions and propositions were put forward based on the conceptual model which were aimed at resolving the research problem. In addition, the research sought to extend the existing body of knowledge in this field of research (Chapter 2 and 3).

Before addressing the research questions, it is important to demonstrate how the propositions that arose from these research questions gave rise to the components of the conceptual model and hence facilitated the answering of the research questions (Yin 1994).

### 10.6.1 Proposition 1 – IS investment

*An organisation's IS investments contribute positively to its performance. The level of IS investment is best described by the organisation's IT portfolio, which comprises of Infrastructure, Core (Transaction) Processing Systems and Management Information Systems/Decision Support Systems.*

Research showed that this proposition was supported. It was evident that all the FIs in the sample, irrespective of size, have made significant IS expenditures over the years with the express intention of improving their organisational performance. Utilising Resource Based View of the firm theory (Barney 1991; Bharadwaj 2000; Lopez 2001), this research established that IS investments are not homogenous and this heterogeneity was reflected in the individual IT portfolios of each FI. Thus, observation and analysis showed that no two FIs had exactly the same systems in their IT portfolio, even when there were significant similarities in the nature and structure of the FIs consistent with the principles of the Resource Based View (Barney 1991; Barney 1997).

It was found that categorising the systems in the IT portfolio as Infrastructure, TPS and MIS/DSS was a very practical mechanism that respondents agreed could be useful in the management and decision making processes regarding the level of IS investment. Further, the survey enabled the identification of key management ratios that could be utilised to quantify these IS investments in future research (Chapter 9).



Observations and analysis further showed that the TPS component was considered to contribute the most to organisational performance followed by MIS/DSS and infrastructure. These observations were consistent in both credit unions and commercial/retail banks (Chapters 7, 8 and 9).

### **10.6.2 Proposition 2 – Organisational performance**

*An organisation's performance can be described both by:*

- a) External indicators (Key Performance Indicators) acceptable at an industry level. These measures may form a basis for comparison with other organisations competing in the same sector*
- b) Internal indicators (Key Performance Indicators) that may be unique to that organisation. Management use these standards to determine performance at various levels (individual, group or entire organisation).*

The conceptual model identified two aspects of organisational performance, internal and external and this research confirmed that IS investments do impact upon both aspects. This supposition was further supported and corroborated by the emergence of a set of intermediary variables that also exhibited the internal/external dichotomy (Figure 10.1).

To better explain the IS investment and organisational performance relationship, the research attempted to identify those KPIs that may best be utilised to demonstrate the impact of IS investments. Applying Stakeholder theory confirmed that the actual measures used were very much dependent on the information requirements of stakeholders, be they internal or external to the FI (Donaldson and Preston 1995; Key 1999; D'Souza and Williams 2000; Idris et al. 2003).

Externally, the results indicated that the set of KPIs utilised were predominantly financial in nature and largely in line with requirements of the regulatory authority and contemporary accounting practice and standards (APRA 2003). However, the

survey results also showed marked differences in the actual KPIs utilised by the commercial/retail banks compared to the credit unions (Tables 9.4 and 9.5) thus confirming the differences in the management and operation of these two type of FIs initially observed during the Case research (Chapters 7 and 8).

To elaborate, Duncan and Elliot (2002), in their study of customer service quality, identified Interest Margins, Return On Assets and Capital Adequacy as useful performance indicators in the FSS. Campbell (1992) suggested that organisational performance in the FSS may be best understood using what he termed the four main income drivers for banking institutions, Net Interest Income, Non Interest Income, Operating Expense and Credit Quality. This research confirmed these observations and specifically identified the most commonly cited KPIs for both industries (Tables 9.4 and 9.5).

Internally, there appeared to be less consistency as the use of particular KPIs varied by organisation. The most commonly utilised mechanism for measuring performance in the FIs in the sample was the survey, typically based on capturing customers and/or staff perceptions and Service Level Agreements. Naturally, the actual KPIs in each of these mechanisms varied depending on the survey instrument used, its intention and the proposed audience. Clearly, this pattern of behaviour observed in the FIs with respect to the use of particular KPIs was consistent with Stakeholder theory where FIs were seen to utilise those KPIs that were perceived to be best understood by their stakeholders (D'Souza and Williams 2000).

One problem immediately identified and associated with the diversity of available KPIs was the difficulty of benchmarking between FIs. Further, the inconsistent application of KPIs also made direct comparison of organisational performance difficult (Palmer and Markus 2000). The caveat was that even where such indicators are used consistently, there might still be a need to normalise them in order to ensure that they all measure the same thing at the same time. An example of such is provided in 'depreciation' where different rates of depreciation may be applied which then affects the 'value' of IS/IT assets reported. This may in turn affect any performance ratios or indicators, such as Return On Assets (ROA), that rely on this measure (Bazley et al. 1993).

### **10.6.3 Proposition 3 – Managerial Effectiveness**

*Managerial effectiveness defines the role of management and its ability to utilise available resources (including IS investments) in order to achieve set objectives. Good management of IS investments contributes to better organisational performance.*

As stated in the above proposition, the Managerial effectiveness component of the conceptual model defined the role of management in the IS investment and organisational performance relationship.

Consequently, the conceptual model defined five factors that constitute this component, Senior management commitment to IS, Experience of organisation with IS, User satisfaction, Political environment and Organisational structure (Weill 1992; Markus and Soh 1993). Observations and analysis showed unequivocally that each of these factors can and does influence the management of IS investments. As with the intermediary variables, it is arguable that these factors are interrelated, thus do influence each other. The Organisational Behaviour literature provides sufficient evidence to support this argument (Wood et al. 2004).

In all cases, senior management commitment to IS was deemed to be very important to the management of IS investments. This observation was made even poignant by the fact that many IS investments can demand and do consume a significant large portion of a FI's resources, be they capital or labour (Hunter and Hitt 1997; Sriram 2003). Without high levels of this factor, it is inconceivable that an FI would commit the necessarily large resources required to maintain and acquire IS investments on an on-going basis.

With respect to the experience of organisation with IS, observations and analysis of the perceptions of participants indicated that this factor varied extensively amongst the FIs in the sample with the commercial/retail banks appearing to exhibit higher levels of this factor compared to the credit unions (Chapter 9). As the commercial/retail banks in the sample appeared to be better at planning for and utilising their IS investments it was concluded that higher levels of organisational experience did affect the IS investment and decision making process. In addition, it could be argued that, the better a FI's learning processes are, the higher its levels of

organisational experience with IS are likely to be (Andreu and Ciborra 1996). It may therefore be deduced that FIs that undertake activities such as SISP are likely to have higher levels of organisational experience as these processes incorporate evaluation processes that in turn contribute to organisational learning (Andreu and Ciborra 1996).

One issue that has been the focus of extensive study, not only in the IS/IT development literature, but also in the IS management literature has been the issue of user satisfaction. Suffice to say, many models have been proposed and tested that have attempted to quantify and measure user satisfaction (Bailey and Pearson 1983; DeLone and McLean 1992). A common feature of these studies has been the inherent assumption that higher levels of satisfaction lead to higher levels of performance in organisations (Ballantine et al. 1996). Thus, the confirmation of the presence of this factor in the Managerial effectiveness component in the sample of FIs (from both case and survey research) indicated that this factor does indeed have an impact on the IS investment and organisational performance relationship and further supported the inclusion of the Managerial effectiveness component in the conceptual model.

As with experience of organisations with IS, the political environment of an organisation is a result of organisational behaviour (Wood et al. 2004). Both the case and survey research indicated that the impact of this factor has been recognised by the FIs that participated in this research. In addition, observations in these FIs indicated that management were aware of the double-edged character of this factor as it could have both negative and positive implications (Wood et al. 2004). This observation was not particularly surprising as FIs by their nature tend to be bureaucratic (Harker and Zenios 2000a) and as such can be highly political environments (Mintzberg 1980). In addition, many decision processes in organisations in general are group processes (Pervan 1994b) and it is inevitable that individuals and groups will have some conflicting objectives, especially when it comes to IS given the very pervasive nature of IS in FIs (Wood et al. 2004). Analysis and observations clearly showed that this factor does influence IS investment decision-making and consequently organisational performance.

Last, but not least in this group of factors was the organisational structure factor. The literature is replete with evidence regarding the influence of this factor on IS

management in general and IS investment in particular (Avison, Cuthebertson and Powell 1999). Some authors, such as DeCanio, Dibble and Amir-Atefi (2000), go so far as to suggest that this factor may be important enough to influence the innovativeness of an organisation. It was evident from the FIs in the sample that organisational structures strongly influenced the effectiveness of management in general and IS management in particular with respect to IS investments and decision making (Ward and Peppard 2002).

Clearly, the presence of the Managerial effectiveness component in the conceptual model was supported by the evidence from this research and it can be concluded that Managerial effectiveness does influence the IS investment and organisational performance relationship as stated in the proposition relating this component.

#### **10.6.4 Proposition 4 – Considerations for SISP**

*Organisations that formulate and implement practical strategic plan(s) for IS are likely to have a stronger IS investment and organisational performance relationship than those that do not (under similar conditions).*

The conceptual model suggests a secondary relationship between organisational performance and IS investment that effectively completes the IS investment cycle. The presence of the considerations for SISP component completes the model and provides an essential feedback loop to the IS investment process. In so doing, this component also brings into play the issue of time lags and their effect on the realisation of benefits from IS investment (Chapter 4).

For the FIs that participated in the Case research, the results (Chapters 7 and 8) showed that SISP was present in the commercial/retail banks but not in the credit unions (with one exception). Further, the results of the survey exhibited a similar pattern with SISP being rated higher on average in commercial/retail banks compared to credit unions (Table 9.9).

Evidence from the cases showed that the presence of the nine factors that constitute the considerations of SISP in those FIs that practice SISP was non-homogenous. However, observations and analysis of the FIs showed that they all utilised an

organisational approach to SISP (Earl 1993). Despite the common approach to SISP, there were clear differences in the strategies adopted which led to the deduction that this was as a result of the different levels of emphasis placed the different factors.

The foregoing observations therefore imply that the considerations for SISP component can and does influence the level of IS investment as depicted by the conceptual model. This conclusion is consistent with the literature on SISP (Ward and Peppard 2002; Pearlson and Saunders 2004). It is therefore argued that this component enables FIs to better plan for and more effectively utilise IS resources during an IS investment cycle. In addition, this component also provides a mechanism for evaluating the efficiency of the deployment of IS resources and the resultant impact on organisational performance (Symons 1991; Powell 1992).

In verifying the presence of this component, the research provided support for the proposition and thus further bolstered the conceptual model.

### **10.6.5 Proposition 5 – Organisational context**

*The context of an organisation will have a marked effect on its IS investment and organisational performance relationship.*

The issue of context is one that many studies into the IS investment and organisational performance relationship have not adequately addressed (Harker and Zenios 2000b; Avgerou 2001; Trauth 2001).

Analysis indicated that issues regarding competition and regulation were amongst the most cited as having an impact on the relationship between IS investment and organisational performance. Further analysis revealed that IS investments can and are influenced by these contextual issues (Avgerou 2001). Of particular note was the deduction that two modes of IS investment, *mandatory* and *discretionary*, typically arise due to the influence of context.

Mandatory IS investments arise out of the need to comply with changes in the regulatory framework as introduced from time to time by the regulatory authorities. The changes imposed may be significant from a cost perspective and hence affect a

FI's IS expenditure levels in any one or more IS investment cycles. Discretionary IS investments on the other hand constitute the majority of the IS investments as they are made by FIs as part of their operational and strategic processes. Like the former, these may also have significant cost implications in any IS investment cycle.

Thus, it may be concluded from the foregoing discussions that the study's propositions were all strongly supported by the results obtained from this research. The deductions arising from the foregoing discussions will now be presented.

### **10.7 Deductions**

First, based on the results obtained, it was evident that IS investments do impact upon organisational performance. Specifically, it was noted that this impact tends to be indirect as IS investments were targeted at a set of intermediary variables. This research revealed that this set of intermediary variables consisted of staff, operational efficiency, product delivery and customer service quality. The results suggest that IS investments are typically designed to cause improvements in these variables that in turn enable FIs to attain higher levels of organisational performance, both internally and externally.

Second, the results indicated that viewing IS investments as a portfolio was a valid and practical mechanism that IS management can utilise to better understand the behaviour of their IS investments. Of three types of IT in the portfolio, TPS were considered to contribute most to organisational performance as they carried value in the form of customer transactions. Further, the survey, enabled the identification of key management ratios that could be utilised to quantify these IS investments in future research (Chapter 9).

Third, the results clearly showed that the role of management in the IS investment and organisational performance relationship was very important as it influences IS investments from a range of perspectives including; the nature, the type, the value and the management of IS investments.

Fourth, organisational performance itself also affects the level of IS investment. Analysis of participants' responses in the Case research suggested that successful FIs were likely to have a higher appetite for IS investments, which in turn were then deemed to contribute to even higher levels of performance and so on and so forth. In addition, the results suggested that FIs that utilised SISP were in a better position to obtain the maximum returns/benefits on their current and future investments in IS.

Fifth, the results from the cases indicated that an IS investment threshold does exist for FIs and determined to generally lie in the 10% to 20% range. In addition, the survey enabled the explicit quantification of the IS investment thresholds for the commercial/retail banking (7.50%) and credit union industries (16.55%) in the Australian FSS and thus facilitated a better understanding of the differences in IS investment levels between the two industries. The results therefore indicated that this concept can be a very useful tool, not only in the determination of appropriate levels of IS investments, but also in benchmarking against other FIs, and consequently can influence the IS investment and organisational performance relationship.

Thus, it has been demonstrated that by comprehensively addressing each of the propositions, this research has achieved its objectives and in so doing, has addressed the research questions.

## **10.8 Chapter Summary**

This chapter set out to present a summary and discussion of the key findings of the research project. To achieve this, five objectives were identified:

- a) To compare the composite extended conceptual models.
- b) To discuss the emergent set of intermediary variables.
- c) To discuss the implications of the concept of an IS investment threshold.
- d) To discuss the relevance of context.
- e) To review the propositions and answer the research questions



Each of these objectives was addressed in detail, beginning with a synopsis of the research followed by a comparison of the composite extended models deduced from this research. In addition, the emergent set of variables was thoroughly discussed to demonstrate the role of each variable in the composite extended models and thus illustrate how these variables may interact within the models.

Further, this chapter provided detailed reviews and discussions of the study's propositions to demonstrate how the research problems were resolved. The discussions showed how each of the propositions was supported by the research findings, which in turn contributed to the final resolution of the research problem. Furthermore, the implications of the resultant models to both theory and practice were discussed and it was shown how they clearly establish the conceptual models' suitability and applicability not only in explaining the IS investment and organisational performance relationship, but also in providing a basis for future research.

In the final analysis, this research has resulted in the derivation of an IS investment and organisational performance model that clearly explains this relationship in two industries of the Australian FSS.

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# *11.0 Contribution, Conclusions and Recommendations*

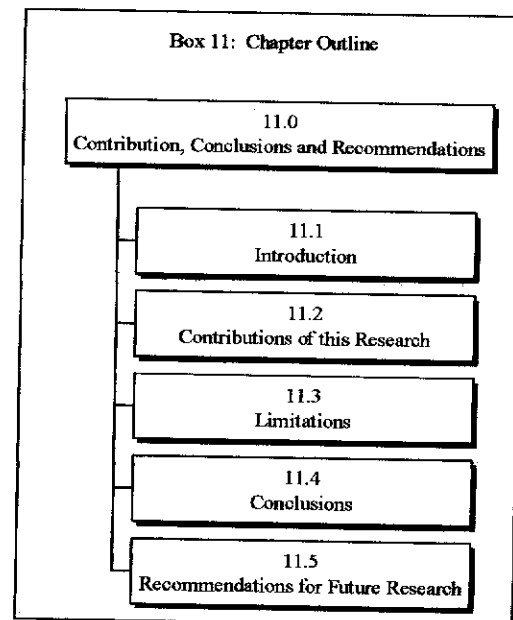
## **11.1 Introduction**

This final chapter sets out the contributions, conclusions and recommendations arising from this research.

Section 11.2 presents and discusses the contributions, both conceptual and practical of this research.

Section 11.3 follows with a discussion of the limitations of the research.

Section 11.4 presents the conclusions drawn from this research and last but not least, Section 11.5 concludes the chapter by presenting the recommendations arising from this research.



## **11.2 Contribution of this Research**

The implications of the composite extended conceptual models for each of the two industries in the Australian FSS were discussed in detail in Chapters 7, 8, 9 and 10. Consequently, the following sub-sections present a summary of these earlier discussions. In addition, the contributions highlighted here further demonstrate the validity of this research and the applicability and suitability of the resultant models to this field of IS research and management.

### **11.2.1 Conceptual**

The implications and contribution of this research and resultant extended composite conceptual models to theory are as follows:

1. At the time that this research was conducted, it was the only known research of its nature that thoroughly investigated the IS investment and organisational performance relationship in the Australian FSS (most studies to date have been conducted in the United States of America).
2. This research succeeded in developing and testing a conceptual model of the relationship between IS investment and organisational performance in the FSS that answered questions relating to the nature of the relationship between IS investments and organisational performance (Chapter 7, 8 and 9).
3. This research determined that the relationship between IS investment and organisational performance in FIs was a positive, but indirect, relationship moderated by a set of intermediary variables upon which IS investment appears to have the most impact and which in turn influence organisational performance. Thus, the research was able to explain and hence provide a clearer understanding of the relationship between IS investment and organisational performance (Chapter 7, 8 and 9).
4. By utilising Resource Based View of the firm theory (Chapter 4), this research was able to demonstrate that not all IS investment is the same and each of type of IS investment has consequent implications for organisational performance. Further, the research clearly demonstrated that there are differences that exist between industries in the FSS which also have implications for the IS investment and organisational performance relationship. The resultant conceptual models therefore present a strong foundation for further research into the relationship between IS investment and organisational performance within the FSS. Prior research may not have considered these differences and this may help explain some of the inconsistencies observed in the literature (Chapter 2).
5. This research (and its resultant models) contributes significantly to the extant literature and provides unique insights into this field of knowledge by

providing a comprehensive review of the literature together with a meta-analysis of the same (Chapters 2 and 3). This meta-analysis appears to be the first of its type conducted in this field of research, namely the business value of IS, to date.

6. The research was comprehensive, thorough with the conceptual model being developed and tested utilising two research methods a process that therefore facilitated triangulation and comparative analyses of the results obtained. Thus the research design developed for this research was a highly flexible and adaptable tool that can be used by other researchers to address a variety of research problems in this and other fields of IS. The research design incorporated the use of two methods, one to develop and the other to test the conceptual model as follows (Chapter 6):

- a. Case research: In developing the conceptual model, a novel but detailed and comprehensive case study protocol was designed. This case study protocol is a very flexible tool that may be adopted and adapted by other researchers to conduct other research, not only into the IS investment and organisational performance relationship, but in other fields of IS.
- b. Survey: A survey was utilised to test the conceptual model on a wider sample of FIs in the Australian FSS. The results obtained from the survey supported the findings of the Case research and thus showed that the conceptual model to be practical, suitable and applicable to explaining the IS investment and organisational performance relationship in the Australian FSS.

The results obtained from both research methods were consistent and showed that this research succeeded in addressing the research questions. Further, the successful integration and application of two research methods in a pluralist approach was a unique approach in this type of research and demonstrated that, not only is this approach feasible, it can result in novel findings that contribute to knowledge.

7. One of the problems cited in prior research has been a lack of consistency in results due to the multiplicity of variables utilised by researchers. This

exploratory research succeeded in resolving this problem by identifying variables that could be utilised in future research as follows (Chapter 9):

- a. A set of IS management ratios that could be used to quantify IS investments. These were: i) IT expense/Total Assets, ii) IT expense budget (Total IT expenditure), iii) Fixed Software maintenance costs and, iv) Software development project costs.
- b. Two sets of KPIs, both internal and external, that could be used to quantify organisational performance (Table 9.3).

Further, this research was able to explain the observed multiplicity of variables in this field of research by applying Stakeholder theory (Chapter 4). It is therefore recommended that the foregoing variable sets be utilised in future research in conjunction with structured research designs such as that discussed in item 5 above. Such an approach to research in this field would not only create a cumulative tradition of research, it would also bring more consistency to this field of research and thus result in research that has greater comparability and generalisability.

8. Given the apparent lack of theory in the literature regarding the nature of the relationship between IS investment and organisational performance, this research has contributed to this field of research by identifying a set of intermediary variables in the IS investment and organisational performance relationship that are deemed to influence this relationship. These variables were: a) Operational efficiency, b) Staff, c) Product delivery and d) Customer service quality (Chapters 7, 8 and 9).
9. This research succeeded in identifying a number of weaknesses in earlier research within the extant literature (Chapter 2 and 3) and systematically addressed them through a comprehensive research design (Chapter 6).
10. This research builds on existing research into Strategic Information Systems Planning (SISP) by incorporating theory from that field regarding the factors that govern the SISP process and the types of SISP approaches utilised by organisations to explain the IS investment and organisational performance relationship (Chapter 4).

11. This research broadens the theoretical base as few studies of this nature have been conducted, due in part to the complexity of conducting such research. Markus and Soh (2000) also highlighted the lack of a strong theoretical base in this area of study.
12. This research focused on a single sector of the economy, the FSS. Within that sector, the research focussed primarily on the commercial/retail banking and credit union industries. Previous investigations, on the other hand, have tended to be broad in their scope and consequently their results were difficult to generalise. Harris and Katz (1988) observed that it is important to measure/study organisations within a single industrial or business sector in order to generate any useful data, the analysis of which can then make a more meaningful contribution to the growth of knowledge.

Given the foregoing, this research can now be extended to other economic sectors, not only to better understand IS investment and organisational performance in those economic sectors, but to also provide a basis for comparison with the results obtained for the FSS. This would also facilitate an extension of the generalisability of the results and hence improve upon the external validity of the research instruments.

### **11.2.2 Practical**

The implications of the extended composite conceptual models to practice are as follows:

1. This research increases understanding of the impact of IS investments on organisational performance in the FSS through the development of a conceptual model that clearly explains this relationship.
2. This research clearly showed that there were differences in the management of IS investments between the commercial/retail banks and credit unions in the sample. This was evident in the derivation of two similar, yet different, extended conceptual models through the Case research method (Chapters 7 and 8). The differences were also confirmed later in testing via the Survey

method that also clearly demonstrated how commercial/retail banks placed greater emphasis on the SISP process than credit unions (Chapter 9).

3. Management may now have a clearer understanding of the areas upon which IS investments have the most impact by considering the set of intermediary variables. This conclusion has clear implications for management as it informs their choices when it comes to IS investment decisions.
4. Management may now have a clearer understanding of the contextual factors that influence the IS investments and organisational performance relationship. This research explicitly identified regulation and competition within the Australian FSS as two contextual issues that influence the type of IS investments (discretionary or mandatory) that FIs may undertake.
5. The identification of an IS investment threshold has implications for management with respect to IS investments. Two immediate practical implications were identified:
  - a. Management can utilise the IS investment threshold as a tool for determining appropriate levels of IS investment either as an enabler when used to encourage IS investment or a limiter when used to control IS investment.
  - b. The IS investment threshold can be used as a benchmark for comparison with other FIs and against best practice within a given industry or across industries.
6. By understanding the individual components of the conceptual model and the behaviour of the conceptual model as a whole, management may now better understand the IS investment and organisational performance relationship. Consequently, management will be in a better position to answer questions posed in the literature (Chapter 2) regarding:
  - a. How much they are actually spending on IS investments.
  - b. The value/benefit derived from IS investments.
  - c. How to evaluate various IS investment alternatives.
  - d. Why IS budgets continue to rise when IS/IT unit costs are either falling or staying relatively constant.

- e. How they regain their confidence in the returns from current and future IS investments.
7. The research addresses the issue of the productivity paradox and clearly demonstrates that investments in IS are perceived to contribute to organisational performance. Consequently, management may now be in a better position to explain the benefits arising from existing and future IS investments. Furthermore, management may now have a tool for the effective and efficient management of IS investments within their FIs.

As can be seen in the foregoing, these implications are significant and important to both theory and practice. The resultant models may be used by both researchers and IS professionals in the management of IS investment and hence facilitate an even better understanding of the IS investment and organisational performance relationship.

### **11.3 Limitations of this Research**

The following limitations were observed to have an impact on this research. It should be noted however, that in some instances, some of the limitations were beyond the control of the researcher. Despite the foregoing, strenuous efforts were made to reduce their impact, which resulted in the successful conduct of this research.

1. *This research was an exploratory research project and hence there is a need, in future, to further investigate and understand the constituent variables that make up the components of the conceptual model.*

This research was successful in identifying and verifying the components of the conceptual models. However, there is a need to further extend this research in order that the variables that make up the individual component may be better understood.



2. *Reluctance by FIs to participate in academic research despite the obvious advantages.*

It was observed that there was an apparent reluctance by FIs in general to participate in academic research. One possible reason behind this reluctance appeared to be an apparent 'fear' that such research may 'expose' weaknesses of the organisation in general and management in particular. This limitation was overcome in the Case research by (Chapter 6):

- Limiting the number of cases as per recommended Case research guidelines.
- Having informal meetings with senior management to gain approval for research

Both of these tactics were found to be a very effective and it is recommended that future researchers adopt these or similar tactics in their research designs. However, the impact of this limitation was felt more strongly during the survey, resulting in a much lower than expected response rate. It should be noted that steps were taken to boost the response rate including, sending personally addressed survey packages, follow-up by email and the provision of electronic copies of the survey instrument to potential respondents.<sup>16</sup>

3. *Time constraints.*

As this research was conducted to fulfil the requirements of the award of a Doctoral degree, there was an inherent time constraint arising out of the need to complete the research in a specified time frame. In an attempt to minimise the impact of this limitation, the research design allowed for:

- Cases to be conducted concurrently were possible
- Data collection and analysis to be conducted iteratively until saturation was attained

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<sup>16</sup> Refer to Chapter 9 for a complete discussion on this issue

Using these tactics, the research was completed within the allocated time frame. However, it may be argued that more time would have enabled the researcher to collect even more data, which in turn would have further enhanced. Suffice to say the results were of good quality such that the research questions were fully addressed (Chapter 10).

*4. Lack of extensive prior research in this field, particularly in the Australian FSS.*

This limitation affected the research in that there did not appear to be strong foundation upon which this research could be built. Despite the foregoing, this limitation was perceived to present a unique opportunity to explore this field of research and without the constraints of prior research was able to utilise a unique research design that has contributed significantly to increasing the body of knowledge in this field. Hence this research was designed not only as an exploratory research aimed at exploring the IS investment and organisational performance relationship, but also to create a foundation for future research into this very important field of research.

It is therefore recommended that future researchers endeavour to further mitigate these limitations in their attempts to extend and refine this research. Despite the foregoing limitations, the research was successfully conducted. This success may be attributed to the development and application of a robust and flexible research design supported by valid and reliable research instruments that enabled the researcher to minimise the effects of the aforementioned limitations.

## **11.4 Conclusions**

This research set out to explore the relationship between IS investment and organisational performance in the Australian FSS and in so doing, was to answer a set of six research questions. The apparent lack of theory exhibited by the extant literature suggested the need for a research design that would facilitate the

development of theory in this field. In addition, the apparent lack of testable models observed in the literature supported the adoption of a pluralist approach to develop and test the proposed conceptual model. Consequently, the research design developed for this research utilised both case and survey research methods. These methods were successfully applied resulting in two composite extended models that highlighted differences in the IS investment and organisational performance relationship between the focal industries in the Australian FSS.

Thus, a number of key findings resulted from this research. First and foremost, the research was able to identify and confirm the components of the IS investment and organisational performance relationship as proposed in the original conceptual for FIs. In addition to simply developing the conceptual model, the research went further to test the model in a larger sample of FIs within the Australian FSS. This aspect of the research was extremely important as it created a basis for future research by providing a tested conceptual framework upon which further research may be built.

Second, it was evident that the IS investment and organisational performance relationship is moderated by a set of intermediary variables, staff, product delivery, operational efficiency and customer service quality. The results suggested that FIs invest in IS to improve these areas and consequently improve upon their performance. This was perhaps one of the most significant findings of this research and it enabled the original conceptual model to be extended and hence enhanced its ability to explain the IS investment and organisational performance relationship.

Third, the research was able to test the applicability of the concept of an IS investment threshold and clearly demonstrated how this concept may be used to manage IS investments and in so doing influence the IS investment and organisational performance relationship.

Fourth, by utilising Case research, this research was able to gain insights into the contextual factors that may influence IS investment and organisational performance in the FSS. Such knowledge may not have been gained had a different research method been adopted. This was significant as prior research had identified the impact of contextual factors but had not specified what these factors might be.

Finally, despite the limitations of the study, this research produced consistent and reliable results which led to the overall conclusion that this research was able to achieve its key objective of developing and testing a conceptual model that will ultimately facilitate and foster a better understanding of the relationship between IS investment and organisational performance.

### **11.5 Recommendations for Future Research**

This research was successful in developing and testing a conceptual model of the relationship between IS investment and organisational performance in commercial/retail banks and credit unions in the Australian FSS. In addition, this research identified a number of areas that may warrant attention in future research:

1. More research is required to enhance our understanding of the variables that make up the components of the composite extended conceptual models.
2. Further research is needed to explain the composition, role and impact of the set of intermediary variables derived by this research.
3. More extensive testing of the composite extended conceptual models within the FSS is required to further strengthen these models and improve their generalisability.
4. There is a need to extend this research to other economic sectors in order to improve the explanatory power of the conceptual model.
5. Further research is required to test and quantify the IS investment threshold in the FSS. In addition, research should be undertaken to determine the applicability of this concept to other economic sectors.

**END OF THESIS**

# 12.0 References

## 12.1 References

- ABS 2001, *Australian Standard Classification of Education(ASCED) Field of Education Structure and Definitions. Definitions - 02 Information Technology*, Available:  
[<http://www.abs.gov.au/ausstats/abs@.nsf/0/B06BD3DFC01B6A1BCA256AAF001FCA5F?Open>] (21 July 2001).
- ABS 2002, *Measuring Australia's Progress 2002 - The supplementary commentaries Capital formation*, Available:  
[<http://www.abs.gov.au/ausstats/abs@.nsf/0/D24411E974BDA313CA256BDC0012241A?Open>] (21 July 2003).
- Alavi, M. and Carlson, P. 1992, 'A Review Of MIS Research and Disciplinary Development', *Journal of Management Information Systems*, vol. 8, no. 4, pp. 45-62.
- Alloway, R. M. and Quillard, J. A. 1981, 'Top Priorities For The Information Systems Function', In *CISR Working Paper No 79*, Sloan School Of Management, Massachusetts Institute Of Technology, Cambridge, Massachusetts.
- Alpar, P. and Moshe, K. 1990, 'A Microeconomic approach To The Measurement Of Information Technology Value', *Journal of Management Information Systems*, vol. 7, no. 2, pp. 55-69.
- Andersen, T. J. 2001, 'Information Technology, Strategic Decision Making Approaches And Organisational Performance In Different Industrial Settings', *Journal of Strategic Information Systems*, no. 10, pp. 101 - 119.
- Andreu, R. and Ciborra, C. 1996, 'Organisational Learning And Core Capabilities Development: The Role Of IT', *Journal Of Strategic Information Systems*, vol. 5, pp. 111 - 127.

- APRA 2003, *Australian Prudential Regulatory Authority Statistics Page*, Available: [<http://www.apra.gov.au/statistics/australian-banking-statistics.cfm>] (01 March 2004).
- APRA 2004, *Authorised Deposit-Taking Institutions*, Available: [<http://www.apra.gov.au/adi/>] (01 March 2004).
- Avgerou, C. 2001, 'The Significance Of Context In Information Systems And Organisational Change', *Information Systems Journal*, no. 11, pp. 43 - 63.
- Avison, D. E., Cuthebertson, C. H. and Powell, P. 1999, 'The Paradox Of Information Systems: Strategic Value And Low Status', *Journal Of Strategic Information Systems*, vol. 8, pp. 419 - 445.
- Bailey, J. E. and Pearson, S. W. 1983, 'Development Of A Tool For Measuring And Analysing Computer User Satisfaction', *Management Science*, vol. 29, no. 5, pp. 530 - 545.
- Ballantine, J. A., Bonner, M., Levy, M., Martin, A. and Powell, P. 1996, 'The 3-D Model Of Information Systems Success: The Search For The Dependent Variable Continues', *Information Resources Management Journal*, vol. 9, no. 4, pp. 5 - 14.
- Ballantine, J. A., Galliers, R. D. and Stray, S. J. 1996, 'Information Systems/Technology Evaluation Practices: Evidence From UK Organisations', *Journal of Information Technology*, vol. 11, pp. 129 - 141.
- Banker, R. D. and Kauffman, R. J. 1988, 'Strategic Contributions Of Information Technology: An Empirical Study Of ATM Networks', in *Proceedings Of The Ninth International Conference On Information Systems*, QED Information Sciences, Inc, Wellesley, Massachusetts, pp. 141-150.
- Banker, R. D., Kauffman, R. J. and Morey, R. C. 1990, 'Measuring Gains In Operational Efficiency From Information Technology: A Study Of The Positran Deployment At Hardee's Inc', *Journal of Management Information Systems*, vol. 7, no. 2, pp. 29-54.
- Barki, H., Rivard, S. and Talbot, J. 1988, 'An Information Systems Keyword Classification Scheme', *MIS Quarterly*, pp. 299-322.

- Barkos, J. Y. 1987, 'Dependent Variables for The Firm And Industry-Level Impacts Of Information Technology', in *Proceedings Of The Eighth International Conference On Information Systems*, Pittsburgh, pp. 10 - 23.
- Barney, J. B. 1991, 'Firm Resources And Sustained Competitive Advantage', *Journal Of Management*, no. 17, pp. 99 - 120.
- Barney, J. B. 1997, *Gaining And Sustaining Competitive Advantage*, Addison Wesley Publishing Company, Reading, MA.
- Barua, A., Kriebel, C. and Mukhopadhyay, T. 1991, 'An Economic Analysis Of Strategic Information Technology Investments', *MIS Quarterly*, pp. 312 - 331.
- Bazley, M., Hancock, P., Berry, A. and Jarvis, R. 1993, *Contemporary Accounting: A Conceptual Approach*, Thomas Nelson Australia, South Melbourne, Victoria.
- Benaroch, M. and Kauffman, R. J. 2000, 'Justifying Electronic Banking Network Expansion Using Real Options Analysis', *MIS Quarterly*, vol. 24, no. 2, pp. 197-.
- Benbasat, I., Goldstein, D. K. and Mead, M. 1987, 'The Case Research Strategy In Studies Of Information Systems', *MIS Quarterly*, no. September, pp. 369 - 386.
- Benbasat, I. and Weber, R. 1996, 'Research Commentary: Rethinking "Diversity" In Information Systems Research', *Information Systems Research*, vol. 7, no. 4, pp. 389 - 399.
- Benbasat, I. and Zmud, R. 1999, 'Empirical Research In Information Systems: The Practice Of Relevance', *MIS Quarterly*, vol. 23, no. 1, pp. 3 - 16.
- Bender, D. 1986, 'Financial Impact Of Information Processing', *Journal of Management Information Systems*, vol. 3, no. 2, pp. 232-238.
- Berger, A., N. and Mester, L. J. 2000, 'Inside The Black Box: What Explains Differences In The Efficiencies Of Financial Institutions?', in *Performance Of Financial Institutions: Efficiency, Innovation, Regulation*, eds. Harker, P. T. and Zenios, S. A., Cambridge University Press, New York.

- Bharadwaj, A. S. 2000, 'A Resource-Based Perspective On Information Technology Capability And Firm Performance: An Empirical Investigation', *MIS Quarterly*, vol. 24, no. 1, pp. 169 - 196.
- Birch, D. and Young, M. A. 1997, 'Financial services and the Internet - what does cyberspace mean for the financial services industry?', *Internet Research*, vol. 7, no. 2.
- Boaden, R. and Lockett, G. 1991, 'Information Technology, Information Systems And Information Management: Definition And Development', *European Journal Of Information Systems*, vol. 1, no. 1, pp. 23 - 32.
- Boar, B. 2001, *The Art Of Strategic Planning For Information Technology*, 2nd edn, John Wiley And Sons, New York.
- Boon, S. N. 1988, 'Factors Facilitating The Use Of Information Technology For Competitive Advantage: An Exploratory Study', *Information and Management*, no. 15, pp. 191 - 201.
- Borovits, I. and Gilardi, R. 1993, 'Evaluating Cost/Utilisation Of Organisations' Information Systems And Users', *Information and Management*, no. 25, pp. 273 - 280.
- Brenner, S. and Cochran, P. 1991, 'The Stakeholder Theory Of The Firm: Implications For Business, Society, Theory And Research', in *IABS Proceedings*, pp. 449 - 467.
- Bresnahan, T. F. 1986, 'Measuring The Spillovers From Technical Advance: Mainframe Computers In the Financial Services.', *American Economic Review*, vol. 76, no. 4, pp. 742-755.
- Brown, G., Fisher, M., Stoll, N., Beekma, D., Black, M., Taylor, R., Yon, C. S., Williams, A. J., Bryant, W. and Jansen, B. J. 2000, 'Using The lessons Of Y2K To Improve Information Systems Architecture', *Communications Of The ACM*, vol. 43, no. 10.
- Brown, R., Milne, N., Srinivasan-Ayer, A., Hinds, P. and Kellock, M. 2002, *Australia Banking and Finance- Financial Services Digest*, Deutsche Bank, Sydney.



- Brynjolfsson, E. 1993, 'The Productivity Paradox Of Information Technology', *Communications Of The ACM*, vol. 35, pp. 67-77.
- Brynjolfsson, E. 1996, 'The Contribution Of Information Technology to Consumer Welfare', *Information Systems Research*, vol. 7, no. 3, pp. 281 - 300.
- Brynjolfsson, E. and Hitt, L. 1996, 'Paradox Lost? Firm Level Evidence On The Returns To Information Systems Spending', *Management Science*, vol. 42, no. 4, pp. 541-558.
- Brynjolfsson, E. and Hitt, L. 1998, 'Beyond The Productivity Paradox', *Communications Of The ACM*, vol. 41, no. 8, pp. 49 - 55.
- Byers, R. E. and Lederer, P. J. 2001, 'Retail Bank Services Strategy: A Model Of Traditional, Electronic And Mixed Distribution Choices', *Journal Of Management Information Systems*, vol. 18, no. 2, pp. 133 - 156.
- Byrd, T. A. and Turner, D. E. 2001, 'An Exploratory Examination Of The Relationship Between Flexible IT Infrastructure And Competitive Advantage', *Information And Management*, no. 39, pp. 41 - 52.
- Campbell, R. J. 1992, 'Does Technology Deliver?', *Bankers Monthly*, vol. 109, no. 3, p. 17.
- Carr, N. G. 2003, 'IT Doesn't Matter', *Harvard Business Review*, no. June1.
- Carrington, M., Llanguth, P. and Steiner, T. D. 1997, 'The Cost Of Technology', *The Banker*, vol. 147, no. 861, pp. 49-50.
- Cavaye, A. L. M. 1996, 'Case Study Research: A Multi-Faceted Research Approach For IS', *Information Systems Journal*, no. 6, pp. 227-242.
- Chan, Y. E. 2000, 'IT Value: The Great Divide Between Qualitative And Quantitative And Individual Organisational Measures', *Journal of Management Information Systems*, vol. 16, no. 2, pp. 225 - 261.
- Chau, P. Y. K. 1999, 'On The Use Of Construct Reliability In MIS Research: A Meta Analysis', *Information and Management*, no. 35, pp. 217-227.
- Chong, F. 2002, 'Corporate Backlash Against IT', In *The Australian*.
- Clemons, E. K. and Knez, M. 1988, 'Competition And Cooperation In Information Systems', *Information and Management*, no. 15, pp. 25 - 35.

- Cooke, R. 1989, 'Aussie Style: Member Service And Employee Development Get Top Billing Down Under', *Credit Union Management*, no. August 1989, pp. 22 - 26.
- Crapp, H. and Skully, M. T. 1985, *Credit Unions For Australians*, George Allen and Unwin Australia Pty Ltd, North Sydney.
- CRB1 2002a, *2002 At A Glance*, CRB1.
- CRB1 2002b, *Annual Report 2002*, CRB1.
- CRB1 2002c, *Our Social Impact Report: A Fresh Perspective.*, CRB1.
- CRB1 2003a, *CRB1 Website*, Available:  
[<http://www.westpac.com.au/internet/publish.nsf/Content/PB+HomePage>]  
(01 June 2003).
- CRB1 2003b, 'The Team At The Top', In *CRB1 Newsletter*, CRB1, pp. 11 - 14.
- CRB2 1999, *Annual Report 1999*, CRB2.
- CRB2 2002, *Annual Report 2002*, CRB2.
- CRB2 2003, *CRB2 Website*, Available: [<http://www.nabgroup.com>] (10 April 2004).
- Cron, W. L. and Sobol, M. G. 1983, 'The Relationship Between Computerisation and Performance: A Strategy for Maximising Economic Benefits of Computerisation', *Information and Management*, vol. 6, pp. 171-181.
- Cronin, J. J. and Taylor, S. A. 1992, 'Measuring Service Quality: A Reexamination And Extension', *Journal Of Marketing*, vol. 56, pp. 55 - 68.
- Croteau, A.-M. and Bergeron, F. 2001, 'An Information Technology Trilogy: Business Strategy, Technological Deployment And Organisational Performance', *Journal of Strategic Information Systems*, no. 10, pp. 77-99.
- CUC2 2002a, *Annual Report 2002*, CUC2.
- CUC2 2002b, *Corporate Services Business Plan 2002/2003*, CUC2.
- CUC2 2002c, *Financial Report 2002*, CUC2.
- CUC2 2002d, 'Newsletter', Perth, pp. 1 - 16.
- CUC3 2003a, *CUC3 Annual Report*, CUC3.

- CUC3 2003b, *CUC3 Website*, Available: [<http://www.unitedcredit.com.au/>] (15 January 2004).
- Culnan, M. J. 1986, 'The Intellectual Development Of Management Information Systems, 1972 - 1982: A Co-Citation Analysis', *Management Science*, vol. 32, no. 2, pp. 156 - 172.
- Culnan, M. J. and Swanson, E. B. 1986, 'Research In Management Information Systems, 1980 - 1984: Points Of Reference', *MIS Quarterly*, pp. 289 - 302.
- CUSCAL 2002, *Annual Report 2002*, Credit Union Services Corporation Australia Limited.
- CUSCAL 2003, *Australian Credit Union Network Website*, Available: [<http://www.cu.net.au/presentation/homepage.asp>] (5 March 2003).
- CUUPC 1988, *Credit Union Philosophy and Uniqueness*, Credit Union National Association, Madison, WI.
- Dale, R. 1996, 'Regulating The New Financial Markets', in *Reserve Bank Of Australia Conference, 1996: The Future Of The Financial System*, ed. Edey, M., Reserve Bank Of Australia, The H.C. Coombs Centre for Financial Studies, Kirribilli.
- Daniel, E. 1999, 'Provision of electronic banking in the UK and the Republic of Ireland', *The International Journal of Bank Marketing*, vol. 17, no. 2.
- D'Aveni, R. 1994, *Hypercompetition: Managing The Dynamics Of Strategic Maneuvering*, Free Press, New York.
- Davern, M. J. and Kauffman, R. J. 2000, 'Discovering Potential And Realised Value From Information Technology Investments', *Journal of Management Information Systems*, vol. 16, no. 4, pp. 121 - 143.
- Davenport, T. H., Hammer, M. and Metsisto, T. J. 1989, 'How Executives Can Shape Their Company's Information Systems', *Harvard Business Review*, vol. Mar/Apr, pp. 130 - 134.
- Davenport, T. H. and Markus, L. M. 1999, 'Rigor Vs Relevance: Response To Benbasat And Zmud', *MIS Quarterly*, vol. 23, no. 1, pp. 19 - 23.

- De Lucia, R. and Peters, J. 1998, *Commercial Bank Management*, 4th edn, LBC Information Services, 50 Waterloo Rd, North Ryde, NSW 2113.
- Dearden, J. 1972, 'MIS Is A Mirage', *Harvard Business Review*, no. January/February, pp. 90 - 99.
- DeCanio, S. J., Dibble, C. and Amir-Atefi, K. 2000, 'The Importance Of Organisational Structure For The Adoption Of Innovations', *Management Science*, vol. 46, no. 10, pp. 1285 - 1299.
- DeLone, W. H. and McLean, E. R. 1992, 'Information Systems Success: The Quest For The Dependent Variable', *Information Systems Research*, vol. 3, no. 1, pp. 60-95.
- Devaraj, S. and Kohli, R. 2000, 'Information Technology Payoff In The Health-Care Industry: A Longitudinal Study', *Journal of Management Information Systems*, vol. 16, no. 4, pp. 41 - 67.
- Dewan, S. and Kraemer, K. L. 2000, 'Information Technology And Productivity: Evidence From Country-Level Data', *Management Science*, vol. 46, no. 4, pp. 548 - 562.
- Dewan, S., Michael, S. C. and Min, C.-K. 1998, 'Firm Characteristics And Investments In Information Technology: Scale And Scope Effects', *Information Systems Research*, vol. 9, no. 3, pp. 219 - 232.
- Dewan, S. and Min, C.-K. 1997, 'The Substitution Of Information Technology For Other Factors Of Production: A Firm Level Analysis', *Management Science*, vol. 43, no. 12, pp. 1660 - 1675.
- Doll, W. J. 1989, 'Information Technology's Strategic Impact On The American Air Travel Service Industry', *Information and Management*, no. 16, pp. 269 - 275.
- Donaldson, T. 1999, 'Making Stakeholder Theory Whole', *Academy Of Management Review: The Academy Of Management Review*, vol. 24, no. 2, pp. 237 - 241.
- Donaldson, T. and Preston, L. E. 1995, 'The Stakeholder Theory Of The Corporation: Concepts, Evidence And Implications', *Academy Of Management Review: The Academy Of Management Review*, vol. 20, no. 1, pp. 65 - 91.

- Dos Santos, B. L. 1991, 'Justifying Investments In New Information Technologies', *Journal of Management Information Systems*, vol. 7, no. 4, pp. 71-90.
- Drago, W. 1997, 'Organisation Structure And Strategic Planning: An Empirical Examination', *Management Research News*, vol. 20, no. 6.
- D'Souza, D. E. and Williams, F. P. 2000, 'Appropriateness Of Stakeholder Approach To Measuring Manufacturing Performance', *Journal Of Managerial Issues*, vol. XII, no. 2, pp. 227 - 246.
- Duncan, E. and Elliot, G. 2002, 'Customer Service And Financial Performance Among Australian Retail Financial Institutions', *Journal Of Financial Services Marketing*, vol. 7, no. 1, pp. 25 - 41.
- Durkin, M., Howcroft, B., O'Donnell, A. and McCartan-Quinn, D. 2003, 'Retail bank customer preferences: Personal and remote interactions', *International Journal of Retail and Distribution Management*, vol. 31, no. 4/5.
- Earl, M. J. 1993, 'Experiences In Strategic Information Systems planning', *MIS Quarterly*, vol. 17, no. 1, p. 1.
- Earl, M. J. and Khan, B. 2001, 'E-commerce Is Changing The Face Of IT', *Sloan Management Review*, vol. 43, no. 1.
- Edey, M. and Gray, B. 1996, 'The Evolving Structure of the Australian Financial System', in *Reserve Bank Of Australia Conference, 1996: The Future Of The Financial System*, ed. Edey, M., Reserve Bank Of Australia, The H.C. Coombs Centre for Financial Studies, Kirribilli.
- Eisenhardt, K. M. 1989, 'Building Theories From Case Study Research', *Academy Of Management Review*, vol. 14, no. 4, pp. 532 - 550.
- Felix, R. 2003, 'A Proposed Taxonomy Of Management Systems', *Systems Research and Behavioral Science*, vol. 20, no. 1, pp. 21 - 29.
- Floyd, S. W. and Wooldridge, B. 1990, 'Path Analysis Of The Relationship Between Competitive Strategy, Information Technology, And Financial Performance', *Journal of Management Information Systems*, vol. 7, no. 1, pp. 48-64.

- Font, F. B. 1993, 'Retail Banking In Spain: Recent Changes And Their Effect On The Content And Culture Of Front-Desk Jobs', *The International Journal of Bank Marketing*, vol. 11, no. 1.
- Frandsberg, T. 1999, 'Experiences Of Applying General Living Systems Theory', *Systems Research and Behavioral Science*, vol. 16, no. 1.
- Freeman, R. 1984, *Strategic Management: A Stakeholder Approach*, Ballinger, Boston, MA.
- Frei, F. X., Harker, P. T. and Hunter, L. W. 2000, 'Inside The Black Box: What Makes A Bank Efficient?', in *Performance Of Financial Institutions: Efficiency, Innovation, Regulation*, eds. Harker, P. T. and Zenios, S. A., Cambridge University Press, New York, pp. 259-311.
- Frenzel, C. W. 1992, *Management Of Information Technology*, Boyd And Fraser, Boston, Ma.
- Gable, G. G. 1994, 'Integrating Case Study And Survey Research Methods: An Example In Information Systems', *European Journal Of Information Systems*, vol. 3, no. 2, pp. 112-126.
- Galliers, R. D. 1990, 'Choosing Appropriate Information Systems Research Approaches: A Revised Taxonomy', in *IFIP TC8/WG 8.2 Working Conference On The Information Systems Research Arena Of The 90's: Challenges, Perceptions And Alternative Approaches*, eds. Nissen, H. E., Klein, H. K. and Hirscheim, R., Elsevier Science, Copenhagen, Denmark.
- Galliers, R. D. and Baker, B. S. H. 1994, *Strategic Information Management: Challenges And Strategies In Managing Information Systems*, Butterworth-Heinemann, Oxford, England.
- Galliers, R. D. and Sutherland, A. R. 1991, 'Information Systems Management and Strategy formulation: The "Stages of Growth" model revisited', *Journal Of Information Systems*, no. 1, pp. 89 - 114.
- Ghobadian, A., Speller, S. and Jones, M. 1994, 'Service Quality - Concepts And Models', *The International Journal Of Quality And Reliability Management*, vol. 11, no. 9.

- Gizycki, M. and Lowe, P. 2000, 'The Australian Financial System in the 1990s', in *Reserve Bank Of Australia 2000 Conference: The Australian Economy in the 1990s*, eds. Gruen, D. and Shrestha, S., Reserve Bank Of Australia, H.C. Coombs Centre for Financial Studies, Kirribilli.
- Glaser, B. and Strauss, A. 1967, *The Discovery Of Grounded Theory*, Aldine, Chicago.
- Gregor, S. 2002, 'A Theory Of Theories In Information Systems', in *Information Systems Foundations: Building The Theoretical Base Workshop*, eds. Gregor, S. and Hart, D., School Of Business And Information Management, Australia National University, Australia National University, Canberra.
- Gregor, S. and Hart, D. (eds.) 2002, *Information Systems Foundations: Building The Theoretical Base*, School Of Business And Information Management, Australia National University, Canberra.
- Griffin, J. J. 1998, 'Using Technology To Understand Stakeholders', *Business And Society*, vol. 37, no. 1.
- Grover, V., Lee, C. C. and Durand, D. 1993, 'Analysing Methodological Rigor Of MIS Survey Research From 1980 - 1989', *Information and Management*, vol. 24, pp. 305-317.
- Grover, V., Teng, J. T. C. and Fiedler, K. D. 1998, 'IS Investment Priorities In Contemporary Organisations', *Communications Of The ACM*, vol. 41, no. 2, pp. 40 - 48.
- Guba, E. G. and Lincoln, Y. S. 1994, 'Competing Paradigms In Qualitative Research', in *Handbook Of Qualitative Research*, eds. Denzin, N. S. and Lincoln, Y. S., Sage Publications, Thousand Island, pp. 105 - 117.
- Gurbaxani, V., Kraemer, K. L. and Vitalari, N. 1997, 'Note: An Economic Analysis Of IS Budgets', *Management Science*, vol. 43, no. 12, pp. 1745 - 1755.
- Gurbaxani, V., Melville, N. and Kraemer, K. L. 2000, 'The Production Function Of Information Systems: A Firm-Level Analysis Of Information Systems Budgets', *Information Systems Research*, vol. 11, no. 2, pp. 159 - 176.
- Hammer, M. and Champy, J. 1993, *Re-engineering The Corporation*, Nicholas Brealey Publishing Ltd, London, Great Britain.

- Harker, P. T. and Zenios, S. A. (eds.) 2000a, *Performance Of Financial Institutions: Efficiency, Innovation, Regulation*, Cambridge University Press, New York.
- Harker, P. T. and Zenios, S. A. 2000b, 'What Drives The Performance Of Financial Institutions?', in *Performance Of Financial Institutions: Efficiency, Innovation, Regulation*, eds. Harker, P. T. and Zenios, S. A., Cambridge University Press, New York, pp. 3-31.
- Harper, I. R. 2000, 'Mergers In Financial Services: Why The Rush', *The Australian Economic Review*, vol. 33, no. 1, pp. 67 - 72.
- Harris, S. E. and Katz, J. L. 1988, 'Profitability And Information Technology Capital Intensity In The Insurance Industry', in *Proceedings Of The 21st Annual Hawaii International Conference on Systems Sciences*, Cambridge University Press, New York, pp. 124-130.
- Harris, S. E. and Katz, J. L. 1989, 'Predicting Organisational Performance Using Information Technology Managerial Control Ratios', in *Proceedings Of The 22nd Annual Hawaii International Conference on Systems Sciences*, Cambridge University Press, New York, pp. 197-204.
- Harris, S. E. and Katz, J. L. 1991, 'Firm Size And The Information Technology Investment Intensity Of Life Insurers', *MIS Quarterly*, pp. 332-352.
- Henderson, J. C. 1990, 'Plugging Into Strategic Partnerships: The Critical IS Connection', *Sloan Management Review*, no. Spring 1990, pp. 7 - 18.
- Henderson, J. C. and Venkatraman, N. 1993, 'Strategic Alignment: Leveraging Information Technology For Transforming Organisations', *IBM Systems Journal*, no. 32, pp. 4 - 16.
- Hirscheim, R. 2002, 'Rigor In Qualitative Data Analysis - The Case Of Strategic Alignment Of The IS Function', pp. 1 - 24.
- Hirscheim, R. and Smithson, S. 1999, 'Evaluation Of Information Systems: A Critical Assessment', in *Beyond The IT Productivity Paradox*, eds. Willcocks, L. and Lester, S., John Wiley and Sons Ltd, Baffins Lane, Chichester, pp. 381 - 409.



- Hitt, L. and Brynjolfsson, E. 1996, 'Productivity, Business Profitability And Consumer Surplus: Three Measures Of Information Technology Value', *MIS Quarterly*, pp. 121 - 142.
- Hochstrasser, B. and Griffiths, C. 1991, *Controlling IT Investment*, Chapman And Hall, London.
- Holland, C. P. and Westwood, J. B. 2001, 'Product-Market And Technology Strategies In Banking', *Communications Of The ACM*, vol. 44, no. 6, pp. 53 - 57.
- Horvitz, P. M. and White, L. J. 2000, 'The Challenges Of The New Electronic Technologies In Banking: Private Strategies and Public Policies', in *Performance of Financial Institutions: Efficiency, Innovation, Regulation*, eds. Harker, P. T. and Zenios, S. A., Cambridge University Press, New York, pp. 367-387.
- Hunter, L. W. and Hitt, L. 1997, 'Technology, Human Resources And Productivity In Bank Branches', *Working Paper, Wharton Financial Institutions Center, The Wharton School (Philadelphia, PA)*.
- Idris, F., Abdullah, M., Idris, M. A. and Hussain, N. 2003, 'Integrating Resource Based View And Stakeholder Theory In Developing The Malaysian Excellence Model: A Conceptual Framework', *Singapore Management Review*, vol. 25, no. 2, pp. 91 - 109.
- Im, K. S., Dow, K. E. and Grover, V. 2001, 'Research Report: A Re-examination Of IT Investment And The Market Value Of The Firm- An Event Study Methodology', *Information Systems Research*, vol. 12, no. 1, pp. 103-117.
- Ives, B. and Learmonth, G. P. 1984, 'The Information System As A Competitive Weapon', *Communications Of The ACM*, no. December, pp. 1193 - 1204.
- Jasimuddin, S. M. 2001, 'Analysing The Competitive Advantage Of Saudi Arabia With Porter's Model', *The Journal Of Business and Industrial Marketing*, vol. 16, no. 1.
- Jawahar, I. M. and McLaughlin, G. L. 2001, 'Towards A Descriptive Stakeholder Theory: An Organisational Life Cycle Approach', *Academy Of Management Review: The Academy Of Management Review*, vol. 26, no. 3, pp. 397 - 414.

- Jayawardhena, C. and Foley, P. 2000, 'Changes in the banking sector - the case of Internet banking in the UK', *Internet Research*, vol. 10, no. 1.
- Johnston, R. 1997, 'Identifying The Critical Determinants Of Service Quality In Retail Banking: Importance And Effect', *The International Journal Of Bank Marketing*, vol. 15, no. 4.
- Joseph, M. and Stone, G. 2003, ' An Empirical Evaluation Of US Bank Customer Perceptions Of The Impact Of Technology On Service Delivery In The Banking Sector', *International Journal of Retail And Distribution Management*, vol. 31, no. 4/5.
- Jurison, J. 1996, 'Toward More Effective Management Of Information Technology Benefits', *Journal of Strategic Information Systems*, no. 5, pp. 263 - 274.
- Kaplan, B. and Duchon, D. 1988, 'Combining Qualitative and Quantitative Methods In Information Systems Research', *MIS Quarterly*, pp. 571-586.
- Kauffman, R. J. and Weill, P. 1989, 'An Evaluative Framework For Research On The Performance Effects Of Information Technology Investment', in *Proceedings Of The Tenth International Conference On Information Systems, Boston MA*, Butterworth-Heinemann, 313 Washington St, Newton, MA, Newton, MA, pp. 377-388.
- Key, S. 1999, 'Toward A new Theory Of The Firm: A Critique Of Stakeholder "Theory"', *Management Decision*, vol. 37, no. 4.
- Khandelwal, V. K. 2001, 'An Empirical Study Of Misalignment Between Australian CEOs And IT Managers', *Journal Of Strategic Information Systems*, vol. 10, pp. 15 - 28.
- Kiesnoski, K. 1999, 'Cyberbanks: Carving A Market Niche?', In *Bank Systems And Technology*, vol. 36.
- King, W. R., Grover, V. and Hufnagel, E. H. 1989, 'Using Information Technology For Sustainable Competitive Advantage: Some Empirical Evidence', *Information and Management*, no. 17, pp. 87 - 93.
- King, W. R. and Sabherwal, R. 1992, 'The Factors Affecting Strategic Information Systems Applications', *Information And Management*, no. 23, pp. 217 - 235.

- Kivijarvi, H. and Saarinen, T. 1995, 'Investment In Information Systems And Financial Performance Of The Firm', *Information And Management*, no. 28, pp. 143 - 163.
- Klein, H. K. and Myers, M. D. 1999, 'A Set Of Principles For Conducting And Evaluating Interpretive Field Studies In Information Systems', *MIS Quarterly*, vol. 23, no. 1, pp. 67 - 94.
- Kling, J. A. and Smith, K. A. 1995, 'Identifying Strategic Groups In The U.S Airline Industry: An Application Of Porter's Model', *Transportation Journal*, vol. 35, no. 2.
- Kohli, R. and Devaraj, S. 2003, 'Measuring Information Technology Payoff: A Meta-Analysis Of Structural Variables In Firm Level Empirical Research', *Information Systems Research*, vol. 14, no. 2, pp. 127 - 145.
- Korac-Kakabadse, N. and Kakabadse, A. 2001, 'IS/IT Governance: Need For An Integrated Model', *Corporate Governance*, vol. 1, no. 4.
- Kremar, H. and Lucas Jr., H. C. 1991, 'Success Factors For Strategic Information Systems'.
- Krishnan, M. S., Ramaswamy, V., Meyer, M. C. and Damien, P. 1999, 'Customer Satisfaction For Financial Services: The Role Of Products, Services and Information Technology', *Management Science*, vol. 45, no. 9, pp. 1194 - 1209.
- Kydd, C. T. and Jones, L. H. 1989, 'Corporate Productivity And Shared Information Technology', *Information and Management*, no. 17, pp. 277 - 282.
- Lacity, M. C. and Janson, M. A. 1994, 'Understanding Qualitative Data: A Framework Of Text Analysis Methods', *Journal of Management Information Systems*, vol. 11, no. 2, pp. 137-155.
- Lai, V. S. and Mahapatra, R. K. 1997, 'Exploring The Research In Information Technology Implementation', *Information and Management*, vol. 32, pp. 187-201.
- Larkin, W. J. and Casscles, J. S. 2003, 'How The Recent Corporate Governance And Financial Scandals May Affect The Debate On The Future Of State Regulation Of Insurance', *Journal Of Insurance Regulation*, vol. 21, no. 4.

- Lederer, A. L. and Sethi, V. 1988, 'The Implementation Of Strategic Information Systems Planning Methodologies', *MIS Quarterly*, vol. 12, no. 3, pp. 445 - 461.
- Lee, A. S. 1991, 'Integrating Positivist And Interpretive Approaches To Organisational Research', *Organisation Science*, vol. 2, no. 4, pp. 342 - 365.
- Lee, M. C. S. and Adams, D. A. 1990, 'A Manager's Guide To The Strategic Potential Of Information Systems', *Information and Management*, no. 19, pp. 169 - 182.
- Lee, Z., Gosain, S. and Im, I. 1999, 'Topics Of Interest In IS: Evolution Of Themes And Differences Between Research And Practice', *Information and Management*, vol. 36, pp. 233-246.
- Leibenstein, H. 1966, 'Allocative Efficiency versus 'X-Efficiency'', *American Economic Review*, vol. 56, pp. 392-415.
- Leibenstein, H. 1980, 'X-efficiency, Intrafirm Behaviour and Growth', in *Lagging Productivity Growth*, eds. Maital, S. and Meltz, N., Bollinger Publishing, Cambridge, MA, pp. 199-220.
- Li, M. and Ye, R. 1999, 'Information Technology And Firm Performance: Linking With Environmental, Strategic And Managerial Contexts', *Information And Management*, no. 35, pp. 43 - 51.
- Lilja, P. 1999, 'Structural Changes In The Banking Sector- Driving Forces And Consequences', *Quarterly review - Sveriges Riksbank*, no. 4, pp. 43-63.
- Lin, C. and Pervan, G. 2002, 'Research on IS/IT Investment Evaluation and Benefits Realisation in Australia', in *Information Systems Evaluation Management*, ed. Van Grembergen, W., Idea Group Publishing, Hershey, USA.
- Lintern, L. 1996, 'Universal Credit Union - The Birth Of A Movement', In *Australian Credit Unions Magazine*, pp. 9 - 11.
- Llewellyn, D. T. 1996, 'Banking in the 21st Century: The Transformation of an Industry', in *Reserve Bank Of Australia Conference, 1996: The Future Of The Financial System*, ed. Edey, M., Reserve Bank Of Australia, The H.C. Coombs Centre for Financial Studies, Kirribilli.

- Long, T. 1966, *History And Principles Of Credit Unions*, Y.C.W Co-Operative Society.
- Lopez, V. A. 2001, 'An Overview Of The Resource Based View Of The Firm, Drawing On Recent Spanish Management Research', *Irish Journal Of Management*, vol. 22, no. 2, pp. 105 - 120.
- Loveman, G. 1988, 'An Assessment Of The Productivity Impact Of Information Technologies', *Management In The 1990s (Sloan School Of Management, MIT, Working Paper)*.
- Lucas, H. C. 1975a, 'Performance And The Use Of An Information System', *Management Science*, vol. 21, no. 8, pp. 908-919.
- Lucas, H. C. 1975b, 'The Use Of An Accounting Information System, Action and Organisational Performance', *The Accounting Review*, pp. 735-746.
- Lucas, H. C. 1993, 'The Business Value Of Information Technology: A Historical Perspective And Thoughts For Future Research', in *Strategic Information Technology Management: Perspectives On Organisational Growth And Competitive Advantage*, eds. Banker, R. D., Kauffman, R. J. and Mahmood, M. A., Idea Group Publishing, Harrisburg, PA, pp. 359-374.
- Mahmood, M. A. 1994, 'Evaluating Organisational Efficiency Resulting from Information Technology Investment: An Application Of Data Envelopment Analysis', *Journal Of Information Systems*, no. 4, pp. 93 - 115.
- Mahmood, M. A. and Mann, G. J. 1993, 'Measuring The Organisational Impact Of Technology Investment: An Exploratory Study', *Journal of Management Information Systems*, vol. 10, no. 1, pp. 97 - 122.
- Markus, L. M. and Soh, C. 1993, 'Banking On Information Technology: Converting IT Spending Into Firm Performance', in *Strategic Information Technology Management: Perspectives On Organisational Growth and Competitive Advantage*, eds. Banker, R. D., Kauffman, R. J. and Mahmood, M. A., Idea Group Publishing, Harrisburg, PA, pp. 375 - 403.
- Mason, R. O., Mckenney, J. L. and Copeland, D. 1997, 'Developing An Historical Tradition In MIS Research', *MIS Quarterly*, pp. 257 - 278.

- Mayfield, M., Mayfield, J. and Lunce, S. 2003, 'Human Resource Information Systems: A Review And Model Development', *Advances in Competitiveness Research*, vol. 11, no. 1, pp. 139 - 151.
- Mcfarlan, F. W. 1984, 'Information Technology Changes The Way You Compete', *Harvard Business Review*, vol. May-June 1984.
- Mckeen, J. D. and Smith, H. A. 1993a, 'Linking Investment With IT Usage'.
- Mckeen, J. D. and Smith, H. A. 1993b, 'The Relationship Between Information Technology Use And Organisational Performance', in *Strategic Information Technology Management: Perspectives On Organisational Growth and Competitive Advantage*, eds. Banker, R. D., Kauffman, R. J. and Mahmood, M. A., Idea Group Publishing, Harrisburg, PA.
- Mckeen, J. D. and Smith, H. A. 1996, *Management Challenges In IS: Successful Strategies And Appropriate Action*, John Wiley And Sons, Baffins Lane, Chichester.
- McKeown, P. G. 2001, *Information Technology And The Networked Economy*, Harcourt College Publishers, Fort Worth, Texas.
- Menon, N. M., Lee, B. and Eldenburg, L. 2000, 'Productivity Of Information Systems In the Healthcare Industry', *Information Systems Research*, vol. 11, no. 1, pp. 83 - 92.
- Mikko, R. 1991, 'Stakeholders Of Strategic Information Systems Planning: theoretical Concepts And Emprical Examples', *Journal Of Strategic Information Systems*, vol. 1, no. 1, pp. 15 - 28.
- Miles, M. B. and Huberman, A. M. 1994, *Qualitative Data Analysis: An Expanded Source Book*, 2nd edn, Sage Publications Inc., California.
- Miller, A. and Dess, G. G. 1993, 'Assessing Porter's (1980) Model In Terms Of Its Generalisability, Accuracy And Simplicity', *Journal Of Management Studies*, vol. 30, no. 4, pp. 553 - 585.
- Miller, J. 1993, 'Measuring And Aligning Information Systems With The Organisation', *Information and Management*, no. 25, pp. 217 - 228.

- Miller, J. and Doyle, B. A. 1987, 'Measuring The Effectiveness Of Computer Based Information Systems In The Financial Services Sector', *MIS Quarterly*, pp. 106 - 124.
- Mills, G. 2002, 'Paying with Plastic: The Digital Revolution in Buying and Borrowing', *Economic Record*, vol. 78, no. 240.
- Mingers, J. 2001, 'Combining IS Research Methods: Towards Pluralist Methodology', *Information Systems Research*, vol. 12, no. 3, pp. 240 - 259.
- Mintzberg, H. 1980, 'Structure In 5's: A Synthesis of The Research On Organisation Design', *Management Science*, vol. 26, no. 3, pp. 322 - 341.
- Mintzberg, H. 2002, 'Researching The Researching Of Walking', *Journal Of Management Inquiry*, vol. 11, no. 4.
- Mintzberg, H. and Quinn, J. B. 1996, *The Strategy Process: Concepts, Contexts, Cases*, 3rd edn, Prentice Hall, 1996, Upper Saddle River, N.J.
- Mishkin, F. S. 2001, 'Prudential Supervision: Why Is It Important And What Are The Issues?', in *Prudential Supervision: What Works And What Doesn't*, ed. Mishkin, F. S., The University Of Chicago Press, London.
- Munk, W. P. and Shane, B. 1994, 'Using Competitive Analysis Models To Set Strategy In The Northwest Hardboard Industry', *Forrest Products Journal*, vol. 44, no. 7/8, pp. 11 - 19.
- Mylonopoulos, N. A. and Theoharakis, V. 2001, 'Global Perceptions Of Information Systems Journals', *Communications Of The ACM*, vol. 44, no. 9, pp. 29 - 33.
- Nandhakumar, J. and Jones, M. 1997, 'Too Close For Comfort? Distance And Engagement In Interpretive Information Systems Research', *Information Systems Journal*, no. 7, pp. 109 - 131.
- Narayanan, V. K. 2001, *Managing Technology And Information For Competitive Advantage*, Prentice Hall, Upper Saddle River, New Jersey 07458.
- Navarrete, C. J. and Pick, J. B. 2002, 'Information Technology Expenditure And Industry Performance: The Case Of the Mexican Banking Industry', *Journal of Global Information Technology Management*, vol. 5, no. 2, pp. 7 - 28.

- Neuman, W. L. 2000, *Social Research Methods: Qualitative And Quantitative Approaches*, 4 edn, Allyn And Bacon, Boston, MA.
- Orlikowski, W. and Baroudi, J. J. 1991, 'Studying Information Technology In Organisations: Research Approaches And Assumptions', *Information Systems Research*, vol. 2, no. 1, pp. 1-29.
- Palmer, J. and Markus, L. M. 2000, 'The Performance Impacts Of Quick Response Strategic Alignment In Specialty Retailing', *Information Systems Research*, vol. 11, no. 3, pp. 241 - 259.
- Panko, R. R. 1991, 'Is Office Productivity Stagnant?', *MIS Quarterly*, pp. 191 - 203.
- Parasuraman, A., Zeithaml, V. A. and Berry, L. L. 1985, 'A Conceptual Model Of Service Quality And Its Implications For Future Research', *Journal Of Marketing*, vol. 49, pp. 41 - 50.
- Parasuraman, A., Zeithaml, V. A. and Berry, L. L. 1988, 'SERVQUAL A Multiple-Item Scale For Measuring Consumer Perceptions Of Quality', *Journal Of Retailing*, vol. 64, pp. 12 - 40.
- Pare, G. 2001, *Using A Positivist Case Study Methodology To Build And Test Theories In Information Systems: Illustrations From Four Exemplary Studies*, Ecole Des Hautes Etudes Commerciales De Montreal, Montreal.
- Pare, G. and Elam, J. J. 1997, 'Using Case Study Research To Build Theories Of IT Implementation', in *Information Systems And Qualitative Research: Proceedings Of The IFIP TC8 WG 8.2 Conference On Information Systems And Qualitative Research*, Philadelphia, Pennsylvania, pp. 542-569.
- PC1 2001a, *Concise Annual Report 2001*, PC1.
- PC1 2001b, *Full Annual Report 2001*, PC1.
- Pearlson, K. E. 2001, *Managing And Using Information Systems: A Strategic Approach*, John Wiley and Sons Inc., New York.
- Pearlson, K. E. and Saunders, C. S. 2004, *Managing And Using Information Systems: A Strategic Approach*, 2nd edn, John Wiley And Sons Inc.



- Peppard, J. 2001, 'Bridging The Gap Between The IS Organisation And The Rest Of The Business: Plotting a Route', *Journal Of Information Systems*, no. 11, pp. 249 - 270.
- Peppard, J. and Ward, J. 1999, 'Mind The Gap': Diagnosing The Relationship Between The IT Organisation And The Rest Of The Business', *Journal of Strategic Information Systems*, no. 8, pp. 29 - 60.
- Pervan, G. 1994a, 'A Case for More Case Study Research In Group Support Systems', in *Proceedings Of The IFIP TC8 Open Conference On Business Process Re-engineering: Information Systems Opportunities and Challenges, Gold Coast Queensland Australia*, Monash University, Melbourne, pp. 485-495.
- Pervan, G. 1994b, 'The Measurement Of GSS Effectiveness: A Meta-Analysis Of The Literature And Recommendations For Future GSS Research', in *Proceedings Of The Twenty Seventh Annual Hawaii International Conference on Systems Sciences*, Monash University, Melbourne, pp. 562-571.
- Pervan, G. 1997, 'Information Systems Management: An Australasian View Of The Key Issues- 1996', *Australian Journal Of Information Systems*, vol. 4.
- Pitt, L. F., Watson, R. T. and Kavan, B. C. 1995, 'Service Quality: A Measure Of Information Systems Effectiveness', *MIS Quarterly*, pp. 173-187.
- Porter, M. E. 1979, 'Forces Governing Competition In Industry', *Harvard Business Review*, no. Mar/Apr.
- Porter, M. E. 1980, *Competitive Strategy*, Free Press, New York.
- Porter, M. E. 1985, *Competitive Advantage*, Free Press, New York.
- Porter, M. E. 1990, *The Competitive Advantage Of Nations*, The Free Press, New York, N.Y.
- Porter, M. E. and Millar, V. E. 1985, 'How Information Gives You Competitive Advantage', *Harvard Business Review*, vol. 63, no. July - August, pp. 149 - 160.
- Powell, P. 1992, 'Information Technology Evaluation: Is It Different?', *The Journal Of The Operational Research Society*, vol. 43, no. 1, pp. 29-43.

- Powell, T. C. and Dent-Micallef, A. 1997, 'Information Technology As Competitive Advantage: The Role Of Human, Business, And Technology Resources', *Strategic Management Journal*, vol. 18, no. 5, pp. 375-405.
- Prasad, B. and Harker, P. T. 1997, 'Examining The Contribution Of Information Technology Toward Productivity And Profitability In U.S Retail Banking', *Working Paper, Wharton Financial Institutions Center, The Wharton School (Philadelphia, PA)*.
- Preece, D. 1995, *Organisations And Technical Change: Strategy, Objectives And Involvement*, Routledge, London.
- Prendergast, G. P. 1993, 'Self-service technologies in retail banking: Current and expected adoption patterns', *The International Journal of Bank Marketing*, vol. 11, no. 7.
- Raghunathan, T. S. and Raghunathan, B. 1993, 'Does The Reporting Level Of Information Systems Executives Make A Difference', *Journal Of Strategic Information Systems*, vol. 2, no. 1, pp. 27 - 38.
- Ramani, K. V. and Pavri, F. 1994, 'IT Supports Business Strategy Growth At The Development Bank Of Singapore', *Journal of Strategic Information Systems*, vol. 3, no. 4, pp. 327 - 337.
- Raymond, L., Pare, G. and Bergeron, F. 1995, 'Matching Information Technology And Organisational Structure: An Empirical Study With Implications For Performance', *European Journal Of Information Systems*, vol. 4, pp. 3 - 16.
- RBA 2000, *Council Of Financial Regulators: Annual Report 2000*, Reserve Bank Of Australia.
- Renkema, T. J. W. and Berghout, E. W. 1997, 'Methodologies For Information Systems Investment Evaluation At The Proposal Stage: A Comparative Review', *Information And Software Technology*, no. 39, pp. 1-13.
- Rex, E. P. 1999, 'Resource View Theory Analysis Of SAP As A Source Of Competitive Advantage', *Database For Advances In Information Systems*, vol. 30, no. 1, pp. 38 - 46.
- Reynolds, M. and Ochalla, B. 2003, 'Australians Say They Are More Satisfied With Credit Unions Than Banks', *Credit Union Management*, vol. 26, no. 1.

- Roach, S. S. 1988, 'Technology And The Service Sector: The Hidden Competitive Challenge', *Technological Forecasting And Social Change*, vol. 34, no. 4, pp. 387-403.
- Robbins, S. P. 1987, *Organisation Theory: Structure, Design And Applications*, 2nd edn, Prentice-Hall, Englewood Cliffs.
- Robledo, M. A. 2001, 'Measuring And Managing Service Quality: Intergrating Customer Expectations', *Managing Service Quality*, vol. 11, no. 1, pp. 22 - 31.
- Robson, W. 1997, *Strategic Management And Information Systems*, 2nd edn, Pitman Publishing, London.
- Rockart, J. F. 1982, 'The Role Of The Information Systems Executive: A Critical Success Factor Perspective', *Sloan Management Review*, vol. 24, no. 1, pp. 3 - 13.
- Rowley, T. 1998, 'A Normative Justification For Stakeholder Theory', *Business And Society*, vol. 37, no. 1, pp. 105 - 107.
- Ryan, U., Pitts, E. and Lenihan, H. 1998, 'International Competitiveness Of The Irish Shellfish Processing Industry: An Adapted Porterian Analysis', *Irish Journal Of Management*, vol. 19/20, no. 1.
- Sager, M. T. 1988, 'Competitive Information Systems In Australian Banking', *Information and Management*, no. 15, pp. 59 - 67.
- Sambamurthy, V. and Zmud, R. 1999, 'Arrangements for Information Technology Governance: A Theory Of Multiple Contingencies', *MIS Quarterly*, vol. 23, no. 2, p. 261 (30pages).
- Saunders, C. S. and Jones, J. W. 1992, 'Measuring Performance Of The Information Systems Function', *Journal of Management Information Systems*, vol. 8, no. 4, pp. 63 - 82.
- Scudder, R. A. and Kucic, A. R. 1991, 'Productivity Measures For Information Systems', *Information and Management*, no. 20, pp. 343 - 354.

- Seddon, P. 1997, 'A Respecification And Extension Of The DeLone And McLean Model Of IS Success', *Information Systems Research*, vol. 8, no. 3, pp. 240-253.
- Seddon, P., Graeser, V. and Willcocks, L. 2002, 'Measuring Organisational IS Effectiveness: An Overview and Update Of Senior Management Perspectives', *Database For Advances In Information Systems*, vol. 33, no. 2, pp. 11 - 28.
- Segars, A. H., Grover, V. and Kettinger, W. J. 1994, 'Strategic Users Of Information Technology: A longitudinal Analysis Of Organisational Strategy And Performance', *Journal of Strategic Information Systems*, vol. 3, no. 4, pp. 261 - 288.
- Sekaran, U. 1992, *Research Methods For Business: A Skill Building Approach*, 2nd edn, John Wiley And Sons, New York.
- Sekaran, U. 2000, *Research Methods For Business: A Skill Building Approach*, 3rd edn, John Wiley And Sons Inc.
- Sethi, V., Hwang, K. T. and Pegels, C. 1993, 'Information Technology And Organisational Performance', *Information and Management*, no. 25, pp. 193-205.
- Shanks, G. 2002, 'Issues In Positivist, Single Case Study Research In Information Systems', in *Information Systems Foundations: Building The Theoretical Base Workshop*, eds. Gregor, S. and Hart, D., School Of Business And Information Management, Australia National University, Australia National University, Canberra.
- Shih, G. and Shim, S. S. Y. 2002, 'A Service Management Framework for M-Commerce Applications', *Mobile Networks and Applications*, vol. 7, no. 3.
- Shin, N. 2001, 'The Impact Of Technology On Financial Performance: The Importance Of Strategic Choice', *European Journal Of Information Systems*, no. 10, pp. 227 - 236.
- Siewewright, M. 2002, 'Traditional Vs. Virtual Service', In *Credit Union Magazine*, vol. 68.

- Silk, D. J. 1990, 'Managing IS Benefits For The 1990s', *Journal Of Information Technology*, no. 5, pp. 185 - 193.
- Sircar, S., Turnbow, J. L. and Bordoloi, B. 2000, 'A Framework For Assessing The Relationship Between Information Technology Investments And Firm Performance', *Journal of Management Information Systems*, vol. 16, no. 4, pp. 69 - 97.
- Skok, W., Kophamel, A. and Richardson, I. 2001, 'Diagnosing Information Systems Success: Importance-Performance Maps In The Health Club Industry', *Information And Management*, no. 38, pp. 409 - 419.
- Slevin, D. P., Stieman, P. A. and Boone, L., W. 1991, 'Critical Success Factor Analysis For Information Systems Performance Measurement And Enhancement', *Information and Management*, no. 21, pp. 161 - 174.
- Smithson, S. 1991, 'Combining Different Research Approaches: Discussant's Comments', in *Information Systems Research: Contemporary Approaches And Emergent Traditions*, eds. Nissen, H. E., Klein, H. K. and Hirscheim, R., Elsevier Science, Copenhagen.
- Soanes, C. (ed.) 2000, *The Oxford Compact English Dictionary*, 2nd edn, Oxford University Press, Great Clarendon St, Oxford.
- Sohal, A. S. and Ng, L. 1998, 'The Role And Impact Of Information Technology In Australian Business', *Journal of Information Technology*, no. 13, pp. 201-217.
- Sriram, R. S. 2003, 'The Value Of IT Investments On Firm Value In The Financial Services Sector', *Information Resources Management Journal*, vol. 16, no. 1, pp. 46 - 61.
- Stacey, R. D. 1993, *Strategic Management And Organisational Dynamics*, Pitman Publishing, London.
- Stratopoulos, T. and Dehning, B. 2000, 'Does Successful Investment In Information Technology Solve The Productivity Paradox', *Information And Management*, no. 38, pp. 103 - 117.

- Symons, V. J. 1991, 'A Review Of Information Systems Evaluation: Content, Context And Process', *European Journal Of Information Systems*, vol. 1, no. 3, pp. 205 - 212.
- Szewczak, E. J., Snodgrass, C. and Khosrowpour, M. 1991, *Management Impacts Of Information Technology: Perspectives In Organisational Change*, Idea Group Publishing, Harrisburg, Pennsylvania.
- Tallon, P. P., Kraemer, K. L. and Gurbaxani, V. 2000, 'Executives Perceptions Of The Business Value Of Information Technology: A Process Oriented Approach', *Journal of Management Information Systems*, vol. 16, no. 4, pp. 145 - 173.
- Tam, K. Y. 1992, 'Capital budgeting In Information Systems Development', *Information And Management*, no. 23, pp. 345 - 357.
- Tam, K. Y. 1998, 'The Impact Of Information Technology Investments On Firm Performance And Evaluation: Evidence From Newly Industrialised Economies', *Information Systems Research*, vol. 9, no. 1, pp. 85-98.
- Tan, B. W. and Lo, T. W. 1990, 'Validation Of A User Satisfaction Instrument For Office Automation Success', *Information and Management*, no. 18, pp. 203 - 208.
- Teas, K. R. 1993, 'Expectations Performance, Evaluation And Customers' Expectations', *Journal Of Marketing*, vol. 57, pp. 18 - 34.
- Thatcher, M. E. and Oliver, J. R. 2001, 'The Impact Of Technology Investments On A Firm's Production Efficiency, Product Quality And Productivity', *Journal of Management Information Systems*, vol. 18, no. 2, pp. 17 -45.
- Thompson, G. 1996, 'Regulatory Policy Issues in Australia', in *Reserve Bank Of Australia Conference, 1996: The Future Of The Financial System*, ed. Edey, M., Reserve Bank Of Australia, The H.C. Coombs Centre for Financial Studies, Kirribilli.
- Thornhill, A. 2003, 'Banking Costs Us More', In *The West Australian*, Perth, Western Australia.

- Trauth, E. M. 2001, 'The Pursuit Of Information Technology In Context', in *Australasian Conference On Information Systems*, eds. Finnie, G., Cecez-Kecmanovic, D. and Lo, B., Coff's Harbour, NSW, Australia.
- Trewin, D. 2000, *Finance Australia: 1999–2000*, Australian Bureau Of Statistics.
- Trice, A. W. and Treacy, M. E. 1986, 'Utilisation As A Dependent Variable In MIS Research', in *Proceedings Of The Seventh International Conference On Information Systems*.
- TSW 2003, *Co-processing Pty Ltd*, Available: [<http://www.copro.com.au/overview.html>] (29 May 2003).
- Turner, J. 1985, 'Organisational Performance, Size And The Use Of Data Processing Resources', *Center for Research In Information Systems, New York University (Working Paper #58)*.
- Turner, P. 1994, 'Japanese Financial Services Organisations: Contrasting Market Experiences Between 1985 And 1993', *The International Journal Of Bank Marketing*, vol. 12, no. 1.
- van Nievelt, A. M. C. 1999, 'Benchmarking Organisational Performance And IT', in *Beyond The IT Productivity Paradox*, eds. Willcocks, L. and Lester, S., John Wiley And Sons, Chichester, UK, pp. 99 - 119.
- Van Teijlingen, E. R. and Hundley, V. 2001, *The Importance Of Pilot Studies*, Available: [<http://www.soc.surrey.ac.uk/sru/SRU35.html>] (02/04/2004).
- Vital, R. and Aubert, B. 2002, 'A Resource Based Analysis Of IT Sourcing', *Database For Advances In Information Systems*, vol. 33, no. 2, pp. 29 - 40.
- Wallis, S., Beerworth, B., Harper, I. R., Carmichael, J. and Nicholls, L. 1997, *Financial System Inquiry Final Report*, Commonwealth Of Australia.
- Wang, T.-W. 2004, 'From General System Theory to Total Quality Management', *Journal of American Academy of Business*, vol. 4, no. 1/2, pp. 394 - 400.
- Ward, J., Griffiths, P. and Whitmore, P. 1990, *Strategic Planning For Information Systems*, John Wiley and Sons Ltd, West Sussex, England.

- Ward, J. and Peppard, J. 1996, 'Reconciling The IT/Business Relationship: A Troubled Marriage In Need Of Guidance', *Journal Of Strategic Information Systems*, vol. 5, pp. 37 - 65.
- Ward, J. and Peppard, J. 2002, *Strategic Planning For Information Systems*, 3rd edn, John Wiley And Sons, Chichester, England.
- Watson, R. T. 2001, 'Research In Information Systems: What We Haven't Learnt', In *MIS Quarterly*, vol. 25, ed. Lee, A. S., pp. v - xv.
- Weber, Y. and Pliskin, N. 1996, 'The Effects Of Information Systems Integration And Organisational Culture On A Firm's Effectiveness', *Information And Management*, no. 30, pp. 81 - 90.
- Webster, J. and Watson, R. T. 2002, 'Analysing The Past To Prepare For The Future: Writing A Literature Review', *MIS Quarterly*, vol. 26, no. 2, pp. xiii - xxiii.
- Weill, P. 1992, 'The Relationship Between Investment In Information Technology And Firm Performance: A Study Of The Valve Manufacturing Sector', *Information Systems Research*, vol. 3, no. 4, pp. 301-332.
- Weill, P. and Olson, M. H. 1989, 'Managing Investment In Information Technology: Mini Case Examples And Implications', *MIS Quarterly*, vol. 13, no. 1, pp. 3-17.
- Whittington, R. 1993, *What Is Strategy And Does It Matter?*, Routledge, London.
- Willcocks, L., Feeny, D. and Islei, G. 1997, *Managing IT As A Strategic Resource*, McGraw-Hill International (UK) Ltd, Berkshire, England.
- Willcocks, L. and Lester, S. 1999, *Beyond The Productivity Paradox*, John Wiley And Sons, Chichester, UK.
- Wilson, D. C. 1993, *A Strategy Of Change*, Routledge, London.
- Wiseman, C. and Macmillan, I. C. 1984, 'Creating Competitive Weapons From Information Systems', *The Journal Of Business Strategy*, no. Fall, pp. 42 - 49.
- Wood, J., Wallace, J., Zeffane, R. M., Chapman, J., Fromholtz, M., Morrison, V., Schermerhon, J. R., Hunt, J. G. and Osborn, R. N. 2004, *Organisational Behaviour: A Global Perspective*, 3rd edn, John Wiley and Sons, Milton, QLD.



- Yakhlef, A. 2001, 'Does The Internet Compete With Or Complement Bricks-And-Mortar Bank Branches?', *International Journal Of Retail And Distribution Management*, vol. 29, no. 6/7.
- Yin, R. K. 1994, *Case Study Research: Design and Methods*, 2nd edn, Sage Publications Inc, 2455 Teller Road, Thousand Oaks, California 91320.
- Zenios, C. V., Zenios, S. A., Agathocleous, K. and Soteriou, A. 1999, 'Benchmarks Of The Efficiency Of Bank Branches', *Interfaces*, vol. 29, no. 3, pp. 37 - 51.
- Zimmerman, W. 1988, *American Banker 1988 Managing Technology Survey: The Impact On The Bottom Line*, International Thompson Publishing Corporation, New York.

## **12.2 Publications Arising from This Research**

- Maimbo, H. 2001, 'Linking Information Systems And Technology Investments With Performance In Financial Institutions', in Western Australian Conference On Information Systems, University Of Western Australia.
- Maimbo, H. and Pervan, G. 2001, 'A Model Of IS/IT Investment And Organisational Performance In The Banking Industry Sector', in Twelfth Australasian Conference On Information Systems, eds. Finnie, G., Cecez-Kecmanovic, D. and Lo, B., School Of Multimedia And Information Technology, Southern Cross University, CHEC, Coffs Harbour, New South Wales, pp. 409 - 416.
- Maimbo, H. and Pervan, G. 2002, 'A Model Of IS/IT Investment in The Banking Industry', in Ninth European Conference On Information Technology Evaluation, eds. Brown, A. and Remenyi, D. S. J., Universite Paris - Dauphine, France, 15 - 16 July.
- Maimbo, H. and Pervan, G. 2003, 'IS/IT Investment And Organisational Performance In The Financial Services Sector: A Credit Union Case Study', in Proceedings Of The 7th Pacific Asia Conference On Information Systems, 10-13 July 2003, eds. Hanisch, J., Falconer, D., Horrocks, S. and Hillier, M., University of South Australia, Adelaide, South Australia.

### **12.3 Forthcoming Publications**

Maimbo, H. and Pervan, G. Forthcoming-a, 'A Credit Union Case Study On The Business Value Of IS/IT'.

Maimbo, H. and Pervan, G. Forthcoming-b, 'Designing a Case Study Protocol for application in IS research'.

Maimbo, H. and Pervan, G. Forthcoming-c, 'A Meta-analysis of the Literature on the Relationship Between IS Investment and Organisational Performance'.

### **12.4 Bibliography**

Adams, D. A., Nelson, R. R. and Todd, P. A. 1992, 'Perceived Usefulness, Ease of Use and Usage Of Information Technology: A Replication', *MIS Quarterly*, pp. 227-247.

Alloway, R. M. and Quillard, J. A. 1981, 'Top Priorities For The Information Systems Function', In *CISR Working Paper No 79*, Sloan School Of Management, Massachusetts Institute Of Technology, Cambridge, Massachusetts.

Apte, U. M. and Vepsalainen, A. P. J. 1993, 'High Tech or High Touch? Efficient Channel Strategies for Delivering Financial Services', *Journal Of Strategic Information Systems*, vol. 2, no. 1, pp. 39 - 54.

Arribas, E. H. and Inchusta, P. J. S. 1999, 'Evaluation Models Of Information Technology In Spanish Companies: A Cluster Analysis', *Information And Management*, no. 36, pp. 151 - 164.

Balasubramanian, P., Kulatilaka, N. and Storck, J. 2000, 'Managing Information Technology Investments Using A Real Options Approach', *Journal Of Strategic Information Systems*, vol. 9, pp. 39 - 62.

Ball, L. and Harris, R. 1982, 'SMIS Members: A Membership Analysis', *MIS Quarterly*, vol. 6, no. 1, pp. 19 -38.

- Banker, R. D., Kauffman, R. J. and Mahmood, M. A. (eds.) 1993, *Strategic Information Technology Management: Perspectives On Organisational Growth and Competitive Advantage*, Idea Group Publishing, Harrisburg, PA.
- Barney, J. B. 1986, 'Strategic Factor Markets: Expectations, Luck And Business Strategy', *Management Science*, no. 32, pp. 1231 - 1241.
- Barua, A., Kriebel, C. and Mukhopadhyay, T. 1995, 'Information Technologies And Business Value: An Analytic And Empirical Investigation', *Information Systems Research*, vol. 6, no. 1, pp. 3 - 23.
- Bharadwaj, A. S., Bharadwaj, S. G. and Konsynski, B. R. 1999, 'Information Technology Effects On Firm Performance As Measured By Tobin's q', *Management Science*, vol. 45, no. 6, pp. 1008 - 1024.
- Broderick, A. J. and Vachirapornpuk, S. 2002, 'Service quality in Internet banking: The importance of customer role', *Marketing Intelligence and Planning*, vol. 20, no. 6.
- Brown, R. M., Gatian, A. W. and Hicks Jr, J. O. 1995, 'Strategic Information Systems And Financial Performance', *Journal of Management Information Systems*, vol. 11, no. 4, pp. 215 - 248.
- Brynjolfsson, E. 1994, 'Information Assets, Technology And Organisation', *Management Science*, vol. 40, no. 12, pp. 1645 - 1662.
- Brynjolfsson, E. and Hitt, L. 1993, 'Is Information Systems Spending Productive? New Evidence And New Results', Working Paper, Coordination Laboratory, Massachusetts Institute Of Technology.
- Bysinger, B. and Knight, K. 1996, *Investing In Information Technology: A Decision Making Guide For Business And Technology Managers*, Van Nostrand Reinhold (International Thompson Publishing), New York.
- Cameron, K. S. 1986a, 'Effectiveness As A Paradox: Consensus And Conflict In Conceptions Of Organisational Effectiveness', *Management Science*, vol. 32, no. 5, pp. 539 - 553.

- Cameron, K. S. 1986b, 'A Study Of Organisational Effectiveness And Its Predictors', *Management Science*, vol. 32, no. 1, pp. 87 - 112.
- Capon, N., Farley, J. U. and Hoenig, S. 1990, 'Determinants Of Financial Performance: A Meta Analysis', *Management Science*, vol. 36, no. 10, pp. 1143 - 1159.
- Castronova, E. and Hagstrom, P. 2004, 'The Demand For Credit Cards: Evidence From The Survey Of Consumer Finances', *Economic Inquiry*, vol. 42, no. 2.
- Cleland, D. I. (ed.) 1998, *Field Guide To Project Management*, John Wiley And Sons Inc., New York.
- Clement, A. and Gotlieb, C. C. 1987, 'Evolution Of An Organisational Interface: The New Business Department At A Large Insurance Firm', *ACM Transactions On Office Information Systems*, vol. 5, no. 4, pp. 328-339.
- Clemons, E. K. and Knez, M. 1988, 'Competition And Cooperation In Information Systems', *Information and Management*, no. 15, pp. 25 - 35.
- Cludts, S. 1999, 'Organisation Theory And The Ethics Of Participation', *Journal Of Business Ethics*, no. 21, pp. 151 - 171.
- Cragg, P. B. and King, M. 1992, 'Information System Sophistication And Financial Performance Of Small Engineering Firms', *European Journal Of Information Systems*, vol. 1, no. 6, pp. 417 - 426.
- Crane, D. B. and Bodie, Z. 1996, 'Form Follows Function: The Transformation Of Banking', *Harvard Business Review*, pp. 109 - 117.
- CRB1 2002, Ten Year Summary, CRB1.
- CRB2 1997a, Annual Financial Report 1997, CRB2.
- CRB2 1997b, Annual Report 1997, CRB2.
- CRB2 1998a, Annual Financial Report 1998, CRB2.
- CRB2 1998b, Annual Report 1998, CRB2.
- CRB2 2000a, Annual Financial Report 2000, CRB2.
- CRB2 2000b, Annual Report 2000, CRB2.
- CRB2 2001a, Annual Financial Report 2001, CRB2.

- CRB2 2001b, Annual Report 2001, CRB2.
- CRB2 2002, Annual Financial Report 2002, CRB2.
- CRB2 2003, Annual Report 2003, CRB2.
- CUC2 1998, Financial Report 1998, CUC2.
- CUC2 1999, Financial Report 1999, CUC2.
- CUC2 2001a, Annual Report 2001, CUC2.
- CUC2 2001b, Financial Report 2001, CUC2.
- CUC3 2003, CUC3 Annual Report, CUC3.
- Davis, F. D. 1989, 'Perceived Usefulness, Percieved Ease Of Use, And User Acceptance Of Information Technology', *MIS Quarterly*, vol. 13, pp. 319-340.
- Davis, G. B. and Olson, M. H. 1985, *Management Information Systems: Conceptual Foundations, Structure and Development*, 2nd edn, McGraw Hill, New York.
- Dewan, S. and Kraemer, K. L. 1998, 'International Dimensions Of The Productivity Paradox', *Communications Of The ACM*, vol. 41, no. 8, pp. 56 - 62.
- Doherty, N. F., Marples, C. G. and Suhaimi, A. 1999, 'The Relative Success Of Alternative Approaches To Strategic Information Systems Planning: An Empirical Analysis', *Journal Of Strategic Information Systems*, vol. 8, pp. 262 - 283.
- Doke, E. R. and Luke, R. H. 1987, 'Perceived Quality Of CIS/MIS Journals Among Faculty: Publishing Hierarchies', *Journal Of Computer Information Systems*, vol. 27, no. 4, pp. 30 - 33.
- Dos Santos, B. L., Peffers, K. and Mauer, D. C. 1993, 'The Impact Of Information Technology Investment Announcements On The Maket Value Of The Firm', *Information Systems Research*, vol. 4, no. 1, pp. 1 - 23.
- Doukidis, G. I., Smithson, S. and Naoum, G. 1992, 'Information Systems Management In Greece: Issues And Perceptions', *Journal of Strategic Information Systems*, vol. 1, no. 2, pp. 63-75.

- Duffy, J. A. M. and Ketchand, A. A. 1998, 'Examining The Role Of Service Quality In Overall Service Satisfaction', *Journal Of Managerial Issues*, vol. X, no. 2, pp. 240 - 255.
- Earl, M. J. 1989, *Management Strategies for Information Technology*, Prentice Hall.
- Elliot, S. and Melhuish, P. 1995, 'A Methodology For The Evaluation Of IT For Strategic Implementation', *Journal of Information Technology*, no. 10, pp. 87-100.
- Forester, T. (ed.) 1985, *The Information Technology Revolution*, Blackwell, Oxford.
- Francalanci, C. and Galal, H. 1998, 'Information Technology And Worker Composition: Determinants Of Productivity In The Life Insurance Industry', *MIS Quarterly*, pp. 227 - 241.
- Freeman, B. E. 1999, 'Divergent Stakeholder Theory', *Academy Of Management Review: The Academy Of Management Review*, vol. 24, no. 2, pp. 233 - 236.
- Friedman, M. 1962, *Capitalism And Freedom*, University Of Chicago Press, Chicago, IL.
- Gibson, K. 2000, 'The Moral Basis Of Stakeholder Theory', *Journal Of Business Ethics*, no. 26, pp. 245 - 257.
- Gillenson, M. L. and Stutz, J. D. 1991, 'Academic Issues In MIS: Journals And Books', *MIS Quarterly*, vol. 15, no. 4, pp. 447 - 452.
- Gummesson, E. 1988, 'Service Quality And Product Quality Combined', *Review Of Business*, vol. 9, no. 3.
- Gummesson, E. 2000, *Qualitative Methods In Management Research*, 2nd edn, Sage Publications, Thousand Oaks.
- Gurbaxani, V. and Whang, S. 1991, 'The Impact Of Information Systems On Organisations And Markets', *Communications Of The ACM*, vol. 34, no. 1, pp. 59 - 73.
- Hamilton, S. and Ives, B. 1982, 'Knowledge Utilisation Among MIS Researchers', *MIS Quarterly*, vol. 6, no. 4, pp. 61 - 77.
- Hammer, M. and Stanton, S. A. 1995, *The Re-engineering Revolution*, HarperCollinsPublishers Inc, Sydney, Australia.

- Henderson, J. C. and Venkatraman, N. 1993, 'Strategic Alignment: Leveraging Information Technology For Transforming Organisations', *IBM Systems Journal*, no. 32, pp. 4 - 16.
- Hendrickson, A. R., Massey, P. D. and Cronan, T. P. 1993, 'On The Test-Retest Reliability Of Percieved Usefulness And Percieved Ease Of Use Scales', *MIS Quarterly*, pp. 227 - 230.
- Ho, S. S. M. and Ng, V. T. F. 1994, 'Customers' risk perceptions of electronic payment systems', *The International Journal of Bank Marketing*, vol. 12, no. 8, p. 13.
- Hochstrasser, B. and Griffiths, C. 1991, *Controlling IT Investment*, Chapman And Hall, London.
- Holland, C. P. and Westwood, J. B. 2001, 'Product-Market And Technology Strategies In Banking', *Communications Of The ACM*, vol. 44, no. 6, pp. 53 - 57.
- Holsapple, C. W., Johnson, L. E., Manakyan, H. and Tanner, J. 1993, 'A Citation Analysis Of Business Computing Research Journals', *Information And Management*, vol. 25, no. 5, pp. 231 - 244.
- Howcroft, B. and Beckett, A. 1996, 'Branch networks and the retailing of high credence products', *The International Journal of Bank Marketing*, vol. 14, no. 4.
- Jarvenpaa, S. L., Dickson, G. W. and DeSanctis, G. 1985, 'Methodological Issues In Experimental IS Research: Experiences And Recommendations', *MIS Quarterly*, pp. 141 - 156.
- Jasimuddin, S. M. 2001, 'Analysing The Competitive Advantage Of Saudi Arabia With Porter's Model', *The Journal Of Business and Industrial Marketing*, vol. 16, no. 1.
- Jones, T. M. and Wicks, A. C. 1999, 'Convergent Stakeholder Theory', *The Academy Of Management Review*, vol. 24, no. 2, pp. 206 - 221.
- Jordan, E. and Tricker, B. 1995, 'Information Strategy: Alignment With Organisation Structure', *Journal Of Strategic Information Systems*, vol. 4, no. 4, pp. 357 - 382.

- Jun, M. and Cai, S. 2001, 'The Key Determinants Of Internet Banking Services Quality: A Content Analysis', *The International Journal Of Bank Marketing*, vol. 19, no. 7, pp. 276 - 291.
- Kaplan, R. S. and Norton, D. P. 1996, *The Balanced Scorecard: Translating Strategy Into Action*, Harvard Business School Press, Boston, Mass.
- Karjaluoto, H., Mattila, M. and Pento, T. 2002, 'Electronic banking in Finland: Consumer beliefs and reactions to a new delivery channel', *Journal of Financial Services Marketing*, vol. 6, no. 4.
- Kidder, L. and Judd, C. M. 1986, *Research Methods In Social Relations*, 5th edn, Holt, Rhinehart and Winston, New York.
- King, W. R. 1978, 'Strategic Planning For Information Systems', *MIS Quarterly*, vol. 2, no. 1, pp. 27 - 37.
- King, W. R. and Teo, T. S. H. 1994, 'Facilitators And Inhibitors For The Strategic Use Of Information Technology', *Information And Management*, no. 27, pp. 71 - 87.
- Kolbe, R. H. and Burnett, M. S. 1991, 'Content-Analysis Research: An Examination Of Applications With Directives For Improving Research Reliability And Objectivity', *Journal Of Consumer Research*, vol. 18, pp. 243 - 250.
- Koong, K. S. and Weistroffer, H. R. 1989, 'Faculty Usage Of Management Information Systems Journals: A Survey', *Journal Of Computer Information Systems*, vol. 30, no. 1, p. 14.
- Lee, A. S. 1999, 'Rigor And Relevance In MIS Research: Beyond The Approach Of Positivism Alone', *MIS Quarterly*, vol. 23, no. 1, pp. 29 - 34.
- Lee, B., Barua, A. and Whinston, A. B. 1997, 'Discovery And Representation Of Causal Relationships In MIS Research: A Methodological Framework', *MIS Quarterly*, pp. 109 - 136.
- Lee, B. and Menon, N. M. 2000, 'Information Technology Value Through Different Normative Lenses', *Journal of Management Information Systems*, vol. 16, no. 4, pp. 99 - 119.



- Lee, H., Lee, Y. and Yoo, D. 2000, 'The Determinants Of Percieved Service Quality And Its Relationship With Satisfaction', *The Journal Of Services Marketing*, vol. 14, no. 3.
- Legg, S., Richardson, D., Kennedy, I. and Ellwood, P. 1994, 'The Future Of Financial Services', *Banking World*, vol. 12, no. 1.
- Lewin, A. Y. and Minton, J. W. 1986, 'Determining Organisational Effectiveness: Another Look And An Agenda For Research', *Management Science*, vol. 32, no. 5, pp. 514 - 538.
- Lubbe, S., Parker, G. and Hoard, A. 1995, 'The Profit Impact Of IT Investment', *Journal Of Information Technology*, no. 10, pp. 44 - 51.
- Lyytinen, K. 1999, 'Empirical Research In Information Systems: On The Relevance Of Practice In Thinking Of IS Research', *MIS Quarterly*, vol. 23, no. 1, pp. 25 - 28.
- Mahmood, M. A. and Szewczak, E. J. 1999, *Measuring Information Techonology Investment Payoff: Contemporary Approaches*, Idea Group Publishing, Hershey, PA, USA.
- Markus, L. M. and Lee, A. S. 1999, 'Special Issue On Intensive Research In Information Systems: Using Qualitative, Interpretive And Case Methods to Study Information Systems - Foreword', *MIS Quarterly*, vol. 23, no. 1, pp. 35 - 38.
- Mason, R. O. and Mitroff, I. I. 1973, 'A Program For Research On Management Information Systems', *Management Science*, no. 19, pp. 475 - 487.
- Mckillop, D., Charles, F. and O'Rourke, G. 1997, 'A Typology Of Credit Unions', *ICA Review*, vol. 90, no. 1, pp. 39 - 47.
- Mclean, E. R. and Soden, J. V. 1977, *Strategic Planning For MIS*, Jonh Wiley And Sons, New York.
- Mersha, T. and Adlakha, V. 1992, 'Attributes Of Service Quality: The Consumers Perspective', *International Journal Of Service Industry Management*, vol. 3, no. 3.

- Migliore, H. R., Howard, M. G. and Ames, K. L. 1999, 'Into The Future: The Application Of Strategic Long Range Planning/MBO For The Banking Industry', *Bank News*, vol. 99, no. 7, pp. 16-20.
- Mikko, R. 1991, 'Stakeholders Of Strategic Information Systems Planning: theoretical Concepts And Emprical Examples', *Journal Of Strategic Information Systems*, vol. 1, no. 1, pp. 15 - 28.
- Mirani, R. and Lederer, A. L. 1998, 'An Instrument For Assessing The Organisational Benefits Of IS Projects', *Decision Sciences*, vol. 29, no. 4, pp. 803-838.
- Moschella, D. 1997, *Waves Of Power: Dynamics Of Global Technology Leadership 1964 - 2010*, Amacom, New York.
- Mukhopadhyay, T., Kekre, S. and Kalathur, S. 1995, 'Business Value Of Information Technology: A Study Of Electronic Data Interchange', *MIS Quarterly*, pp. 137 - 156.
- Mukhopadhyay, T., Rajiv, S. and Srinivasan, K. 1997, 'Information Technology Impact On Process Output And Quality', *Management Science*, vol. 43, no. 12, pp. 1645 - 1659.
- Nault, B. R. 1998, 'Information Technology And Organisational Design', *Management Science*, vol. 44, no. 19, pp. 1321 - 1335.
- Niederman, F., Brancheau, J. C. and Wetherbe, J. 1991, 'Information Systems Management Issues For The 1990s', *MIS Quarterly*, vol. 15, no. 4, pp. 474 - 500.
- Nord, J. H. and Nord, G. D. 1995, 'MIS Research: Journal Status Assessment And Analysis', *Information And Management*, vol. 29, pp. 29 - 42.
- Osterman, P. 1986, 'The Impact Of Computers On The Employment Of Clerks And Managers', *Industrial And Labor Relations Review*, vol. 39, no. 2, pp. 175 - 186.
- O'Sullivan, O. 2000, 'Net banks: More dream than reality', In *USBanker*, vol. 110.
- Owen, D. 1993, 'Calculating Customer Happiness', *Managing Service Quality*, vol. 3, no. 2, pp. 445 - 448.

- PC1 1997, Annual Report 1997, PC1.
- PC1 1998, Annual Report 1998, PC1.
- PC1 1999, Annual Report 1999, PC1.
- PC1 2000, Annual Report 2000, PC1.
- PC1 2002a, Concise Annual Report 2002, PC1.
- PC1 2002b, Full Annual Report 2002, PC1.
- Pervan, G. 1998a, 'How Chief Executive Officers In Large Organisations View The Management Of Their Information Systems', *Journal of Information Technology*, no. 13, pp. 95-109.
- Pervan, G. 1998b, 'A Review Of Research In Group Support Systems: Leaders, Approaches and Directions', *Decision Support Systems*, vol. 23, pp. 149-159.
- Raghunathan, T. S., Gupta, Y. and Sundararaghavan, P. S. 1989, 'Assessing The Impact Of IS Executives' Critical Success Factors On The Performance Of IS Organisations', *Information and Management*, no. 17, pp. 157 - 168.
- Rai, A., Patnayakuni, R. and Patnayakuni, N. 1997, 'Technology Investment And Business Performance', *Communications Of The ACM*, vol. 40, no. 7, pp. 89 - 97.
- Roach, S. S. 1987, *America's Technology Dilemma: A Profile Of The Information Economy*, Special Economic Review, Morgan Stanley Co.
- Roach, S. S. 1989, 'Pitfalls On The 'New' Assembly Line: Can Services Learn From Manufacturing?', *Economic Perspectives*, Morgan Stanley And Co.
- Schumpeter, J. A. 1969, 'The Dynamics Of Competition And Monopoly', in *Monopoly And Competition: Selected Readings*, ed. Hunter, A., Harmondsworth - Penguin, pp. 40 -67.
- Shanks, G. 2002, 'Guidelines For Conducting Positivist Case Study Research In Information Systems', *Australian Journal Of Information Systems - Special Issue December 2002*, pp. 76 - 85.
- Singleton, J. P., Mclean, E. R. and Altman, E. N. 1988, 'Measuring Information Systems Performance: Experience With The Management By Results System At Security Pacific Bank', *MIS Quarterly*, pp. 324 - 337.

- Smith, A. 1937, *An Inquiry Into The Nature And Causes Of The Wealth Of The Nations*, Random House, New York NY.
- Smith, N. C. and Dainty, P. (eds.) 1991, *The Management Research Handbook*, Routledge, London.
- Smithson, S. and Hirscheim, R. 1998, 'Analysing Information Systems Evaluation: Another Look At An Old Problem', *European Journal Of Information Systems*, vol. 7, pp. 158 - 174.
- Stake, R. E. 1995, *The Art Of Case Study Research*, Sage Publications, Inc, Thousand Oaks, California.
- Steiner, T. D. and Teixeira, D. B. 1990, *Technology In Banking: Creating Value And Destroying Profits*, Dow Jones Irwin, New York.
- Strassmann, P. 1985, *Information Payoff: The Transformation Of Work In The Electronic Age*, The Free Press, New York.
- Straub, D. W. 1989, 'Validating Instruments In MIS Research', *MIS Quarterly*, pp. 147 - 169.
- Tainio, R., Korhonen, P. J. and Santalainen, T. J. 1991, 'In Search Of Explanations For Bank Performance- Some Finnish Data', *Organisation Studies*, vol. 12, no. 3, pp. 425 - 450.
- Taylor, B. and Morison, I. 1999, *Driving Strategic Change In Financial Services*, Woodhead Publishing Ltd, Cambridge.
- Taylor, C. 1994, 'Where technology provides the service solution', *Managing Service Quality*, vol. 4, no. 1.
- ten Have, S., ten Have, W., Stevens, F., van der Elst, M. and Pol-Coyne, F. 2003, *Key Management Models*, Pearson Education Limited, London.
- Thornton, J. and White, L. 2001, 'Customer orientations and usage of financial distribution channels', *The Journal of Services Marketing*, vol. 15, no. 3.
- Thorp, J. 1998, *The Information Paradox - Realising the Business Benefits of Information Technology*, McGraw Hill.

- Trevino, L. K. and Weaver, G. R. 1999, 'The Stakeholder Research Tradition: Converging Theorists - Not Convergent Theory', *Academy Of Management Review: The Academy Of Management Review*, vol. 24, no. 2, pp. 222 - 227.
- Turner, J. 1985, 'Organisational Performance, Size And The Use Of Data Processing Resources', Center for Research In Information Systems, New York University (Working Paper #58).
- Turner, J. and Lucas, H. C. 1985, 'Developing Strategic Information Systems', in *Handbook Of Business Strategy*, ed. Guth, W., Warren Gorham and Lamont, Boston, pp. 21/1 - 21/35.
- Turner, J. A. 1982a, 'Firm Size, Performance And Computer Use', in *Proceedings of the Third International Conference on Information Systems*, ed. Guth, W., Warren Gorham and Lamont, Boston, pp. 109-120.
- Turner, J. A. 1982b, 'Observations On The Use Of Behavioural Models In Information Systems Research And Practice', *Information And Management*, no. 5, pp. 207 - 213.
- Valentine, T. and Ford, G. (eds.) 1999, *Readings In Financial Institution Management: Modern Techniques For A Global Industry*, Allen And Unwin, St Leonards, NSW.
- Vogel, D. R. and Wetherbe, J. 1984, 'MIS Research: A Profile Of Leading Journals And Universities', *Data Base*, vol. 15, no. 3, pp. 3 - 14.
- Waema, T. and Walsham, G. 1990, 'Information Systems Strategy Formulation', *Information and Management*, no. 18, pp. 29 - 39.
- Walsham, G. 1999, 'Interpretive Evaluation design For Information Systems', in *Beyond The Productivity Paradox*, eds. Willcocks, L. and Lester, S., John Wiley and Sons Ltd, Baffins Lane, Chichester, pp. 363 - 380.
- Wang, P. and Turban, E. 1994, 'Management Information Systems Issues Of The 1990s In The Republic Of China: An Industry Analysis', *International Journal Of Information Management*, no. 14, pp. 25-38.
- Ward, J., Taylor, P. and Bond, P. 1996, 'Evaluation And Realisation Of IS/IT Benefits: An Empirical Study Of Current Practice', *European Journal Of Information Systems*, vol. 4, pp. 214 - 225.

- Watson, R. T. and Brancheau, J. C. 1991, 'Key Issues In Information Management: An International Perspective', *Information and Management*, no. 20, pp. 118-129.
- Wehrich, H. 1999, 'Analysing The Competitive Advantages And Disadvantages Of Germany With The TOWS Matrix - An Alternative To Porter's Model', *European Business Review*, vol. 99, no. 1.
- Weill, P. and Broadbent, M. 1998, *Leveraging The New Infrastructure: How Market Leaders Capitalise On Information Technology*, Harvard Business School Press, Boston, Massachusetts.
- Weill, P. and Broadbent, M. 1999, 'Four Views Of Infrastructure: Implications For IT Investments', in *Beyond The IT Productivity Paradox*, eds. Willcocks, L. and Lester, S., John Wiley And Sons, Chichester, UK, pp. 335 - 360.
- WOCCU 2001, 2001 Statistical Report, World Council Of Credit Unions Inc.
- WOCCU 2003, WOCCU members, Available: [<http://www.woccu.org/about/memlist.htm>] (29 May 2003).
- Wright, D. T. and Burns, N. D. 1998, 'New Organisation Structures For Global Business: An Empirical Study', *International Journal Of Operations And Production Management*, vol. 18, no. 9/10.
- Zsidsin, G. A., Jun, M. and Adams, L. L. 2000, 'The Relationship Between Information Technology And Service Quality In The Dual-Direction Supply Chain: A Case Study Approach', *International Journal Of Service Industry Management*, vol. 11, no. 4.
- Zviran, M. 1990, 'Relationships Between Organisational And Information Systems Objectives: Some Empirical Evidence', *Journal of Management Information Systems*, vol. 7, no. 1, pp. 65 - 84.

## **1.0 Appendix 1 – Meta-analysis Instrument and Statistical Tables**

Appendix 1-1	Literature Review Data Sheet
Appendix 1-2	Statistical Tables

Appendix 1-1:  
Literature Review  
Data Sheet



ID #

**Literature Review Data Sheet**

Author(s)	Affiliation

**Title:**

**Publication:**

**Year:**

**Barki Code(s):**

**Annotated Bibliography**      Yes       No

**Study Characteristics:**

Exploratory       Explanatory       Descriptive

**Stage of theory:**      Building       Testing       Extension

**Epistemology:**      Positivist       Interpretivist       Mixed

**Research Method:**

Empirical		Non-Empirical	
Secondary Data		Subjective/Argumentative	
Field experiment		Reviews	
Survey		Action research	
Case study		Descriptive/Interpretive	
Forecasting		Futures research	
Simulation		Role/game playing	
Theorem proof			

**Time Scale:**      Cross-Sectional, Single shot       Longitudinal

**Dependent Variable(s):**

Variable	Description

**Independent Variable(s):**

Variable	Description

**Data Analysis:**

**Research focus** (*e.g IS/IT Strategy, planning, evaluation, implementation etc*):

.....  
.....  
.....

**Link Proven:**      Yes (Direct), No, Mixed, Yes (Indirect)

**Base Theory(ies):**

**Data Source:**

Primary/Secondary

Industry:

Number Of Organisations:

**Other similar publications by authors**

# Appendix 1-2: Statistical Tables

**Table A1.1: Base Theory And Disciplines**

Category label	Code	Count	Pct of Responses	Pct of Cases
Microeconomic Theory Of The Firm	1	3	4.8	7.1
Theory Of Production	2	7	11.3	16.7
Information Economics	4	3	4.8	7.1
Options theory	8	1	1.6	2.4
Organisational Theory	9	4	6.5	9.5
Stakeholder Theory	10	2	3.2	4.8
Resource Based View Of IS/IT	11	3	4.8	7.1
Miles and Snow Typology	12	2	3.2	4.8
McFarlan's Strategic Grid	13	3	4.8	7.1
Competitive Advantage (Porter)	14	7	11.3	16.7
Theory Of The Consumer	15	1	1.6	2.4
Key Ratios Approach	16	8	12.9	19.0
Managerial/Conversion Effectiveness	17	5	8.1	11.9
Locus Of Value	18	1	1.6	2.4
Business Process Reengineering	19	1	1.6	2.4
Contingency Theory	20	1	1.6	2.4
Productivity Paradox	21	5	8.1	11.9
None	22	1	1.6	2.4
Tobin's q	23	2	3.2	4.8
Demand Function (Economics)	24	1	1.6	2.4
Systems Resource Theory	25	1	1.6	2.4
		Total responses	62	100.0
				147.6

1 missing cases; 42 valid cases

**Table A1.2: Breakdown of data sources by Industry**

	Frequency	Percent	Valid Percent	Cumulative Percent
Manufacturing	4	9.3	10.5	10.5
Banking and Finance	3	7.0	7.9	18.4
Health	3	7.0	7.9	26.3
Fast Food	1	2.3	2.6	28.9
Insurance	3	7.0	7.9	36.8
Engineering	1	2.3	2.6	39.5
Cross Sectoral	23	53.5	60.5	100.0
Total	38	88.4	100.0	
Missing System	5	11.6		
Total	43	100.0		

**Table A1.3: Dependent Variables**

Category label	Code	Count	Pct of Responses	Pct of Cases
Return On Sales	1	8	5.2	20.5
Return On Investment	2	5	3.2	12.8
Growth In Revenue	3	13	8.4	33.3
Sales By Employee	4	3	1.9	7.7
Cash Flow To Investment	5	2	1.3	5.1
Sales By Total Assets	6	3	1.9	7.7
Market Value To Book Value	7	3	1.9	7.7
Total Debt To Equity	8	2	1.3	5.1
Working Capital By Net Sales	9	2	1.3	5.1
Dividend Payout Ratio	10	2	1.3	5.1
Human Resources (IT and Non IT)	11	2	1.3	5.1
Sales Growth	15	7	4.5	17.9
Financial Resources	16	1	.6	2.6
Liquidity	17	1	.6	2.6
Investment Capability	18	1	.6	2.6
Public Image	19	1	.6	2.6
Client Loyalty	20	1	.6	2.6
Innovativeness	21	2	1.3	5.1
Market Position/Share	22	2	1.3	5.1
Mass Customisation	23	1	.6	2.6
Difficulty To Duplicate	24	1	.6	2.6
Net Sales	25	1	.6	2.6
Gross Profit	27	2	1.3	5.1
Net Income	28	1	.6	2.6
Gearing Ratio	29	1	.6	2.6
Debt To Net Sales Ratio	30	1	.6	2.6
Return On Assets	31	9	5.8	23.1
(Price change+Accum Div)/Initial Price	34	1	.6	2.6
Return On Equity	42	4	2.6	10.3
Operating Profit Margin	43	1	.6	2.6
Net Profit	44	2	1.3	5.1
Fixed Assets Turnover	45	1	.6	2.6
Total Assets Turnover	46	2	1.3	5.1
Inventory Turnover	47	3	1.9	7.7
Cultural Differences	48	1	.6	2.6
IS Integration	49	1	.6	2.6
IT Capital	51	1	.6	2.6
Firm Productivity	52	4	2.6	10.3
Percentage Change In Labour	54	1	.6	2.6
Instalment Loans	55	1	.6	2.6
Real Estate Mortgage Loans	56	1	.6	2.6
Commercial And Other Loans	57	1	.6	2.6
Demand Deposits	58	1	.6	2.6
Accounts Receivable Turnover	60	1	.6	2.6

*Appendix 1 – Meta-analysis Instrument and Statistical Tables*

Income Per Employee	61	1	.6	2.6
Sales Per Employee	62	1	.6	2.6
Net Patient Revenue Per Day	63	1	.6	2.6
Net Patient Revenue Per Admission	64	1	.6	2.6
Mortality Rate	65	1	.6	2.6
Customer Satisfaction	66	1	.6	2.6
Value of New Technology Project	67	1	.6	2.6
Human Resource Differentiation	68	1	.6	2.6
Product Differentiation	69	1	.6	2.6
Technology Leadership	70	1	.6	2.6
Market Share Orientation	71	1	.6	2.6
Cost Orientation	72	1	.6	2.6
Segmentation	73	1	.6	2.6
Product Breadth	74	1	.6	2.6
Non IT Labour	75	3	1.9	7.7
Staff Training	76	1	.6	2.6
Other	77	1	.6	2.6
Non-IT Capital	78	1	.6	2.6
Revenue	79	1	.6	2.6
Profit	80	1	.6	2.6
Demand	81	1	.6	2.6
Computerisation Index	82	1	.6	2.6
Operating Income/Sales	83	1	.6	2.6
Operating Income/Assets	84	1	.6	2.6
Operating Income/Employees	85	1	.6	2.6
Operating Expenses/Sales	86	1	.6	2.6
Operating Costs/Sales	87	1	.6	2.6
COGS/Sales	88	2	1.3	5.1
Capital investment	97	1	.6	2.6
Annual Dollars written off	98	1	.6	2.6
Premium freight	99	1	.6	2.6
Tobin's q	101	1	.6	2.6
Output	102	2	1.3	5.1
1 Year Sales	104	1	.6	2.6
Net Return	105	1	.6	2.6
5 Year Sales	106	1	.6	2.6
PCs or Terminals Per Employee	107	1	.6	2.6
Consumer Surplus	108	1	.6	2.6
Must Do	109	1	.6	2.6
Act Of Faith	110	1	.6	2.6
Logic	111	1	.6	2.6
Size	112	1	.6	2.6
Direction	113	1	.6	2.6
Value	114	1	.6	2.6
Money	115	1	.6	2.6
IT Expense	116	1	.6	2.6
		-----	-----	-----
Total responses		155	100.0	397.4

4 missing cases; 39 valid cases

**Table A1.4: Control Variables**

Category label	Code	Count	Pct of Responses	Pct of Cases
Task Elements	1	1	3.2	14.3
IT Skills	2	1	3.2	14.3
Information Type	3	1	3.2	14.3
Response Capabilities	4	1	3.2	14.3
Intelligence	5	1	3.2	14.3
Skills	6	1	3.2	14.3
Experience	7	1	3.2	14.3
Training	8	1	3.2	14.3
Organisational Design	9	1	3.2	14.3
Work Units Design	10	1	3.2	14.3
Work Environment	11	1	3.2	14.3
Reward System	12	1	3.2	14.3
Organisational Size (FTE)	13	2	6.5	28.6
Environmental Uncertainty	14	2	6.5	28.6
Strategy Orientation	15	1	3.2	14.3
IT Strategy Integration	16	1	3.2	14.3
Number Of ATMs	17	1	3.2	14.3
Number Of Computerised Bank Functions	18	1	3.2	14.3
Case mix	19	1	3.2	14.3
Labour Intensity (FTE)	20	1	3.2	14.3
% Patients On Medicare	21	1	3.2	14.3
% Patients on Medicaid	22	1	3.2	14.3
Outpatient revenue/Total Revenue	23	1	3.2	14.3
Per Capita Income	24	1	3.2	14.3
Capacity Utilisation	25	1	3.2	14.3
Inventory Turnover	26	1	3.2	14.3
Relative Inferior Quality	27	1	3.2	14.3
Relative Price	28	1	3.2	14.3
New Products	29	1	3.2	14.3
		-----	-----	-----
	Total responses	31	100.0	442.9

36 missing cases; 7 valid cases

**Table A1.5: Independent Variables**

Category label	Code	Count	Pct of Responses	Pct of Cases
IT Capital	1	8	4.4	20.5
IT Budget	2	2	1.1	5.1
IT Budget/Revenue	3	4	2.2	10.3
IT Asset Value	4	2	1.1	5.1

*Appendix 1 – Meta-analysis Instrument and Statistical Tables*

IT Asset Value/Revenue	5	4	2.2	10.3
Total Number Of PCs And Terminals In Org	6	2	1.1	5.1
PCs Or Terminals Per employee	7	4	2.2	10.3
IT Staff Costs/IT Budget	8	5	2.8	12.8
IT Training Costs/IT Budget	9	4	2.2	10.3
Organisational Structure	10	2	1.1	5.1
Alignment With Business Planning	11	1	.6	2.6
Modularity	21	1	.6	2.6
Integration	22	1	.6	2.6
IT Personal Flexibility	23	1	.6	2.6
IS Cost/Net Sales	24	1	.6	2.6
IS Cost/Office Workers	25	1	.6	2.6
IT Budget/Total Assets	26	1	.6	2.6
Human Resources	29	3	1.7	7.7
Management Of IS Function	30	2	1.1	5.1
Growth In Sales	32	3	1.7	7.7
Accounts Receivable Turnover	34	1	.6	2.6
Profitability	35	1	.6	2.6
IT Investment	36	2	1.1	5.1
Merger Effectiveness	37	1	.6	2.6
Inventory Turnover	39	2	1.1	5.1
Non-IT Capital	43	8	4.4	20.5
IT Purchases	44	1	.6	2.6
Annual Sales	47	1	.6	2.6
Medical Labour	49	1	.6	2.6
IT Labour	50	6	3.3	15.4
Medical IT Capital	51	1	.6	2.6
Medical Capital	52	1	.6	2.6
IT Usage	53	2	1.1	5.1
Asset Turnover	54	1	.6	2.6
Strategic IT	55	2	1.1	5.1
Transactional IT	56	2	1.1	5.1
Informational IT	57	2	1.1	5.1
Time Deposits	58	1	.6	2.6
IS Expenses	59	4	2.2	10.3
Breakfast And Other Sales	60	1	.6	2.6
Random Inefficiency	61	1	.6	2.6
IT Support	62	1	.6	2.6
Value Of 1st Stage Project via NPV	63	1	.6	2.6
Sum Value of 2nd Options	64	1	.6	2.6
Product IT	65	1	.6	2.6
Process IT	66	1	.6	2.6
Return On Assets	67	3	1.7	7.7
Cost Efficiency	68	1	.6	2.6
Technical Efficiency	69	1	.6	2.6
Allocative Efficiency	70	1	.6	2.6
Return On Sales	71	1	.6	2.6
Sales/Employee	72	1	.6	2.6

*Appendix 1 – Meta-analysis Instrument and Statistical Tables*

Vertical Integration	73	1	.6	2.6
Computer Price	75	1	.6	2.6
Income	76	2	1.1	5.1
Market Share	77	3	1.7	7.7
Total Assets	78	2	1.1	5.1
Equity	79	1	.6	2.6
Closing Price	80	2	1.1	5.1
Outstanding Shares	81	2	1.1	5.1
Cost	82	1	.6	2.6
Unit Price	83	1	.6	2.6
Quality	84	1	.6	2.6
Price Sensitivity Parameter	86	1	.6	2.6
Quality Sensitivity Parameter	87	1	.6	2.6
Diversification	88	1	.6	2.6
Fixed Costs Of Overhead	89	1	.6	2.6
Unit Costs Of Quality	90	1	.6	2.6
Fixed Costs Of Quality	91	1	.6	2.6
Intranet Use	92	1	.6	2.6
Internet Use	93	1	.6	2.6
Autonomy	94	1	.6	2.6
Participation	95	1	.6	2.6
Strategic Impact Of IT	96	1	.6	2.6
Technological Infrastructure	97	2	1.1	5.1
Organisational Infrastructure	98	1	.6	2.6
Administrative infrastructure	99	1	.6	2.6
Technological Scanning	100	1	.6	2.6
IT Stock	101	1	.6	2.6
Industry	102	2	1.1	5.1
Operating Expense	103	2	1.1	5.1
Total Shareholder Return	105	1	.6	2.6
Intangible IT enabled resources	106	1	.6	2.6
Managerial Intensity	107	1	.6	2.6
Professional Intensity	108	1	.6	2.6
Clerical Intensity	109	1	.6	2.6
Income/Employee	110	2	1.1	5.1
Operating expense/income	111	1	.6	2.6
Return On Equity	112	1	.6	2.6
Annual production volume	113	1	.6	2.6
Debt	116	1	.6	2.6
Non-IT labour	117	3	1.7	7.7
No Computer	119	1	.6	2.6
Unsophisticated IS	120	1	.6	2.6
Semi Sophisticated IS	121	1	.6	2.6
Sophisticated IS	122	1	.6	2.6
Must Do	123	1	.6	2.6
Act Of Faith	124	1	.6	2.6
Logic	125	1	.6	2.6
Size	126	1	.6	2.6



Appendix 1 – Meta-analysis Instrument and Statistical Tables

Direction	127	1	.6	2.6
Value	128	2	1.1	5.1
Money	129	2	1.1	5.1
Output Price	130	1	.6	2.6
Non-IT Capital/Total Assets	131	1	.6	2.6
Debt/Equity	132	1	.6	2.6
R & D Stock	133	1	.6	2.6
EDI Availability	134	1	.6	2.6
Minor Inventory Change	135	1	.6	2.6
Major Inventory Change	136	1	.6	2.6
R & D Intensity	137	1	.6	2.6
Year	138	1	.6	2.6
		-----	-----	-----
	Total responses	181	100.0	464.1
4 missing cases; 39 valid cases				

**Table A1.6: Data Analysis**

Category label	Code	Count	Pct of Responses	Pct of Cases
Descriptive Statistics	1	4	6.1	9.5
Kruskall-Wallis One Way ANOVA	2	1	1.5	2.4
Correlation Analysis	3	11	16.7	26.2
Cluster Analysis	4	4	6.1	9.5
MANOVA	5	1	1.5	2.4
Partial Correlation	6	1	1.5	2.4
Multiple Regression	7	2	3.0	4.8
Qualitative/Content Analysis	8	2	3.0	4.8
Factor Analysis	9	1	1.5	2.4
Moderated Regression Analysis	10	1	1.5	2.4
Descriptive/Interpretive	11	1	1.5	2.4
t-tests	12	3	4.5	7.1
Linear Regression	14	10	15.2	23.8
Ordinary Least Squares	16	4	6.1	9.5
Hierarchical Regression Analysis	17	1	1.5	2.4
Event Study	18	1	1.5	2.4
Real Options Analysis	19	1	1.5	2.4
Path Analysis	20	1	1.5	2.4
Principle Components Analysis	21	1	1.5	2.4
Data Envelopment Analysis	22	3	4.5	7.1
Partial Least Squares	23	1	1.5	2.4
Kolmogorov Smirnov Test	24	1	1.5	2.4
Iterative Seemingly Unrelated Regression	26	1	1.5	2.4
Canonical Correlation Analysis	27	2	3.0	4.8
Non-Parametric Statistics	29	1	1.5	2.4
Panel Data Analysis	30	1	1.5	2.4
Interview Data Analysis	31	1	1.5	2.4
No Data Analysis/Discussion	32	2	3.0	4.8

*Appendix 1 – Meta-analysis Instrument and Statistical Tables*

Index Number Method	33	1	1.5	2.4
Two Stage Least Squares	34	1	1.5	2.4
		-----	-----	-----
Total responses		66	100.0	157.1

1 missing cases; 42 valid cases

**Table A1.7: Frequencies of publications by Journal**

Journal	Frequency	Percent
European Journal Of Information Systems	4	9.3
Information And Management	7	16.3
Information Systems Research	5	11.6
Journal Of Information Technology	2	4.7
Journal Of Management Information Systems	11	25.6
Journal Of Strategic Information Systems	3	7.0
MIS Quarterly	7	16.3
Management Science	3	7.0
Journal Of Information Systems	1	2.3
Total	43	100.0

**Table A1.8: Distribution of articles by year ranges**

Year Ranges	Frequency	Percent
1989-1994	15	34.9
1995-2001	28	65.1
Total	43	100.0

**Table A1.9**

Year	Frequency	Percent
1989	1	2.3
1990	4	9.3
1991	4	9.3
1992	2	4.7
1993	3	7.0
1994	1	2.3
1995	6	14.0
1996	4	9.3
1998	2	4.7
1999	2	4.7
2000	9	20.9
2001	5	11.6
Total	43	100.0

## **2.0 Appendix 2 – Research Design**

Appendix 2-1	Gantt Chart
Appendix 2-2	Case Study Protocol and Research Instrument

# Appendix 2-1

## Gantt Chart

Gantt Chart

Table A2.1: Thesis Gantt Chart

TASKS		Feb 01 to Aug 01	Sept 01 to Dec 01	Jan 01 to Feb 02	Mar 02 to Feb 04	Mar 04 to Apr 04	May 04 to Jul 04	Total (Months)
Model Definition	Selection of topic	█						3
	Definition of Research question		█					4
	Develop and test research instruments		█					3
Model development and testing	Selection of population/cases			█				2
	Iterative data collection by interview, document reviews and observation				█			
	Iterative data analysis				█			21
Model Refine	Conduct survey					█		2
	Compare Case and Survey results with literature.					█		3
On-going Activities	Refine and finalise conceptual model						█	3
	On going write-up and finalisation of thesis	█	█	█	█	█	█	41

# Appendix 2-2

## Case Study Protocol and Research Instrument

**Appendix 2-2 – Table of Contents**

<b>CASE STUDY PROTOCOL</b>	<b>2-VII</b>
CONFIDENTIALITY AND DATA STORAGE	2-VII
PUBLICATION	2-VII
DOCUMENTATION	2-VII
ORGANISATION OF THIS PROTOCOL	2-VII
<b>SECTION 1 – GENERAL</b>	<b>2-IX</b>
OVERVIEW OF RESEARCH PROJECT	2-IX
THE CASE STUDY METHOD	2-IX
<b>SECTION 2 – PROCEDURES</b>	<b>2-X</b>
ESTABLISHING CONTACT	2-X
SELECTION OF CASES	2-X
NUMBER OF CASES	2-XI
SCHEDULING OF FIELD VISITS	2-XI
LENGTH OF SESSIONS	2-XI
EQUIPMENT AND STATIONERY	2-XI
<b>SECTION 3 – RESEARCH INSTRUMENT</b>	<b>2-XII</b>
INTRODUCTION	2-XII
IS/IT PORTFOLIO	2-XII
ORGANISATIONAL PERFORMANCE	2-XIV
CONVERSION EFFECTIVENESS	2-XV
KEY CONSIDERATIONS FOR (SISP)	2-XVII
ORGANISATIONAL CONTEXT	2-XVIII
QUESTIONS	2-XVIII
<b>SECTION 4 – QUALITATIVE DATA ANALYSIS AND DISPLAYS</b>	<b>2-XIX</b>
OVERVIEW OF DATA ANALYSIS	2-XIX
INDIVIDUAL CASE REPORT	2-XX
TRIANGULATION OF DATA FROM MULTIPLE SOURCES	2-XX
TRIANGULATION OF PERSPECTIVES FROM MULTIPLE PARTICIPANTS	2-XXI
DATA SCHEMA	2-XXIII
CODES FROM INTERVIEW TRANSCRIPTS	2-XXV

## **Case Study Protocol**

The Case Study Protocol is the guide that will be used in this research project. The protocol outlines the procedures and rules that will govern the conduct of the researcher and the research project. The protocol also contains the instrument that will be used to collect all data for the project. The instrument itself is a detailed guide for conducting interviews and collection of data in the selected organisations. It consists of questions directed towards establishing the main components of the conceptual model and guides for appropriate document collection. In addition the protocol also contains a guide for the data analysis that will be performed once data has been collected.

### **Confidentiality And Data Storage**

Data will be collected and stored according to guidelines for research as published at <http://www.health.gov.au/nhmrc/research/general/nhmrcavc.htm>

These are the general guidelines for research as adopted and recommended by Curtin University. In addition, the final thesis document will also be made available on Compact Disk both as a word document and in HTML format.

### **Publication**

Each case study will be written up and summarised in a case analysis document. These will later be compiled together to form the final research document. In addition, as part of the research process, some or all of these cases may further be compiled into articles for publication at academic conferences and/or in journals.

### **Documentation**

Note that, in all cases where the protocol requires documentation regarding financial data, this should be collected for five years from **1997** up to and including **2001**.

### **Organisation of This Protocol**

This protocol is organised into the following sections:

#### **Section 1 – General**

- Overview of the research project
- The case study method

#### **Section 2 – Procedures**

- Initial approach to organisations



- Scheduling of field visits
- Equipment and stationery

**Section 3 – Case Study Instrument**

- IS/IT Portfolio
- Organisational Performance
- Conversion Effectiveness
- Considerations for SISP
- Organisational context

**Section 4 – Qualitative data analysis and displays**

- Within (Individual) case analysis
    - Descriptive information
    - Explanatory information
    - Individual case report
  - Cross case analyses
    - Descriptive information
    - Explanatory information
    - Cross case report
-

## **Section 1 – General**

This section provides an overview of the research project in terms of: (a) what the project seeks to address, (b) why it is important to conduct this research and (c) How this research will be conducted.

### **Overview of Research Project**

The research project seeks to investigate the relationship between investment in IS/IT and organisational performance. A conceptual model of this relationship has been proposed and defined based on a review of key literature. The ultimate aim of the project is to validate this conceptual model in terms of the extant literature through the use of the data collected in an industry setting. To this end the industry of interest will be the banking sector, as it continues to be a leader in both investment and utilisation of IS/IT.

The research issue itself is one that is of significant interest to both industry and academia. It is a very complex issue that is not only important, but one that may even be considered critical to the survival of an organisation given the prevalence and diffusion of IS/IT in most organisations today. Practical experience has shown that even though organisations continue to invest in IS/IT, the true nature of the contribution of IS/IT to an organisation's performance is still not clear nor can it be clearly quantified. In essence therefore, we intend to find out how this investment affects performance and in so doing gain a clearer perspective as to how organisations can maximise their existing (and future investments) in IS/IT. From an academic perspective, such knowledge will be useful not only for future research but also in the development and training of IS/IT professionals.

### **The Case Study Method**

The research method that will be used in this study will be the *Case Study Method*. This method has been chosen primarily because the aim of the research project is theory/model building and the nature of the problem lends itself well to the use of this method.

The case study approach is particularly attractive in this situation as it is obvious that there exists a problem about which there seems does not seem to be a clear agreement in the reviewed literature and which is clearly difficult to substantiate using existing theory.

It is expected that approximately six organisations will participate in the research project as follows, two small sized, two medium sized and two large organisations. Specific individuals from within each organisation will be interviewed and documentary evidence will also be collected to further support and enhance the analysis being performed.

## **Section 2 – Procedures**

This section outlines the procedures that will govern the conduct of the researcher during the course of the data collection. The procedures detail the manner in which organisations will be contacted, how field visits are to be scheduled and any equipment/stationery that will be required.

### **Establishing Contact**

In a research project of this nature, it is critical that contact be established with key players in the industry such as Chief Executive Officers (C.E.Os), Chief Information Offices (C.I.Os) and Chief Financial Officers (C.F.Os).

Thus, informal contact is to be initiated with a senior manager within a selected FI. Once contact has been established, a meeting is to be proposed during which an overview of the research is to be presented. The objectives of this informal meeting are:

1. To obtain consent from the appropriate senior manager for the research to be conducted in their Financial Institution.
2. To nominate and select participants
3. To set up a schedule of interviews
4. To select a liaison between the researcher and the Financial Institution

The achievement of the foregoing objectives is critical to the commencement of the research. Once informal approval has been obtained, a formal participation letter may then be sent to the organisation.

It is anticipated that the senior manager will have questions relating to, but not limited to, the aforementioned objectives. Other anticipated questions may relate to issues of the type of data to be collected, issues of confidentiality, ethical issues, the storage of data and availability of research results. This meeting will provide an opportunity to address and clarify any such questions.

To assist interviewees in answering the questions and providing requested data, a copy of this protocol shall be made available to the person(s) with whom the initial contact is made. Further, the researcher should at all times provide clear and concise answers to all questions relating to the study and its conduct. If in doubt, the questions raised should be recorded and answers provided at a later stage once clarification has been sought from Curtin Business School, School Of Information Systems.

### **Selection of Cases**

The selection process that has been adopted for this research project is one of *theoretical sampling* as opposed to random sampling, which would be more appropriate for other research methods. The participating organisations would be therefore be deliberately selected based on a set of general criteria. For the research project it was decided before hand to further restrict the selection to a population of

Australian banks. Thus the following general criteria were defined and formed the basis for the theoretical sampling:

1. Must be a Financial Institution
2. Must have an existing IS/IT portfolio

### Number of Cases

Based on the aforementioned general criteria, six cases will be required as follows: three credit unions and three commercial/retail banks.

This spread of organisations is necessary to allow for both “Within Case” Analysis and “Cross Case” Analysis (as detailed in Section 4).

### Scheduling of Field Visits

Once the organisation has agreed to participate, the researcher will contact relevant organisations by telephone and or with e-mail as appropriate to arrange a suitable time with interviewee(s). To facilitate communication, contact with the organisation will be made through the initial contact person(s).

As part of the scheduling process, a calendar of activities will be drafted. This calendar will specify the dates and times for the interview sessions. The purpose of preparing such a calendar is to enable both participants and researcher to plan ahead for the sessions

Site visits may also be arranged with the organisations concerned prior to the interview sessions. The purpose of these visits being to provide the researcher with a clearer picture of the environment being studied.

### Length of Sessions

Interview sessions will be limited to a 60 to 90 minute time frame. Multiple sessions may need to be arranged to ensure that all questions on interview questionnaire are addressed.

If necessary follow-up visits will be arranged to collect any documentary and other data for analysis.

### Equipment And Stationery

The researcher will require:

1. Voice recorder – Recording interview sessions.

2. Stationery – Note taking and observation recording.
3. Diary/PDA – Scheduling of appointments.

## **Section 3 – Research Instrument**

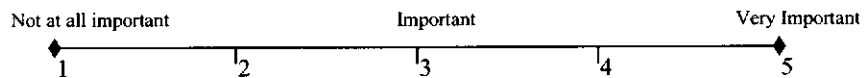
### **Introduction**

Section 3 contains the research instrument that will be used to conduct the data collection via interviews and documentary evidence. Section 3 consists of five subsections each of which contains questions directed towards addressing a specific component of the model as follows:

- Sub-Section 3.1 – IS/IT portfolio
- Sub-Section 3.2 – Organisational performance
- Sub-Section 3.3 – Conversion Effectiveness
- Sub-Section 3.4 – Considerations for SISP
- Sub-Section 3.5 – Organisational context

### **NB:**

In instances where the question requires a rating as part of the response, respondents should be requested to provide ratings from 1 to 5 as illustrated in the standard example below:



### **IS/IT Portfolio**

This section addresses the composition of each case's IS/IT portfolio. Five main questions are to be answered in this regard:

1. How do individual Financial Institutions define what constitutes their IS/IT portfolio?
2. How do individual Financial Institutions determine where and on what to spend their limited resources?
3. How do they justify this expenditure?
4. Do Financial Institutions view these expenditures as beneficial?
5. Do individual Financial Institutions relate these IS/IT investments/expenditure to overall performance?

### **Questions**

1. How do you define IS/IT in your organisation?
  - a. What constitutes your IS/IT portfolio?

- b. How would you rate the importance of the *individual* systems with respect to their contribution to the organisations performance? (*Rate each individual system 1 to 5, i.e. Not at all important to Very important*)
    - c. Is this architecture meeting the needs of the organisation both internally and externally?
    - d. Which area of the IS/IT portfolio needs the most improvement and why?
  2. Which function is responsible for preparing the IS/IT budget?
    - a. Can you briefly outline your budget approval process?
    - b. Who initiates IS/IT requests?
    - c. Given the number of functional areas in your organisation, how do you ensure that all functional area requirements are incorporated in the process?
    - d. Briefly describe the IS/IT acquisition process in your organisation.
    - e. What do you think are the limitations of the process?
  3. What proportion of your organisation’s total budget does total IS/IT expenditure constitute? Can you provide a breakdown of this budget, in terms of (*Percentages/Ratios will be sufficient*):
    - a. Training
    - b. Hardware
    - c. Software
    - d. Licensing etc
  4. How much of your total IS/IT budget is allocated to IS/IT? (*Percentages/Ratios will be sufficient*):
    - a. Operating expense/recurring expenditure?
    - b. Capital expenditure/new investments?
    - c. New/ongoing projects?
    - d. Does this vary from year to year?
    - e. How is this level of expenditure determined?
  5. Do you believe that your organisation’s investment/expenditure in IS/IT contributes to it overall performance?
    - a. If yes, is this contribution positive or negative
    - b. If not, why do you think this is so?
  6. Are you required to perform evaluations of your IS/IT portfolio to demonstrate benefits to the organisation?
    - a. When are you required to do this, i.e.
      - i. For new systems only?
      - ii. For existing systems?
      - iii. As a post implementation activity?, OR
      - iv. As an ongoing activity?
    - b. Can you describe the method(s) that is/are employed to justify potential investment in an IS/IT in your organisation? Are they:
      - i. Financial methods such as ROI, Payback Period, DCF methods (NPV, IRR)?

- ii. Multi-criteria methods?
    - iii. Ratio based methods?
    - iv. Portfolio based methods?
    - v. Others?
    - vi. None?
  - c. Do you believe the methods used are effective? If not, what would you prefer to use?
  - d. From your experience, how long does it take before the benefits of a given IS/IT are fully realised by an organisation?
- 7. How do you judge the success of an IS/IT in your organisation?
  - a. At which point would you make this decision?
- 8. Looking at your industry in general and your organisation in particular, do you think that there is a minimum “threshold” of investment/expenditure in IS/IT required in order for your organisation to remain competitive? Can you quantify this threshold?
- 9. How would you rate the contribution of the various components of your IS/IT portfolio to performance? (*Rate each individual system 1 to 5, i.e. Little/no contribution to Very High contribution*)
  - a. Which class of systems contributes the most and why?
  - b. Which class of systems contributes the least and why?

### Organisational Performance

This section aims to establish the measures that Financial Institutions utilise for determining their performance both internally and externally. Specifically:

1. How do individual Financial Institutions measure their performance:
  - a. Internally?
  - b. Externally?
  - c. Relative to other Financial Institutions?
2. Does the banking industry as a whole have a predetermined set of performance measures? What are they and how are they defined?
3. How is organisational performance related to the IS/IT portfolio?

### Questions

1. Are there any standard measures of organisational performance that are used in the banking industry?
  - a. If yes, do you think that they are appropriate?
  - b. If no, do you think a set of such measures would be useful and in what way?
2. Does your organisation use any measures of organisational performance?
  - a. What are the key internal measures and how are they derived?
    - i. What standards are used to benchmark these measures?





3. Do you believe that senior management in this organisation are committed to the development of effective/efficient IS/IT?
  - a. Does this affect the utilisation and performance of IS/IT?
  - b. Does this have any effect of overall organisational performance?
  
4. Given that IS/IT has been used in the organisation for some time, how would you rate the “level of experience” of this organisation with IS/IT? *(Rate experience level of organisation from 1 to 5, i.e. Not at all experienced to Very experienced)*
  - a. Does this experience provide a good foundation for the best management and utilisation of IS/IT?
  - b. Does this experience lead to better IS/IT performance?
  - c. Does this experience lead to better organisational performance?
  
5. What about the staff in general (including management), how would classify their level of experience with respect to IS/IT?
  - a. IS/IT staff.
  - b. Non-IS/IT staff.*(Rate experience level of Staff from 1 to 5, i.e. Not at all experienced to Very experienced)*
  
6. How would you rate user satisfaction with your IS/IT?
  - a. Internal users, i.e. employees?
  - b. External users, i.e. customers?*(Rate general satisfaction level from 1 to 5, i.e. Not at all satisfied to Very satisfied)*
  
7. With reference to Q6, are there any formal mechanisms for measuring these levels of satisfaction?
  - a. Is this “satisfaction” deemed to have any effect on the performance of the IS/IT and ultimately organisational performance?
  - b. Is this “satisfaction” a critical consideration during IS/IT investment decision processes?
  
8. How would you describe the organisational culture of this organisation?
  - a. Are there any aspects of this culture that influence the IS/IT investment and decision making process?
  
9. Do you think that role of managers in an organisation can affect the utilisation/performance of an IS/IT portfolio? What about that of non-managerial staff?
  - a. Would this contribute to better organisational performance? Can you say this is the case in your organisation?

### Key Considerations For (SISP)

This section seeks to establish the effect of strategic planning actions on the constitution of the IS/IT portfolio. The data collected here is also directed towards determining the secondary effect of performance on the IS/IT portfolio. Specifically:

1. Is SISP a formal part of an individual Financial Institution's activity?
2. What drives SISP in Financial Institutions?
3. What effect does SISP have on the constitution of the IS/IT portfolio?
4. What effect does performance have on SISP?

### Questions

1. Does your organisation perform any strategic planning for IS/IT?
  - a. Can you describe the process briefly?
  - b. Who responsibility is it?
  - c. Who is involved and what are their roles?
  - d. How often is the strategic planning activity for IS/IT carried out?
2. How would you rate the effectiveness of your strategic planning activity?  
(Rate effectiveness from 1 to 5, i.e. Not at all effective to Very effective)
  - a. Any suggestion(s) on how this can be improved?
3. Is the strategy planning process for *IS/IT* separate from the *corporate* strategy planning process?
  - a. If yes, how does your organisation ensure that the resultant plans are properly aligned and work together?
4. When performing the IS strategy planning activity, what are the:
  - a. The main objectives of this activity?
  - b. How do you ensure that these objectives are met?
  - c. The key considerations that govern the process?
  - d. How does the organisation ensure that these considerations are taken into account?
5. Is the organisation's past/potential performance a key factor in:
  - a. Determining potential IS/IT?
  - b. Maintenance of existing IS/IT?
6. Is an IS/IT's past/potential performance a key factor in determining its continued maintenance or replacement?
  - a. Can you describe the process by which this is determined?
7. How critical is the IS strategy process to the determination of the level of investment in IS/IT?
  - a. Are comprehensive strategic plans a necessary requirement before any investment in IS/IT can be approved?

- b. Given the potentially dynamic nature of the banking industry, how do you deal with situations where a new product (which requires new IS/IT) is proposed after completion of the strategic planning process and resources have already been allocated?

### Organisational Context

This section seeks to establish the importance of organisational context and its role in the conceptual model. Specifically:

1. What is the context of a Financial Institution?
2. What impact does this context have on a Financial Institution?
3. Does this context affect performance, if so how?

### Questions

1. What are the major environmental issues of concern to your organisation?
  - a. In what ways do these affect the performance of your organisation?
  - b. How do they affect IS/IT investment decisions in your organisation?
2. Do you believe your environment to be very competitive?
  - a. Are IS/IT decisions in your organisation geared towards attaining competitive advantage?
  - b. Does IS/IT enable your organisation to be competitive?
  - c. Which IS/IT is/are critical to your organisation's ability to remain competitive and which is/are not?
3. Which aspects of your environment do you think present opportunities for
  - a. Competition?
  - b. Collaboration?
  - c. What role can IS/IT play in this regard?
4. Do you think that a particular IS/IT decision (internal) can "change" the environment (external) in which the organisation operates? What effect would this have on an organisation? Do you have any examples that you might like to share?

\*\*\*\*\***END**\*\*\*\*\*

## Section 4 – Qualitative Data Analysis And Displays

This section outlines the strategies and techniques that will be used to analyse data collected in the each case. This will enable the Researcher to follow a uniform and structured approach for each of the cases thereby increasing reliability and validity of the conclusions drawn.

### Overview of Data Analysis

Data from each organisation will be collected with the following objectives (for analysis) in mind:

1. Triangulation of data from multiple sources.
2. Triangulation of perspectives from multiple participants.

Figure 4.1 illustrates the chosen *modus operandi* for data analysis in this research project. This will applied to each case study.

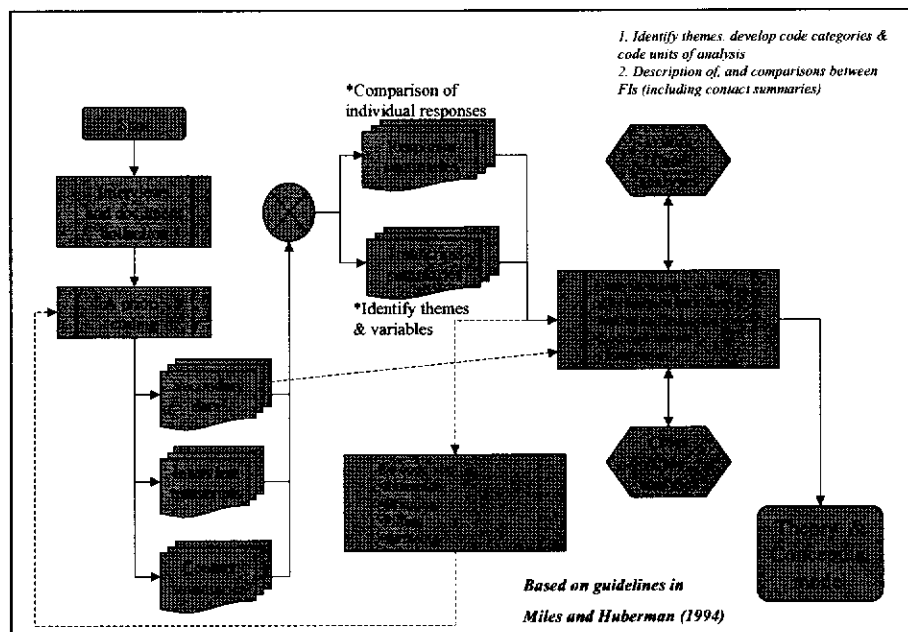


Figure 4.1: Overview of data analysis process as adapted from Miles and Huberman (1994)

Using the above logic, the following analysis will be conducted:

- “Within (Individual) case” analysis:
  - Descriptive information
  - Explanatory information
  - Individual case report
- “Cross case” analyses:
  - Descriptive information

- Explanatory information
- Cross case report

### **Descriptive Information**

Descriptive information on each organisation will be collected. This will include, but not limited to:

- Organisational size:
  - Demographic data such as: number of branches, number of employees etc
  - Financial data
- Organisational structure
- Market position and customer base

### **Explanatory Information**

Explanatory analysis of organisation including:

- Trend analysis
- Competitive analysis
- Environment (internal and external)

### **Individual Case Report**

Each case report will detail the findings in relation to that particular case. In each case the findings will be applied to the conceptual model leading to its refinement and further development.

### **Triangulation of Data from Multiple Sources**

In order to facilitate triangulation of data, multiple sources will be used as illustrated in Figure 4.2.

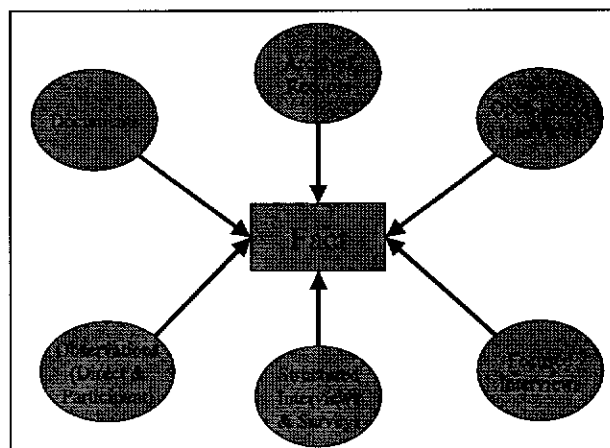


Figure 4.2: Convergence Of Data From Multiple Sources (Adapted Yin 1994)

Triangulation of Perspectives from Multiple Participants

In each instance, “Within case” analysis will be conducted followed by “Cross-case” analysis at each level. Finally “Cross sectoral” analysis will be performed. Figure 4.3 illustrates the analysis strategy.

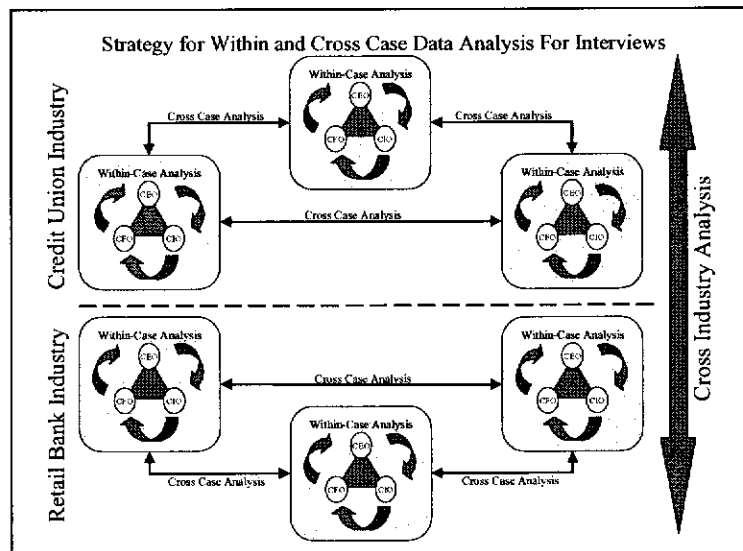


Figure 4.3: Overview Of Data Analysis Strategy

**Within-Case Analysis**

Figure 4.4 illustrates the approach to “Within Case” analysis for the interviews.

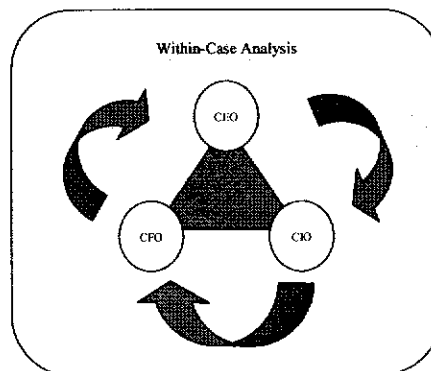


Figure 4.4: “Within Case” Analysis

Within each case, data obtained through structured interviews from each of the participants will be analysed and compared using a variety of analysis techniques to further refine the model.

### **Cross-Case Analyses**

Cross case analyses will mainly be comparative and with respect to each sectoral level of the industry. Descriptive and explanatory data will be compared for cases at each level (Figure 4.3) and a cross case report prepared. Further comparative analysis will be conducted with respect to the derived model for each case.

### **Cross Sectoral Analysis**

As shown in Figure 4.2, a *Cross Sectoral* analysis will be performed across the two industries to compare data from commercial/retail banks and credit unions

Data Schema

Table 4.1: Research Data Schema

Item	Target Component Of Conceptual Model	Data	Purpose	Source (Any Or All)
Identification of IS/IT portfolio components (In infrastructural, Transactional & Strategic)	Level Of Investment	<ul style="list-style-type: none"> <li>All Systems Core and non core including:                             <ul style="list-style-type: none"> <li>O/A network infrastructure</li> <li>ATM network</li> <li>Mainframe systems</li> <li>MIS/EIS</li> </ul> </li> <li>Corporate structure chart</li> <li>IS/IT function structure chart</li> </ul>	<ul style="list-style-type: none"> <li>Creation of system map to create an overview of Enterprise Architecture</li> <li>Creation of System Impact Grid to enable identification of individual components and assessment of their impact on organisation</li> </ul>	<ul style="list-style-type: none"> <li>Chief Information Officer</li> </ul>
Organisational Structures	Conversion Effectiveness	<ul style="list-style-type: none"> <li>Corporate structure chart</li> <li>IS/IT function structure chart</li> </ul>	<ul style="list-style-type: none"> <li>Analysis of structures in terms of their efficiency/effectiveness and fit for optimum system utilisation and/or success</li> </ul>	<ul style="list-style-type: none"> <li>Chief Financial Officer</li> <li>Chief Information Officer</li> </ul>
Key Performance Measures (both internal and external)	Organisational Performance	<p>Internal measure could include:</p> <ul style="list-style-type: none"> <li>Benchmarks based on O &amp; M type</li> <li>Time and Motion studies</li> <li>Number of transactions per hour (by system, per system)</li> <li>Network throughput</li> <li>Percentage uptimes</li> </ul> <p>External measures could include:</p> <ul style="list-style-type: none"> <li>Financial performance measures</li> <li>Finance Industry specific measure</li> </ul>	<ul style="list-style-type: none"> <li>Analysis of internal and external measures will enable the refinement of conceptual model in terms of identifying the most appropriate measures for organisational performance with specific reference to IS/IT</li> </ul>	<ul style="list-style-type: none"> <li>Chief Financial Officer</li> <li>Chief Information Officer</li> </ul>
IS/IT budget data (1997 – 2001 inclusive)	Level Of Investment	<p>IS/IT budget including:</p> <ul style="list-style-type: none"> <li>Hardware</li> <li>Software</li> <li>Licensing/rentals</li> <li>Training</li> <li>Other operating expenditure</li> </ul> <p>Corporate:</p> <ul style="list-style-type: none"> <li>IS/IT budget as a percentage of corporate budget</li> <li>IS/IT expenditure as a percentage of overall expenditure</li> <li>IS/IT expenditure as a percentage of revenue</li> <li>IS/IT asset value as a percentage of revenue</li> </ul>	<ul style="list-style-type: none"> <li>Time series (Trend) analysis for “Within case”, “Cross case” and “Cross sectoral” analyses</li> </ul>	<ul style="list-style-type: none"> <li>Chief Financial Officer</li> <li>Chief Information Officer</li> </ul>
Strategic Planning documentation	Strategic Information Systems Planning	<p>Documentation containing:</p> <ul style="list-style-type: none"> <li>Corporate strategy</li> <li>IS/IT strategy</li> </ul>	<ul style="list-style-type: none"> <li>Provide insight on both the influence and impact of strategic planning on IS/IT investment decisions</li> </ul>	<ul style="list-style-type: none"> <li>Chief Information Officer</li> <li>Chief Financial Officer</li> </ul>



Codes from Interview Transcripts

Table 4.2: Display matrix for identifying and coding patterns/themes from interview transcripts.

Category	Theme and Sub-themes	FI - 1	FI - 2	FI - 3	FI - 4
<b>Information Technology Portfolio</b>					
ISIT:	DEFINITION				
	Constitution				
	Importance & contribution				
	Meets org needs				
	Weaknesses				
ISIT:	BUDGET				
	Responsibility				
	Approval process				
	Request initiation				
	Request fulfillment				
	Acquisition process				
	Process limitations				
ISIT:	EXPENDITURE RATIOS				
	Training				
	Hardware				
	Software				
	Licensing				
ISIT:	BUDGET ALLOCATION				
	Operating expenditure/Recur exp				
	Capital Expenditure				
	New/ongoing projects				
	Year on year variation				
	Expenditure determination				
ISIT:	EXP CONTRIBUTION TO PERF				
	Positive				
	Negative				
ISIT:	EVALUATION				
	New systems				
	Existing systems				
	Post implementation				
	Ongoing activity				
	Financial methods				
	Multi-criteria methods				
	Ratio based methods				
	Portfolio based methods				
	Other methods				
	None				
	Effectiveness				
	Preferred method				

	Benefits realisation period				
ISIT:	SUCCESS				
	Success judgment				
ISIT:	INVESTMENT THRESHOLD				
	Threshold exists				
	Level defined				
ISIT:	COMPONENT CONTRIB TO PERF				
	Most contribution				
	Least contribution				
<b>Organisational performance</b>					
<b>Category</b>	<b>Theme and Sub-themes</b>				
OP:	STANDARD INDICATORS				
	Appropriate				
	Inappropriate				
OP:	INDICATORS USED				
	Internal key indicators				
	Benchmarking of indicators				
	External key indicators				
OP:	INDICATORS AND ISIT PERF				
OP:	INDICATORS AND ISIT DECISIONS				
	Criticality to ISIT decisions				
OP:	IS/IT INVEST PERF MONITORING				
OP:	IS/IT COST RECOVERY				
<b>Category</b>	<b>Theme and Sub-themes</b>				
OP:	ISIT SUCC AND ORG PERF				
	Positive				
	Negative				
OP:	IS/IT PERF RATING TO ORG PERF				
OP:	MOST IMPACT OF ISIT				
<b>Conversion Effectiveness</b>					
<b>Category</b>	<b>Theme and Sub-themes</b>				
CE:	ORGANSISATIONAL STRUCTURE				
CE:	IS/IT FUNCTION				
	Centralised				
	Distributed				
	Federalised				
	Ideal structure				
	Preferred structure				
CE:	SNR MMGT COMMITMENT				
	Affects ISIT utilisation				
	Affects org performance				
<b>Category</b>	<b>Theme and Sub-themes</b>				
CE:	ORG EXPERIENCE WITH				

	IS/IT				
	Foundation for IS/IT mmgt & use				
	Leads to better IS/IT use				
	Leads to improved OP				
CE:	ALL STAFF EXP WITH IS/IT				
	IS/IT staff				
	None IS/IT staff				
CE:	USER SATISFACTION WITH IS/IT				
	Internal staff				
	Customers				
CE:	SATISFACTION MEASURES				
	Effect on IS/IT performance				
	Critical to IS/IT decisions				
CE:	CULTURE				
	Politics				
	Communication				
	Influences IS/IT decisions				
CE:	MANAGERIAL ROLE				
	Influences IS/IT use				
	Influences IS/IT perf				
	Contributes to OP				
<b>Considerations for SISP</b>					
<b>Category</b>	<b>Theme and Sub-themes</b>				
SISP:	SISP PRESENT				
	SISP process description				
	SISP responsibility				
	SISP involvement				
	SISP roles				
	SISP frequency				
SISP:	SISP EFFECTIVENESS				
	SISP improvement				
SISP:	SEPARATE FROM CORP STRAT				
	Alignment				
SISP:	SISP PROCESS				
	Objectives				
	Monitoring				
	Governing considerations				
	Objectives taken into account				

SISP:	DETERMINING IS/IT PORTFOLIO				
	Past organisational performance				
	Potential organisational performance				
	MAINTAINING IS/IT PORTFOLIO				
	Past organisational performance				
	Potential organisational performance				
<b>Category</b>	<b>Theme and Sub-themes</b>				
SISP:	IS/IT PAST PERFORMANCE				
	IS/IT POTENTIAL PERFORMANCE				
SISP:	PROCESS INFLUENCE ON INVEST				
	Requirement for strategy plan				
	Dealing with dynamic environment				
<b>Context</b>					
<b>Category</b>	<b>Theme and Sub-themes</b>				
OC:	ENVIRONMENTAL ISSUES				
	Effect on organisation performance				
	Effect on investment decisions				
OC:	COMPETITION				
	Attaining Competitive Advantage				
	Enabling competitiveness				
	Critical to competitiveness				
OC:	OPPORTUNITIES				
	Competition				
	Collaboration				
	IS/IT role				
OC:	IS/IT INFLUENCE ON ENVIRON				

	Examples				
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### **3.0 Appendix 3 Survey Instrument and Statistical Tables**

Appendix 3-1	Survey Research Instrument
Appendix 3-2	Statistical Tables

Appendix 3-1

Survey Research  
Instrument

## Cover Letter

<<Date>>

<<first>> <<Last \_>>  
<<institution>>  
<<add1>>  
<<suburb>>  
<<state>> <<postcode>>

Dear Sir/Madam

**RE: Survey on IS/IT investment and organisational performance**

We are conducting research into the relationship between Information Systems/Information Technology (IS/IT) investment and organisational performance and would like to invite you to participate in a short survey.

As you know, investments in IS/IT form a large component of any Financial Institution's budget. However, there still are many lingering questions, for which definitive answers have yet to be provided such as: Exactly how much is the organisation spending on IS/IT?, What value/benefit are we getting from these investments?, How should we evaluate the various alternatives?, Why is it that IS/IT budgets continue to rise when IS/IT unit costs are said to be falling or staying relatively constant?, How can we regain our belief in the returns from our IS/IT investments? *These are important questions, which you have no doubt asked yourself at some point in time.*

The research project ultimately seeks to address these issues and in so doing enable Financial Institutions to better manage their IS/IT investments through the development of a model that clearly and simply defines the relationship between IS/IT investment and organisational performance. A summary of the results will be made available to all participants upon request. We would also like to reassure you on the issue of confidentiality as all responses are strictly anonymous do not require the identification of individuals or their organisations.

We therefore humbly request your participation in this very important project and ask that you complete and return the enclosed questionnaire by the **Friday 5<sup>th</sup>, March 2004**.

Lastly, we would like to take this opportunity to thank you in advance for your cooperation and participation in this project.

Yours faithfully

Hilangwa Maimbo  
Encl/ 1). Survey Questionnaire, 2) Reply paid envelo

Prof. Graham Pervan



**Instructions:**

1. Some questions require you to place a tick in the relevant box. Unless otherwise stated, select only one option only
2. Some questions require that you specify an answer on a scale of one (1) to five (5), where one (1) is lower end of the scale and five (5) the higher end of the scale. Please specify your answer by placing a circle around the appropriate number

**Demographic Data**

1. Age:.....
2. Gender                      Male                                            Female
3. What is the title of your current position?.....
4. How many years experience do you have in Information Systems? .....
5. Please indicate your highest level of education (choose one only):
 

PhD	<input type="checkbox"/>	Masters' Degree	<input type="checkbox"/>
Post-Graduate Diploma	<input type="checkbox"/>	Bachelor's Degree	<input type="checkbox"/>
Diploma/Certificate	<input type="checkbox"/>	High School	<input type="checkbox"/>

Other? (Please specify):  
 .....  
 .....  
 .....
6. Do you hold membership with any Professional Association, such as the Australian Computer Society?
 

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

If 'YES', what level of membership do you hold?

Institutional Member	<input type="checkbox"/>	Fellow	<input type="checkbox"/>
Member	<input type="checkbox"/>	Associate	<input type="checkbox"/>
Other Professional Organisations		Type of Membership	
.....		.....	
.....		.....	
.....		.....	

**Organisational Data**

1. What is the approximate number of employees in your organisation?.....
2. What is the ownership structure of your organisation?

- Australian-owned  Branch of Foreign Bank   
 Foreign Subsidiary

3. How would you best describe your organisational structure? (Choose only one in each pair)

- Hierarchical  or Flat   
 Centralised  or De-centralised   
 Matrix  or Divisional/Functional

4. What is the general management style used in your organisation? (Choose one only)

- Bureaucratic (Formal procedures and rules)   
 Fewer rules, greater autonomy   
 Co-operative and group oriented

5. Which of the following best describes your organisation's main activity? (Choose one only)

- Commercial/Retail banking  Credit Union   
 Building Society  Friendly Society   
 Life Insurance  General Insurance

Other? (Please specify):.....  
 .....  
 .....

6. From your experience, how long before the benefits of a given IS/IT are felt by your organisation? .....Years

**IS/IT Structure and Function**

1. Is there a specific IS/IT department in your organisation?  
 Yes  No

If "YES", then please indicate;

The number of employees in that department:.....  
 To whom does the IS/IT function report to directly?.....

2. Extent of Centralisation/Decentralisation of IS/IT Function:

- Centralised (All IS staff in one central location)   
 Federated (Centralised control, with dispersed autonomous subunits)

Decentralised (IS Staff dispersed throughout organisation)

3. From the list below, please indicate the role of IS/IT in your organisation and whether these activities are performed in-house or outsourced. Tick those roles (one or more) that apply to your IS/IT function

	<i>In-house</i>	<i>Outsourced</i>
Data Centre Management	<input type="checkbox"/>	<input type="checkbox"/>
Software Development	<input type="checkbox"/>	<input type="checkbox"/>
Technical/User Support	<input type="checkbox"/>	<input type="checkbox"/>
Acquisition (Software/Hardware)	<input type="checkbox"/>	<input type="checkbox"/>
Network Management	<input type="checkbox"/>	<input type="checkbox"/>
IS Budget (Preparation & control)	<input type="checkbox"/>	<input type="checkbox"/>
Project Management	<input type="checkbox"/>	<input type="checkbox"/>
IS Strategy Planning	<input type="checkbox"/>	<input type="checkbox"/>

Other? (Please specify):

.....  
 .....  
 .....

4. What is the position of the Head of the IS/IT department relative to the Chief Executive officer, i.e. how many reporting levels are there between the IS/IT Head and the Chief Executive Officer?

Direct Link	<input type="checkbox"/>	One level	<input type="checkbox"/>
Two Levels	<input type="checkbox"/>	Three or more levels	<input type="checkbox"/>

5. Approximate annual budget of IS/IT Unit:

.....

6. Approximate annual expenditure on IS/IT by the organisation?

.....  
 .....

7. On average, approximately what proportion of your IS/IT budget is allocated to:

Training:.....%	Hardware:.....%
Software:.....%	Licensing etc:.....%

8. On average, approximately how much of your total IS/IT budget is allocated to

Operating expense (recurrent expenditure):.....%
Capital expenditure (including new investments):.....%
New or ongoing projects:.....%

9. To what extent do you agree with the following statement (*1 = Strongly disagree, 5 = Strongly agree*):

There is a minimum IS investment threshold (Total IS expenditure as a ratio of Total Expenditure) required for our organisation to remain competitive?

1 2 3 4 5

10. Please quantify this threshold.....%

**IS Investment**

1. To what extent do you agree that IS expenditure (as represented by Infrastructure, Transaction Processing Systems and Management Information Systems/Decision Support Systems) should be considered and treated as investments? (*1 = Strongly disagree, 5 = Strongly agree*)

1 2 3 4 5

2. Rate the relative importance of the following groups of systems (*1 = No Importance, 5 = High importance*)

Infrastructure (Network, Office Automation etc)	1	2	3	4	5
Core/Transaction Processing Systems	1	2	3	4	5
Management Information/Decision Support Systems	1	2	3	4	5

3. Rate the level of contribution of each of the following systems to organisational performance (*1 = No contribution, 5 = Most contribution*)

Infrastructure	1	2	3	4	5
Core/Transaction Processing Systems	1	2	3	4	5
Management Information/Decision Support Systems	1	2	3	4	5

4. To what extent does your organisation's IS/IT portfolio meet the needs of the organisation? (*1 = does not meet needs, 5 = Meets needs fully*)

Internally	1	2	3	4	5
Externally	1	2	3	4	5

5. Indicate the level of investment that has been directed at each aspect of the IS/IT portfolio to date. (*1 = Low investment, 5 = High investment*)

Infrastructure	1	2	3	4	5
Core/Transaction Processing Systems	1	2	3	4	5
Management Information/Decision Support Systems	1	2	3	4	5

6. Rate the importance of performing evaluations in order to manage the benefits of IS/IT investment to your organisation (*1 = Not important, 5 = Very important*):

For new systems	1	2	3	4	5
For existing systems	1	2	3	4	5
As a post implementation activity	1	2	3	4	5
As an ongoing activity	1	2	3	4	5

7. Which of the following methods are used by your organisation to evaluate and/or justify potential IS/IT investments? (Choose one or more)

- |                     |                          |                         |                          |
|---------------------|--------------------------|-------------------------|--------------------------|
| Financial methods   | <input type="checkbox"/> | Multi-criteria methods  | <input type="checkbox"/> |
| Ratio based methods | <input type="checkbox"/> | Portfolio based methods | <input type="checkbox"/> |
| None                | <input type="checkbox"/> |                         |                          |

8. Rate the effectiveness of the following methods with respect to IS investment decision making (1 = Not very effective, 5 = Very effective)

Financial methods (e.g. NPV, IRR etc)	1	2	3	4	5
Multi-criteria methods	1	2	3	4	5
Ratio based methods	1	2	3	4	5
Options Theory based methods	1	2	3	4	5

9. Overall, how would you rate the impact of your IS investments on organisational performance? (1 = No impact, 5 = High impact)

1	2	3	4	5
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10. List the ratios (if any) that are used by your organisation as indicators of the level of IS investment (eg IT budget/Total budget, IT assets/Total assets, etc)

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11. To what extent do you agree that these ratios are: (1 = Strongly disagree, 5 = Strongly agree):

Appropriate for IS/IT management?	1	2	3	4	5
Linked to organisational performance	1	2	3	4	5

12. What mechanisms do you have in place to monitor IS/IT investment/expenditure (e.g. Activity Based Costing, Charge-back etc)?

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**Organisational Performance**

1. What are the Key Performance Indicators (KPIs) used by your organisation to report on organisational performance *internally*?

.....

.....

.....

.....

2. What are the Key Performance Indicators (KPIs) used to report on organisational performance *externally*, eg to regulators, shareholders, members and/or general public?

.....

.....

.....

.....

3. To what extent do these KPIs capture/show the contribution of IS investment to organisational performance? (1 = *Not at all*, 5 = *Completely*):

1      2      3      4      5

4. To what extent do you agree that KPIs: (1 = *Strongly disagree*, 5 = *Strongly agree*)

are an important consideration when making IS/IT decisions such as the acquisition of new IS/IT, new projects or the retirement of existing IS/IT?

1    2      3      4      5

5. How would you describe the relationship between IS/IT investments and organisational performance? (*Choose one only*)

Positive, Direct	<input type="checkbox"/>	Positive, Indirect	<input type="checkbox"/>
Negative, Direct	<input type="checkbox"/>	Negative, Indirect	<input type="checkbox"/>
No relationship	<input type="checkbox"/>		

6. To what extent do you agree that IS/IT investments have a direct impact on: (1 = *Strongly disagree*, 5 = *Strongly agree*)

Operations?	1	2	3	4	5
Product Delivery?	1	2	3	4	5
Customer Service?	1	2	3	4	5
Staff?	1	2	3	4	5

Other (Please specify): .....

.....

.....

.....

.....

<b>Managerial Effectiveness</b>
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1. To what extent do you agree that the role of senior management in your organisation has the following effects? (1 = Strongly disagree, 5 = Strongly agree):

Impacts on the development of effective/efficient IS/IT?	1	2	3	4	5
Directly influences IS/IT investment decisions	1	2	3	4	5
Affects the utilisation and performance of IS/IT?	1	2	3	4	5

2. To what extent do you agree with each of the following with respect to your organisation? (1 = Strongly disagree, 5 = Strongly agree):

Technology is generally well received	1	2	3	4	5
Internal politics influence IS/IT decisions	1	2	3	4	5
Good change management is practiced	1	2	3	4	5
Staff encouraged to learn/use technology	1	2	3	4	5

3. To what extent do you agree that user satisfaction with your technology is high? (1 = Strongly disagree, 5 = Strongly agree):

For internal users, i.e. employees?	1	2	3	4	5
For external users, i.e. customers, members etc?	1	2	3	4	5

4. To what extent is "satisfaction" a critical consideration during IS/IT investment decision processes? (1 = None, 5 = Critical):

	1	2	3	4	5
--	---	---	---	---	---

5. List the formal mechanisms for measuring satisfaction levels with respect to IS/IT as utilised by your organisation.

Internally:.....	Externally:.....
.....	.....
.....	.....
.....	.....

6. To what extent do you agree with each of the following regarding the organisational structure (1 = Strongly disagree, 5 = Strongly agree):

Organisational structure is ideal	1	2	3	4	5
Organisational structure facilitates management of IS/IT	1	2	3	4	5
Organisational structure influences IS/IT investment decisions	1	2	3	4	5

7. Rate the "level of experience" of your organisation with respect to IS/IT (1 = Low, 5 = High):

	1	2	3	4	5
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8. To what extent do you agree with each of the following regarding organisational experience (OE) with respect to IS/IT? (1 = Strongly disagree, 5 = Strongly agree):

OE provides a good foundation for the management IS/IT	1	2	3	4	5
OE provides a good foundation for the utilisation of IS/IT	1	2	3	4	5
OE leads to better IS/IT investment decisions	1	2	3	4	5

OE leads to better IS/IT performance	1	2	3	4	5
OE leads to better organisational performance	1	2	3	4	5

**Considerations for Strategic Information Systems Planning**

1. To what extent do you agree with each of the following with respect to your organisation? (1 = Strongly disagree, 5 = Strongly agree):

Formal and documented IS/IT strategy exists	1	2	3	4	5
IS/IT strategy process is separate from the corporate strategy	1	2	3	4	5
IS/IT strategy and business strategy are well aligned	1	2	3	4	5
IS/IT strategy necessary for IS investment	1	2	3	4	5
IS/IT strategy process is a regular activity	1	2	3	4	5
Current IS/IT strategy is effective	1	2	3	4	5

2. To what extent do you agree that each of the following is a critical consideration when conducting IS/IT strategy planning in your organisation? (1 = Strongly disagree, 5 = Strongly agree):

Definition of IS/IT	1	2	3	4	5
Tracking of IS/IT investments	1	2	3	4	5
Factors influencing investment decisions regarding IS/IT	1	2	3	4	5
Originators of IS/IT initiatives	1	2	3	4	5
Calculation of return on IS/IT investments	1	2	3	4	5
Alignment of IS/IT investment with Corporate strategy/goals	1	2	3	4	5
IS/IT for competitive advantage	1	2	3	4	5
Efficient/Effective utilisation of IS resources by organisation	1	2	3	4	5
Development of policies for IS/IT	1	2	3	4	5

3. To what extent do you agree with each of the following statements with respect to your organisation? (1 = Strongly disagree, 5 = Strongly agree):

Our past/potential performance a key factor in determining potential IS/IT investment	1	2	3	4	5
Our past/potential performance a key factor in maintenance of existing IS/IT?	1	2	3	4	5

**Environment**

1. To what extent do you agree with each of the following statements regarding your organisations environment? (1 = Strongly disagree, 5 = Strongly agree):

It is highly competitive	1	2	3	4	5
IS/IT investments used to achieve competitive advantage	1	2	3	4	5
There are opportunities for collaboration in IS/IT	1	2	3	4	5
Stakeholders influence our organisation's IS/IT decisions	1	2	3	4	5



*Appendix 3 Survey Instrument and Statistical Tables*

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IS/IT investment outcomes influence the environment	1	2	3	4	5
Our environment influences IS/IT investment decisions	1	2	3	4	5
It is highly regulated	1	2	3	4	5
Regulatory framework can affect IS/IT investment decisions	1	2	3	4	5
Mandatory IS/IT investments result from regulation	1	2	3	4	5

Comments?

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*Thank you for participating in this short survey. Please return completed questionnaire via the reply paid envelope*

**\*\*\*\*\*END OF QUESTIONNAIRE\*\*\*\*\***

# Appendix 3-2

## Statistical Tables

**Table A3.1: Respondents IS Experience (years)**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	1	4.8	5.0	5.0
	5	2	9.5	10.0	15.0
	10	2	9.5	10.0	25.0
	11	1	4.8	5.0	30.0
	12	2	9.5	10.0	40.0
	14	1	4.8	5.0	45.0
	20	3	14.3	15.0	60.0
	23	1	4.8	5.0	65.0
	24	1	4.8	5.0	70.0
	25	1	4.8	5.0	75.0
	29	1	4.8	5.0	80.0
	32	1	4.8	5.0	85.0
	33	1	4.8	5.0	90.0
	35	1	4.8	5.0	95.0
	41	1	4.8	5.0	100.0
	Total	20	95.2	100.0	
Missing	System	1	4.8		
Total		21	100.0		

**Table A3.2: Respondents level of education**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Master's degree	2	9.5	9.5	9.5
	Post Graduate Diploma	3	14.3	14.3	23.8
	Bachelor's degree	7	33.3	33.3	57.1
	Diploma/Certificate	6	28.6	28.6	85.7
	High School	3	14.3	14.3	100.0
	Total	21	100.0	100.0	

**Table A3.3: Annual IS Budgets**

	N	Minimum	Maximum	Mean	Std. Deviation
Annual expenditure	20	20000	40000000	2976400.00	8803322.712
Valid N (listwise)	20				

**Table A3.4: Link to CEO**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Direct link	9	42.9	50.0	50.0
	One level	8	38.1	44.4	94.4
	Two levels	1	4.8	5.6	100.0
	Total	18	85.7	100.0	
Missing	System	3	14.3		
Total		21	100.0		

**Table A3.5: IS investment threshold**

	N	Minimum	Maximum	Mean	Std. Deviation
IS threshold value	13	5.00	40.00	16.8846	10.17381
Valid N (listwise)	13				

**Table A3.6: Existence of IS threshold**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	4.8	4.8	4.8
	2	3	14.3	14.3	19.0
	3	5	23.8	23.8	42.9
	4	8	38.1	38.1	81.0
	Strongly Agree	4	19.0	19.0	100.0
Total		21	100.0	100.0	

**Table A3.7: Importance of IT portfolio components**

	N	Minimum	Maximum	Mean	Std. Deviation
Importance of Infrastructure	20	1	5	4.15	.988
Importance of TPS	20	2	5	4.65	.745
Importance of MIS/DSS	20	1	5	3.90	1.021
Valid N (listwise)	20				

**Table A3.8: Contribution of IT portfolio components**

	N	Minimum	Maximum	Mean	Std. Deviation
Contribution of Infrastructure	20	1	5	3.60	.883
Contribution of TPS	21	2	5	4.48	.814
Contribution of MIS/DSS	21	1	5	3.71	1.007
Valid N (listwise)	20				

**Table A3.9: Appropriateness of IS management ratios**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	4	19.0	40.0	40.0
	3	1	4.8	10.0	50.0
	4	3	14.3	30.0	80.0
	Strongly agree	2	9.5	20.0	100.0
Total		10	47.6	100.0	
Missing	System	11	52.4		
Total		21	100.0		

**Table A3.10: Linkage of ratios to organisational performance**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	4	19.0	40.0	40.0
	3	2	9.5	20.0	60.0
	4	3	14.3	30.0	90.0
	Strongly agree	1	4.8	10.0	100.0
	Total	10	47.6	100.0	
Missing	System	11	52.4		
Total		21	100.0		

**Table A3.11: Internal KPIs utilised by FIs**

Category label	Code	Count	Pct of Responses	Pct of Cases
Loans growth	1	2	4.9	15.4
Deposit growth	2	1	2.4	7.7
Total Asset growth	3	4	9.8	30.8
Profitability	4	3	7.3	23.1
Customer satisfaction	6	1	2.4	7.7
Staff satisfaction	8	2	4.9	15.4
Return On Equity	9	1	2.4	7.7
Cost to Income ratio	10	2	4.9	15.4
Long term growth	11	1	2.4	7.7
Liquidity ratio	13	3	7.3	23.1
Capital adequacy ratio	14	2	4.9	15.4
Return On Assets	15	2	4.9	15.4
Product usage	16	1	2.4	7.7
Expenditure	17	2	4.9	15.4
Total expenses/Average expenses	20	1	2.4	7.7
Interest margin	21	2	4.9	15.4
Delinquency	22	2	4.9	15.4
Operating expense/income	23	1	2.4	7.7
Operating expense/total assets	24	1	2.4	7.7
Net Profit	26	1	2.4	7.7
Budget P/L performance	29	1	2.4	7.7
Complaints ratio	33	1	2.4	7.7
Non Interest Income/Total Income	35	1	2.4	7.7
Expenses/Average Assets	36	1	2.4	7.7
System Uptime	37	1	2.4	7.7
Staff Turnover	38	1	2.4	7.7
	Total responses	41	100.0	315.4

**Table A3.12: External KPIs utilised by FIs**

Category label	Code	Count	Pct of Responses	Pct of Cases
Loans growth	1	3	5.0	20.0
Deposit growth	2	2	3.3	13.3
Total Asset growth	3	4	6.7	26.7
Profitability	4	5	8.3	33.3
3-BL (Social, Environment & Financial)	5	1	1.7	6.7
Share price	7	1	1.7	6.7
Return On Equity	9	2	3.3	13.3
Cost to Income ratio	10	2	3.3	13.3
Long term growth	11	2	3.3	13.3
Gap	12	1	1.7	6.7
Liquidity ratio	13	4	6.7	26.7
Capital adequacy ratio	14	8	13.3	53.3
Return On Assets	15	3	5.0	20.0
Financial reporting	18	1	1.7	6.7
NPAT/Average assets	19	2	3.3	13.3
Total expenses/Average expenses	20	1	1.7	6.7
Interest margin	21	3	5.0	20.0
Delinquency	22	2	3.3	13.3
Operating expense/income	23	2	3.3	13.3
Operating expense/total assets	24	1	1.7	6.7
Net Profit	26	1	1.7	6.7
Capital/risk weighted assets	27	1	1.7	6.7
Capital/risk weighted assets	28	1	1.7	6.7
Member base	30	1	1.7	6.7
Asset quality	31	1	1.7	6.7
Complaints ratio	33	1	1.7	6.7
APRA KPIs**	34	1	1.7	6.7
Non Interest Income/Total Income	35	1	1.7	6.7
Expenses/Average Assets	36	1	1.7	6.7
Loan Delinquency	39	1	1.7	6.7
Total responses		60	100.0	400.0

\*APRA KPIs are financial KPIs that include all of the KPIs in the table

**Table A3.14: Intermediary Variables**

	N	Minimum	Maximum	Mean	Std. Deviation
IS investment impact on Operations	21	2	5	4.38	.805
IS investment impact on Product Delivery	21	1	5	4.24	.995
IS investment impact on Customer Service	21	2	5	4.00	.837
IS investment impact on Staff	21	2	5	3.90	.700
Valid N (listwise)	21				

**Table A3.15: Internal Satisfaction Measures**

Pct of Category label Cases	Code	Count	Pct of Responses	Pct of Cases
Word of mouth	1	1	5.0	7.1
Staff survey	2	8	40.0	57.1
Service Level Agreements	3	2	10.0	14.3
Staff Interviews	4	1	5.0	7.1
Day to day processing	5	1	5.0	7.1
Performance measurement	6	1	5.0	7.1
Incident responsiveness	7	2	10.0	14.3
Complain monitoring	8	2	10.0	14.3
System downtime	9	1	5.0	7.1
System uptime	10	1	5.0	7.1
		-----	-----	-----
	Total responses	20	100.0	142.9

7 missing cases; 14 valid cases

**Table A3.16: External Satisfaction Measures**

Category label	Code	Count	Pct of Responses	Pct of Cases
Customer Survey	1	7	38.9	53.8
Complaint monitoring	2	3	16.7	23.1
Member feedback	3	5	27.8	38.5
Increase in usage	4	1	5.6	7.7
System downtime	5	1	5.6	7.7
System uptime	6	1	5.6	7.7
		-----	-----	-----
	otal responses	18	100.0	138.5

8 missing cases; 13 valid cases

**Table A3.17: Reponses relating to 'Considerations for SISP'**

	N	Minimum	Maximum	Mean	Std. Deviation
Definition of IS	21	1	4	3.05	.973
Tracking of IS investment	20	1	5	3.25	1.020
Factors influencing IS decisions	21	1	5	3.29	1.146
Orginator of IS initiatives	21	1	4	3.00	1.049
Calculation of return on IS investment	21	1	5	3.19	1.123
Alignment of IS investment with CS goals	21	1	5	3.86	1.153
IS investment for competitive advantage	21	1	5	3.67	1.155
Effective/efficient utilisation of IS resources	21	1	5	3.67	1.017

Development of policies for IS	21	1	4	3.10	1.044
Valid N (listwise)	20				

**Table A3.18: Influence and impact of Context on IS investment and organisational performance relationship**

	N	Minimum	Maximum	Mean	Std. Deviation
Environment highly competitive	21	1	5	3.86	.964
IS investments used for competitive advantage	21	1	5	3.33	1.111
IS provides opportunities for collaboration	21	2	5	3.86	.793
Stakeholders influence FI's IS investment decisions	21	1	5	3.62	1.161
Environment influences IS decisions	21	1	5	3.24	1.044
Environment is highly regulated	21	1	5	3.62	1.024
Regulatory framework influences IS decisions	21	1	5	4.14	1.014
Regulatory framework influences IS decisions	21	1	5	3.95	.973
Mandatory IS investments result from regulation	21	1	5	3.76	1.044
Valid N (listwise)	21				

**Table A3.19: Distribution of FIs in Sample**

Organisation's main activity			
		Frequency	Percent
Valid	Commercial/Retail banking	2	9.5
	Credit Union	16	76.2
	Building Society	1	4.8
	Friendly Society	1	4.8
	Total	20	95.2
Missing	System	1	4.8
Total		21	100.0



**Table A3.20: Internal KPIs used in commercial/retail banks**

Category label	Code	Count	Pct of Responses	Pct of Cases
Loans growth	1	1	12.5	50.0
Deposit growth	2	1	12.5	50.0
Total Asset growth	3	1	12.5	50.0
Profitability	4	1	12.5	50.0
Customer satisfaction	6	1	12.5	50.0
Share price	7	1	12.5	50.0
Staff satisfaction	8	1	12.5	50.0
Return On Equity	9	1	12.5	50.0
		-----	-----	-----
Total responses		8	100.0	400.0
0 missing cases; 2 valid cases				

**Table A3.21: External KPIs used in commercial/retail banks**

Category label	Code	Count	Pct of Responses	Pct of Cases
Loans growth	1	1	12.5	50.0
Deposit growth	2	1	12.5	50.0
Total Asset growth	3	1	12.5	50.0
Profitability	4	1	12.5	50.0
Share price	7	1	12.5	50.0
Return On Equity	9	1	12.5	50.0
Cost to Income ratio	10	1	12.5	50.0
Long term growth	11	1	12.5	50.0
		-----	-----	-----
Total responses		8	100.0	400.0
0 missing cases; 2 valid cases				

**Table A3.22: Internal KPIs used in credit unions**

Category label	Code	Count	Pct of Responses	Pct of Cases
Loans growth	1	2	3.3	15.4
Deposit growth	2	1	1.7	7.7
Total Asset growth	3	3	5.0	23.1
Profitability	4	4	6.7	30.8
3-BL (Social, Environment & Financial)	5	1	1.7	7.7
Customer satisfaction	6	1	1.7	7.7
Staff satisfaction	8	1	1.7	7.7
Return On Equity	9	2	3.3	15.4
Cost to Income ratio	10	2	3.3	15.4
Long term growth	11	1	1.7	7.7
Gap	12	1	1.7	7.7

Appendix 3 Survey Instrument and Statistical Tables

Liquidity ratio	13	4	6.7	30.8
Capital adequacy ratio	14	9	15.0	69.2
Return On Assets	15	4	6.7	30.8
Product usage	16	2	3.3	15.4
Expenditure	17	1	1.7	7.7
NPAT/Average assets	19	2	3.3	15.4
Total expenses/Average expenses	20	1	1.7	7.7
Interest margin	21	3	5.0	23.1
Delinquency	22	2	3.3	15.4
Operating expense/income	23	3	5.0	23.1
Operating expense/total assets	24	2	3.3	15.4
Net Profit	26	1	1.7	7.7
Budget P/L performance	29	1	1.7	7.7
Member base	30	1	1.7	7.7
Complaints ratio	33	1	1.7	7.7
Non Interest Income/Total Income	35	1	1.7	7.7
Expenses/Average Assets	36	1	1.7	7.7
System Uptime	37	1	1.7	7.7
Staff Turnover	38	1	1.7	7.7
		-----	-----	-----
	Total responses	60	100.0	461.5
3 missing cases; 13 valid cases				

**Table A3.23: External KPIs used in credit unions**

Category label	Code	Count	Pct of Responses	Pct of Cases
Loans growth	1	2	3.9	16.7
Deposit growth	2	1	2.0	8.3
Total Asset growth	3	3	5.9	25.0
Profitability	4	4	7.8	33.3
3-BL (Social, Environment & Financial)	5	1	2.0	8.3
Return On Equity	9	1	2.0	8.3
Cost to Income ratio	10	1	2.0	8.3
Long term growth	11	1	2.0	8.3
Gap	12	1	2.0	8.3
Liquidity ratio	13	4	7.8	33.3
Capital adequacy ratio	14	8	15.7	66.7
Return On Assets	15	3	5.9	25.0
Financial reporting	18	1	2.0	8.3
NPAT/Average assets	19	2	3.9	16.7
Total expenses/Average expenses	20	1	2.0	8.3
Interest margin	21	3	5.9	25.0
Delinquency	22	2	3.9	16.7
Operating expense/income	23	2	3.9	16.7
Operating expense/total assets	24	1	2.0	8.3
Net Profit	26	1	2.0	8.3

*Appendix 3 Survey Instrument and Statistical Tables*

Capital/risk weighted assets	27	1	2.0	8.3
Capital/risk weighted assets	28	1	2.0	8.3
Member base	30	1	2.0	8.3
Asset quality	31	1	2.0	8.3
Complaints ratio	33	1	2.0	8.3
Non Interest Income/Total Income	35	1	2.0	8.3
Expenses/Average Assets	36	1	2.0	8.3
Loan Delinquency	39	1	2.0	8.3
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	Total responses	51	100.0	425.0
4 missing cases; 12 valid cases				

**Table A3.24: Mean ratings of senior management commitment factor of Managerial effectiveness component**

FI types		Snr management Impacts on development of IS	Snr mngt influence IS investment decisions	Snr mngt affects utilisation of IS
Commercial/ Retail banks	Mean	4.00	4.50	4.00
	N	2	2	2
	Std. Deviation	1.414	0.707	0.000
Credit Unions	Mean	3.81	3.81	3.53
	N	16	16	15
	Std. Deviation	1.109	0.750	0.915
Other	Mean	3.00	4.00	3.33
	N	3	3	3
	Std. Deviation	1.000	1.000	0.577
Total	Mean	3.71	3.90	3.55
	N	21	21	20
	Std. Deviation	1.102	0.768	0.826

**Table A3.25: Mean ratings of organisational structure factor of Managerial effectiveness component**

FI types		Organisational structure is ideal	Org structure facilitates IS management	Org structure influences IS decision making
Commercial/ Retail banks	Mean	3.50	3.00	3.00
	N	2	2	2
	Std. Deviation	0.707	0.000	0.000
Credit Unions	Mean	3.06	3.13	3.19
	N	16	16	16
	Std. Deviation	0.854	1.025	0.911
Other	Mean	4.00	3.00	2.67
	N	3	3	3
	Std. Deviation	0.000	1.732	1.528
Total	Mean	3.24	3.10	3.10
	N	21	21	21

	Std. Deviation	0.831	1.044	0.944
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**Table A3.26: Mean ratings of user satisfaction factor of Managerial effectiveness component**

FI types		Internal satisfaction with IT	External satisfaction with IT	Importance of satisfaction in IS decision making
Commercial/ Retail banks	Mean	3.00	3.00	3.50
	N	2	2	2
	Std. Deviation	0.000	1.414	0.707
Credit Unions	Mean	3.81	4.00	3.63
	N	16	15	16
	Std. Deviation	0.911	0.655	0.885
Other	Mean	4.00	2.67	3.67
	N	3	3	3
	Std. Deviation	0.000	1.528	0.577
Total	Mean	3.76	3.70	3.62
	N	21	20	21
	Std. Deviation	0.831	0.979	0.805

**Table A3.27: Mean ratings of culture factor of Managerial effectiveness component**

FI types		Acceptance of technology	Impact of internal politics	Good change management practised	Learning of IS usage encouraged
Commercial/ Retail banks	Mean	3.50	2.00	2.50	3.00
	N	2	2	2	2
	Std. Deviation	0.707	1.414	0.707	1.414
Credit Unions	Mean	3.69	2.88	3.25	3.81
	N	16	16	16	16
	Std. Deviation	0.873	1.360	0.775	0.655
Other	Mean	4.33	1.67	3.33	4.00
	N	3	3	3	3
	Std. Deviation	0.577	1.155	1.155	0.000
Total	Mean	3.76	2.62	3.19	3.76
	N	21	21	21	21
	Std. Deviation	0.831	1.359	0.814	0.700

**Table A3.28: Mean ratings of organisational experience factor of Managerial effectiveness component**

FI types		OE provides good foundation for IS management	OE provides good foundation for IS utilisation	OE leads to better IS investment decisions	OE leads to better IS performance	OE leads to better organisational performance
Commercial/ Retail banks	Mean	4.00	3.50	4.00	4.00	4.00
	N	2	2	2	2	2
	Std. Deviation	0.000	0.707	0.000	0.000	0.000
Credit Unions	Mean	3.38	3.13	3.50	3.38	3.75
	N	16	16	16	16	16
	Std. Deviation	0.885	0.885	1.095	0.957	0.931
Other	Mean	4.00	3.00	3.00	3.00	4.00
	N	3	3	3	3	3
	Std. Deviation	0.000	1.732	1.732	1.732	1.000
Total	Mean	3.52	3.14	3.48	3.38	3.81
	N	21	21	21	21	21
	Std. Deviation	0.814	0.964	1.123	1.024	0.873

## **4.0 Appendix 4 – Sample Interview Data**

Appendix 4-1	Sample Transcripts
Appendix 4-2	Field Notes and Observations

# Appendix 4-1:

## Sample Transcripts

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Interview Transcript – Participant 1

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Participant: P1  
Position: General Manager  
Organisation: CUC1  
Date: Friday 31 May 2002  
Location: CUC1 Head Office

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HM: To start off with and before we even look at the questionnaire, perhaps you can just give me an overview of CUC1?

P1: University Credit Society was founded in 1964. It is a traditional credit society and it operates on the traditional credit union values of providing a service to members. It is not driven by maximising profitability though it is recognised that the credit union need to make a profit in order to accumulate capital as we need capital to meet the capital adequacy ratios required by the prudential standards.

HM: In terms of its size, how big is CUC1?

P1: The balance sheet is \$82 million worth of assets, staff loans including the travel section.

HM: So it's a fairly small organisation compared to the rest of the players?

P1: {Laugh} Um it certainly has its implications, you know, for the management structure and so {pause} you know the management structure is relatively very thin. You know, we certainly don't have any specialists in the various areas. So, you know, the management here tends to be the "jack of all trades" and master of some.

HM: Okay. All right, um, lets look at the first question on the questionnaire. How do you define IS/IT {in your organisation}?

P1: The way we define it is, you know, the hardware; that's the PCs, the core banking system (which is outsourced to The System Works, TSW), um the software, um plus the communications network that we've set up.

HM: So its pretty much everything that goes towards the provision of information in your organisation?

P1: Um, yes, yes.

HM: Given the fact that you do have multiple systems in your organisation. If I were to present to you a model or a perspective that we have an infrastructure level (typically telecommunications, PCs, OA etc), a transactional or tactical level (where you have your core banking systems and your value transaction being processed) and a higher strategic level where you might have MIS, EIS etc,



how would you rate your systems in those categories in terms of contribution to performance. For rating, I'd say lets use a scale of (1) not very important to (5) very important.

P1: So three levels? The top level was the strategic level, which was the provision of MIS info to management. I mean that is important, I'd give it a 4 out of 5.

HM: The next level is the transactional level, your core banking systems, your value transactions etc.

P1: That would be a 5 out of 5.

HM: And the bottom level, which is your telecommunications, your hardware and your office automation software?

P1: That would be a 5 out of 5 as well. I mean, the latter two you just could not do without. We could survive without MIS for a short while I guess that would be why I gave it a 4 out of 5 rather than a 5 out of 5.

HM: Alright we move on to the next question. Um, looking at your current IS/IT architecture, do you feel that it meets the needs of the organisation or do you think that it might need improvement?

P1: I mean it meets the needs of the organisation. Although like any other IS/IT architecture it could be improved. You know, our current core banking software is 25 to 30 years old. I mean it is not structured in a way for actually, um, I mean it is not structured as a relational database. So it is difficult to extract member information.

HM: Given the size of your organisation and you did mention earlier that there are no specialists per se, who is actually responsible for the preparations of IS/IT budgets?

P1: That would be P2 and myself, P2 preparing it and myself signing off. When it comes to preparation of budgets we don't have separate cost centres, so there is no IT department for which we would be doing a budget. So we are just doing one budget for the organisation of which obviously IT costs are part of the expense budget and its P2 and myself sitting down to prepare that budget.

HM: In terms of say for instance, IS/IT requests or when there is a need to upgrade the system in one way or another, where do these requests come from? Who initiates such requests?

P1: At various levels in the organisation. You know, requests for new PCs, um maybe new software on the PCs. They would come from the staff themselves, through to P2 who can actually sign it off. If the expenditure is above P2's discretionary level, then it would be signed off by myself. The more significant IT changes would probably be generated by P2 and myself.

HM: Are you happy with the process as it pertains right now or do you think it could be improved?

P1: No, I am quite happy with it. It works.

HM: There's some issues here in terms of some figures, but that's more P2's area and he has promised that he will provide those to me in our next meeting. So we'll skip all that and if I have any questions that might relate to you, I can always email or phone you?

P1: You can indeed.

HM: Question 5 on the questionnaire. Do you believe that this expenditure that you are making in IS/IT contributes to performance?

P1: Definitely, I mean we could not perform without our investments in IT. If there were no IT, there would be no CUC1.

HM: Based on that fact, are you required in any way to perhaps conduct evaluations of your IS/IT with respect to performance or vice versa?

P1: No, like I said in a small organisation like this, we just don't do those types of evaluations. You know, the evaluations are; the system is working or the system is not working; how many problems are we having with the system? Its almost like an ongoing evaluation based on day to day performance.

HM: Its more informal {subjective} than anything else?

P1: That's right.

HM: Um would you like to see a situation where that process was more formalised?

P1: Not particularly, I mean I don't believe you need a formalisation in an organisation as small as this. It may be appropriate in a larger organisation, not in one of this size.

HM: Given your perspective on IS/IT, how would you judge the success of a system in your organisation? At which point would you say you have succeeded or failed with an IS/IT?

P1: Probably just on how many issues or problems there are on an ongoing basis day-to-day.

HM: So do you look at it more from a cost perspective or from a benefits perspective? Some organisations, if I may say, look at it in terms of; if the project or something is done and it exceeds the proposed budget then it might be considered a failure.

P1: Again, you know, that's more of a larger organisation. In a small organisation like this, for most of our IS/IT architecture, we don't have a choice. I mean we

are a taker because we are a small credit union. We use the core banking system that all credit unions have and there isn't really any alternative at the right price for ourselves. So, you know, we have to take that particular software. Likewise being a small organisation, like ourselves, um we often outsource the running of the hardware. Again there is not much of a choice in that larger organisations such as CUC2, United, um, Police and Nurses, they all outsourced the running of their Hardware to this organisation { }. So we are like a price taker, we are a taker of the service. We've not much choice in evaluating the success. It's really just on a day-to-day basis, looking at the problems we might have, which are few really.

HM<sub>[084]</sub>: Looking at the industry in general that CUC1 operates in, would you say that there is a threshold for IS/IT investment. There's two ways to look of it. That threshold could be used as a benchmark. In other words you could say to yourselves this is how much the rest of the players are spending as you operate at that level. At the same time it could also act as a cap on expenditure. What are your views on that?

P1: The threshold as to the amount of expenditure we can incur is really based on the structure of our balance sheet. You know, we have capital adequacy requirements and we have certain surplus capital above that. So obviously when we purchase additional computer hardware and software, it is capitalised and it has to be depreciated over 3 years. And the threshold would be that we can't incur an expenditure level that would eliminate the surplus capital which we have at the moment. So the process in CUC1 is that improvements in tech are continually coming along through the credit union industry. The larger credit unions will take them onboard and we will then make a judgement as to whether those new systems are working within the larger credit Unions and those large credit unions are getting value for money and the process for us is will it provide value for CUC1 and do we have sufficient capital to actually fund that expenditure? The limiting factor on ourselves is the impact on capital.

HM<sub>[100]</sub>: That pretty much covers the questions in the first section. We now move on to the second section, which relates mainly to organisational performance. There are not as many questions in this area, but some of them are a bit tricky.

P1: That okay.

HM: First of all, perhaps a basic question. Are there any standard measures of performance that you use or that you rely on within the organisation?

P1: Just talking about the organisation?

HM: Yes.

P1<sub>[106]</sub>: Um, {I think} in the finance industry and also in the larger credit unions there are financial measures. They work on ROA, that's expected within the industry to be {not} more than 1% . Obviously within the finance industry, credit unions the cost to income ratio becomes very important. The banks have got that down to 50% or less and for the credit unions it close to 80%. So those are the key

ones. Also, I mean, because we are a member based organisation just as important are the non financial measures and then we come back to our surveys of customer satisfaction.

HM: Are any of these measures related in any way to your IS/IT investment, for instance when you are making decisions with respect to IS/IT?

P1: To be frank, I mean the financial ones ROA, ROI, CI, we don't explicitly say that "there's \$50k worth of that investment in IT which impacts these ratios". Its more a question of, what is the value for our customers, Will it increase the service to the best benefit of our members, Can we afford it, in terms of the impact on capital?

HM: If I may make a comment on that there. Service is a bit of an intangible and is sometimes very difficult to measure. How do you gauge that? Is it through the surveys that you conduct?

P1: Yeah, I mean we do formal customer surveys, probably every two to three years.

HM: We'll move on then. Just a quick question on the measures. Do you use any of these to benchmark yourselves against other players?

P1: I mean, we compare financial measures with other credit unions and other financial institutions. So you could say that to that extent we benchmark ourselves. But their overriding mission is often very different from ourselves. They come from a position of wanting to maximise financial returns to their shareholders. Our return to our shareholders is often in terms of service, in terms of lower prices for the products we provide.

HM: The next question here relates more to monitoring your past expenditure in IS/IT. Do you have any mechanism for monitoring your expenditures and verifying whether they contribute to performance?

P1: We get down to a very basic level here. I mean, every single invoice that comes through is signed off by P2 and myself. So we are looking at every single individual cost that comes through, including IT expenditure. You know, then obviously we do budget for IT expense {and} on a monthly basis comparing actual to budget. But at a senior level we do get into a deeper level than that, like I am saying by actually looking at every single invoice that comes through and understanding what's behind that invoice.

HM: The next question really relates to cost recovery methods, but you did mention that you do not have cost centres as such {, so we can move on}.

P1: Yes

HM: And would you say that successful IS/IT impacts on the performance of your organisation?

P1: Undoubtedly.

HM<sub>[135]</sub>: And overall, how would you rate the performance of your IS/IT portfolio?  
And by IS/IT portfolio, I mean your entire IS/IT architecture. How would you rate that on a 1 to 5 scale?

P1: In terms of what the architecture has the ability to achieve, it probably achieves that most of the time, I'd give that a 5 out of 5. But because the architecture is old, I mean, if you compare our system with some of the larger financial institutions, our systems can only achieve 50% or less than 50% of what can be achieved from the architecture of the larger financial institutions.

HM: But for your environment they do the job?

P1: For our environment they do the job.

HM: Before I go to the next section, one last question, on which aspect, do you believe, does this architecture we've been discussing have the most impact?

P1: Customer Service

HM: Its interesting that because in most of the literature customer service is emerging {as a key consideration}.

P1: It's certainly what differentiates CUC1.

HM: The next section that we'll look at looks more at the management side of IS/IT. The first question regarding the organisational structure, P2 said he would provide the structure for that. The second question is not relevant to CUC1. The third question is pretty interesting. Do you think that senior management, which is yourselves, the board etc, do you think there is a commitment there for effective and efficient utilisation of IS/IT?

P1: Overwhelmingly so. You know, because I'd say if customer service is what differentiates CUC1 from the large financial institutions and we do want to achieve that, its very important in terms of being able to provide that customer service, so management has to focus on IT.

HM: And given the IS/IT architecture that exists and the organisations use of IS/IT could you rate your organisation's experience with IS/IT? And I am saying look at the organisation as a single entity.

P1: Probably a 2.5 to 3.

HM: If we were to break that down and say managers and non-managerial staff?

P1: Probably 2.5 to 3 for all of them in the same sense. You know, the only people I would give a 5 would be an IT specialist. If you were to compare the IT expertise of the non-IT managers in here and non-IT managers in other organisations, I feel that the non-IT managers here would have more IT expertise than non IT managers in a larger organisation, just because in a larger

organisation they can go running to the IT department, whereas here we have to take care of everything ourselves.

HM: Looking at this level of experience do you think that it forms a good foundation for the effective and efficient utilisation of IS/IT within the organisation?

P1: I do. I would like an IS specialist. It would ideal for any organisation to have this person specialising, but we are not, by our size, where we can actually afford to have such a person, but that would be ideal.

HM: Just to digress a bit and focus on this idea that you have brought up. If you were to look at getting somebody, what characteristics would you look for? Would you look for someone who is technically competent, but of a lower managerial level or would you look for someone who is at a fairly senior level where they would look at strategic issues?

P1: It would be somebody looking at day to day issues. It would be a young person in their mid-twenties, very technically proficient, coming out of uni. They would not be involved in strategic business decision making.

HM: And as far as user satisfaction is concerned with your IT, lets break it down into internal users and customers. How would you rate their various satisfaction levels?

P1: Well probably 4 out of 5 for our customers and if you were to ask the employees, probably a 3 out of 5. You would only get 5 out of 5 if you never have any server problems, and that doesn't happen in the real world.

HM: Question 7, you've already given an answer to in terms of how you measure this, you mentioned customer surveys. Perhaps if I may ask you; is this customer satisfaction a critical determinant when you make IS/IT decisions, I mean do you consider in relation to IS/IT?

P1: Not particularly. Um, when you consider the service, the question is what will be the impact in CUC1 on acquiring IS/IT.

HM: And in terms of the organisation itself, getting back to it, how would you describe the attitude and culture towards IT? Is it a positive attitude or a negative attitude? How is the uptake like?

P1: Um, I think it would be generally positive. Um probably the only negative would be in the sense that, you know, it would be great to do things that the larger organisations are doing, but there is recognition that it is financially not practical.

HM: And lastly, looking at the role that managers play within the organisation, I know it is a small organisation, but do you believe the role that managers play in this organisation can contribute to the productive use of IS/IT?

P1: In a small organisation like this, for sure.

HM: That pretty much covers that section. We are moving fairly quickly. The next section looks more at the considerations for strategic IS/IT planning. We've looked at performance, now are looking at the strategy that links the two together. Okay, does your organisation perform any strategic planning for IS/IT?

P1: No, strategic planning is just purely at the very, very top level. Again in the sense that we are a taker of what is being made available [including to the larger credit unions]. We are not proactive in that sense.

HM: But there is some corporate strategic focus?

P1: There is a corporate strategic focus. But as I said its just at the top level. It doesn't go down to articulating the strategic focus on say IT expenditure.

HM: Um, given, that answer, perhaps then the rest of the questions [in this section] are also answered. We can move on the next section, which related to the organisational context. Four very general questions, and what I am trying to determine is how the organisation fits into its environment with respect to its use of IS/IT. So, what are the major issues in your environment that are of concern to you?

P1: I don't really understand the question.

HM: Okay. Lets look at CUC1 and its operating environment. In terms of the industry as a whole, the banking industry, are there any issues out there that concern you especially with respect to IS/IT?

P1: Not that I can think of at the top of my head that significantly affect our IS/IT.

HM: Is it possible at all that decisions might be made outside of yourselves perhaps by the regulatory authority, that might require significant change to you systems which might impact on the organisation?

P1<sup>[197]</sup>: That depends on the definition of significant. Certainly the regulator, um, \_\_\_\_\_ looking at prudential funds for example, one would be under regulatory scrutiny in terms of loans in arrears thus requiring the core banking system [to be modified?] \_\_\_\_\_ but again the core banking system is not maintained by ourselves, its maintained by CUSCAL. So like I said we are more of a taker of what's provided. Does that make sense?

HM: Yes, it does. It's a bit of a difficult question as I am asking you to look at a range of issues and try to give me a single answer. So I appreciate that. In terms of your environment again, and again that's looking at credit unions, banks and other organisations that participate in the industry, does you IS/IT, allow you to compete [effectively] in that environment?

P1: I'd say that I'd give it a 6 out of 10, where very, very effectively would be a 10 out of 10. So, reasonably effectively. But again its only reasonably effective as

we are part of the credit union movement and belonging to this organisation called CUSCAL using the core banking software CORVIS and it's a number of credit unions together who outsource the running of the hardware to the company TSW. So we can only remain competitive because the movement is reacting to the competitive forces. So if it was left to ourselves, there's no way we could become competitive, without relying on the other credit unions and actually working together.

HM: So you rely on the economies of scale?

P1: That's right, we would not have the economies of scale in an organisation this size and certainly with the credit union as a movement we can generate the economies of scale.

HM: Last question. It's a bit of a hypothetical question. The question really is, do you think that a particular IS/IT decision that would be made internally could have a direct effect on your external environment?

P1: Um, it could.

HM: Do you have any particular examples that you might want to share?

P1: The introduction of Internet banking is one that comes to mind.

\*\*\*\*\*END\*\*\*\*\*



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Interview Transcript – Participant 2

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Participant: P2  
Position: Manger Finance And Administration  
Organisation: CUC1  
Date(s): Friday 31 May 2002  
Location: CUC1 Head Office

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HM: The first question relates to the IS/IT portfolio. I understand from what you described to me earlier that you don't have an IS/IT manager as such. So perhaps we might take a step back here and you could describe to me your IS/IT environment.

P2: Okay, our main banking system is actually run out of Brisbane. So we have what's called an IDPC who process everything for us on this FCS core banking system, which is a system, used by many, many credit unions in Australia. So the IDPC which is "The System Works" its called TSW. So for that they obviously charge us fees for hosting the banking system and for providing the software to run that banking system and that includes not only reports but things like bill paying, our bill paying software and a myriad of other software that we require. At month end etc they run all the reports on a printer in our building here so we come in every morning and the suite of reports are there for us to check off, and things like that. So that's the main banking system that really keeps all our member data. So any member's data is entered into the FCS core banking system. The accounts they open, the accounts they conduct with us are all held in there. Subsidiary to that of course we do have other types of software such as the Microsoft software, the payroll software. So the secondary level is the personal computing software and the various informational bits that are held on individual PCs. Some of which is fairly important such as the payroll, fixed assets etc, but the major part of our business is held on the main banking system controlled out of Brisbane.

HM: Good, thank you for that. Now could we just look at what we call the IS/IT portfolio as a whole, and that takes into account your main banking system your office system, payroll etc. In your mind if you could picture these systems existing in three levels, your infrastructure; which is your telecommunications, your hardware and your office systems etc, your transactions processing systems; which is where your core banking system would be and above that level any Management Information Systems (MIS) that you might use if you have any. In your mind which of these do you think would contribute the most to your organisation in terms of performance?

P2: It has to be the main {pause}, I suppose really the main banking software is really critical to us because that really is the core of our business. Um, so the equipment that we need to run that, the software (which is provided by a company called CORVIS) which we obviously pay a fee for and the processing of those transactions by TSW on that software is really the key to our business. The other software held on the office machines is really secondary and the

monthly accounts that get done from that software. I mean this is a report that comes off the FCS software {shows a printed report}, which does form a part of it. The rest of it is on my personal computer for reporting information to the board. Yeah, the main level is the information from the core banking system, which then allows us to, um, then report on the business. Basically it provides reports on transactions, balances, exceptions etc, its where the General Ledger is held. So it's really key to our operation.

HM<sub>[047]</sub>: Could I ask you to {pause} perhaps if I were to present to you a scale of one to five , such as that {points to protocol}, if I were to ask you to rate the three levels, what rating would you give to the first level, the general infrastructure?

P2: It would have to be five (5), being extremely important.

HM: That's the general infrastructure, the base level? Remember the three levels, we have the infrastructure level, the transactional level and the strategic level.

P2: All right, okay. Well they are all important. The general infrastructure, that includes the office machinery, well that would probably be less important than the other two. Ah, but again more important from the point of view that, that's more important from a reporting point of view to management and the board whereas the infrastructure is important in making sure that the members are being serviced. So they would be seen as very important and critical whereas the other would be pretty important, but not to the same level, probably not critical.

HM: And your architecture as it exists now, do you think that it meets the needs of the organisation?

P2: Generally it does, yes generally it does. We are probably a reactive organisation, than a proactive organisation and the architecture, um, we {pause}, we have to have the architecture in place to service our members and to be able to report to management and the board. Therefore we tend to try and keep up with the latest technology both hardware and software. Um we are just upgrading the communications network between our branches from a modem type system to the CISCO routers type system that is more efficient. We are spending about \$50,000 or \$60,000 in doing that, just to keep us, I suppose, up to date. We are one of the last credit unions to do that, but we are one of the smallest as well. So generally, yes, generally I'd say we may not be the cutting edge sort of thing, but in some respects we have to be particularly if something new comes on stream um and we have to gauge from a competitive point of view, do we have to spend that money to remain competitive within the credit union finance industry. So um that's probably how we operate, being I suppose reactive to what many other bigger organisations are doing. And we are never ever the first to move onto new software. We prefer some of the larger institutions to try it first because we know they have IT departments that will test the software and things like that so we rely on them to iron out the bugs before we make a move.

HM: And which areas in your mind do you think require the most improvement in your current infrastructure?

P2: Oh, um well the current banking system has got some shortcomings, but I mean its very difficult because we just can't, as an organisation, look at an in-house system to look after our members. So we have to go with a system that is provided by the TSW for a large number of credit unions and we just pay for a fee for that and its something that we can afford. So we got to put up with it's shortcomings though, it's a pretty good system. As far the office machinery goes yeah we probably could all use a bigger, faster and more powerful machine, but obviously you try to buy a machine that will last at least three years, we depreciate over three years and hopefully beyond. We've got a program where we've got about 20 odd PCs for instance and on that basis we know that we have to replace six or seven every year. The odd thing comes along from time to time, which we've not sort of catered for, but then we just have to build that in. Generally they would not be huge expensive items, a printer suddenly goes down and we have to buy a new one sort of thing.

HM<sub>[090]</sub>: We move on now to perhaps the more budget type related questions. My first question to you in this regard; can you outline your budget process? In other words who is responsible for it, um how do you go about it, who initiates IS/IT requests etc?

P2: Okay, myself and P1 are the ones who put the budget together, but of course before we do that we do ask the individual managers and I'm talking about the Lending Manager, the Operations Manager and our Marketing Co-ordinator to provide input into our budget, both on expenditure and capital to look at their areas to see if there are any requirements that they may have for the coming year. But any major decisions, really Mike and myself have got to sit down and say what are our requirements for the coming year taking into consideration anything that any of those three other may have said both from an operating expenditure and capital expenditure point of view. Um then when the time comes for us to make purchases, spend money, and then obviously, hopefully it has been covered already in the budget. The requests come again come from either the managers if it is in their areas "we'd like a couple of PCs, can we have them" sort of thing then we'd say yes. Um but for instance the latest upgrade to the branch telecommunications well that was something that Mike and I really discussed. We were having a few problems with a couple of branches where communications were very slow, were dropping out, sort of thing, and we were having a bit of pressure from the IDPC to for us to move towards the new communications similar to the other societies. So all that combined, we decided to start doing that, which we then commenced last month. So being a very small organisation its very {pause}, its done and the very top level, reasonably informal I guess, rather than a formal sort of paper and bureaucratic process.

HM: Surely you must find there are some advantages to that?

P2: Absolutely. We can react very quickly. If something is required and particularly if it is required urgently, the decision is made very quickly, very easily because it's made by P1 and I. Obviously some of the larger expenditure would have to go to the board, but again if its already in the budget they will have approved

the budget at the beginning of the year. So again that's not a major problem. But if something comes up that was not envisaged, which happens from time to time, then we do have to go to the board for special approval. That may even be only a few phone calls initially to some of the board members to say "listen this is urgent, we can't wait for the next board meeting, are you guys okay to approve this and we will formalise this at the next board meeting" sort of thing. So it works very well, its very informal. And I am sure that's probably the way most small organisations operate.

HM: And given the situation that you have, are there any limitations that stick out in your mind in terms of perhaps affecting your decision making process?

P2: Um, no, not really. Again often it's reactive, and these are decisions that have to be made so in a way sometimes the decisions are made for you. And there are usually valid reasons for making those decisions in respect of IT. It's either to remain competitive with major competitors, or its to improve the way we provide services to our members and information to the board. So there's a genuine reason, um {pause}, but um {pause}, you know that makes us move in that direction.

HM: Okay, thank you. {Pause} Um next question has got to do with some of the costs that you might have.

P2: I suppose, I took out some figures, these are really just for the ten months of this year so far, as to where we are spending some money. Now I suppose I saw our main areas of costing as really the hardware and software, so it is really a capital equipment sort of thing and as you can see we've only spent so far this year just under \$36,000. Some of that is software and some of that is hardware. On the expense side, all the costs associated with the IDPC and the fees we pay to them, hardware maintenance, depreciation on computer equipment and then our software maintenance as well. So they are simply what I saw as the main areas. I didn't include (you may disagree with this) the actual transaction processing costs and they come from a myriad of organisations, your know, VISA, Giro-Post (Australia Post) etc. I don't know whether I should be including those as IT or whether that's more of an operational type cost.

HM: It's actually a very interesting problem and that's one of the things that I am trying to find out in my research ie whether those costs, that are usually lumped as IT costs are actually IT costs.

P2: We in our internal reporting actually do show that {points to spreadsheet}, thats the two costs there and they are quite large, they are quite considerable, but in some of the reporting to the likes of APRA, they see them as 'other operating' costs instead of IT costs. So that's why I've sort of, although we show them as IT costs, in other reports to external sources we don't. Its an interesting one and also of course some of these costs are actually recouped and offset in income. Sometimes, you know, you may get charged \$1.50, by say VISA and you may on charge all or part to your members. So there might be a corresponding income to offset that cost.

HM<sub>[146]</sub>: That's a particularly interesting point there. Um, do I understand you correctly in what you are saying that there is almost a direct correlation between the costs that you incur for transaction processing and the charges that perhaps you might levy for the services that you provide?

P2: Not entirely. Because you've got, um {pause}, some transaction costs we don't recoup, some we recoup in full, some we recoup partially. But then you've got situations like where we will say, we allow our customers ten free transactions a month. Of course for these ten, some may not cost us anything, I mean eight of them might be someone coming into (well when I say directly, without costing us anything) coming into a branch and making a withdrawal. Now that in effect we do not have any one charging us for that, so it is just a time factor, an admin factor. But if they go to an ATM, we could be charged, say \$1.50 by Bankwest, say. Um, of course if it is part of their ten free transactions we are not recouping any of that. So we certainly don't recoup nearly all, a fair bit of that is not recouped.

HM: But it is safe to assume that the costs that you incur do translate to some form of income at the end of the day.

P2: Some, yeah that's right yes. There are some costs that we recoup, for instance there are some costs that we recoup, the BAD tax for instance. We recoup that, um {pause}, the bulk of that apart from what we get charges ourselves as a customer of the banks. So we do. We are actually looking at our fees at the moment because interest rates for the last six months have been fairly low and therefore our interest margins have been very, very tight. Its made us sit down and look at things like our expenditures, our costs including those costs where we can levy a fee and looking at the appropriateness of the fee. So that really is the situation there with I suppose transaction costs, {pause} so there is recoupment.

HM: Could I ask therefore if I could have a copy of that? These ones for the time being I think it might be safe to say that I can request for them later? I am sure that there is some sensitive information in there that you might want to look at in a bit more detail before releasing that information to me.

P2: Yes, most certainly. That's fine.

HM: You probably find that when you look at this one here {data schema} you've actually started answering and it will probably be somewhere there {spreadsheet in front of P2}. The important thing about this is the fact that this is for five years. This is for the current year and that too is fine. In doing this one {data schema} you don't have to provide me with specifics, such as these {spreadsheet in front of P2} ratios would be fine.

Alright, question four I will leave out until you've had a look at the schema. And question five am sure you can answer (you've already answered it partially) do you believe that your organisations investment/expenditure in IS/IT contributes to overall performance?

P2: Most certainly!

HM: Is this contribution positive or negative?

P2: I think its very positive. At the moment our investment/expenditure in IS/IT is something that we have to have to operate. If we didn't, if we weren't investing and spending money in that area we would not be able to operate as a credit union. Its as simple as that!

HM: Excellent. Moving on. In terms of your, {pause} going back to the IS/IT portfolio, in its current form, are you required to demonstrate benefit to the organisation. In this case I'd like you to think about in terms of, is it for only new systems, for existing systems or is it for future systems.

P2: For old and existing systems? Well I suppose the main answer to that would be, no, we don't. I suppose the evaluation would be, if the money that we spent has provided what we had hoped for. For instance, the money that we are spending at the moment on the branch communications- will that overcome the current problems that we having with the slowness of the system and once we've got the new communications system in place, will those problems have evaporated? That will probably be the evaluation and on that evaluation we will say that- yes that money was well spent, it has overcome the problems that we are experiencing before.

HM: So you look at it more from a benefits realisation point of view, rather than from an expenditure point of view?

P2: Yes, we obviously know what's required to improve the situation that we've got, either a new PC or new communications. Therefore we know basically what its going to cost us. Um, there's usually very little variance in one PC to the other. Therefore the main criteria is that- is it now providing the benefits that were envisaged? If there was a problem, has it overcome that? And is it working as we expected? That would be the criteria that we would be looking at.

HM<sup>[189]</sup>: I suppose given your answer to this question it sort of means when we look at the next component where we are talking of things like NPV, and payback periods, I would assume that given your previous answer you don't really go into these things unless it is something major?

P2: That's right, yeah. And really since I have been here, in the two years, I suppose the two major IT {projects} particularly of a capital nature would be the branch communications system that we are currently in the process of upgrading that is going to cost us about \$50,000 or \$60,000. The only other expenditure really was a new server which we actually bought a second hand, which although it was a \$30,000 machine it only cost us \$11,000. So we haven't had major expense, when we compare with other lager banks. A lot of that is due to the fact that we are covering that by the fees we are paying to the IDPC, because they are really running our core system.

HM: In terms of the IDPC, if they are running your main system and they have to perhaps perform an upgrade to the system, are you required as a member organisation to contribute to the cost or do they simply go ahead with the upgrade and then charge that out?

P2: No, we get advised of any major upgrade. There's probably only two or three major upgrades in a year. There may or may not be a cost involved in that, but we don't always have to take the upgrade (you're probably silly not too). We always have the latest version of the software, some of the other societies don't, but we always do. Often there isn't a direct cost. Where they reflect is probably when you renew your 12 month fee, it will probably be built into it so that you see the fee ongoing up by 10% or something which will cover it. If they are adding a new software product to the main software- for instance you buy a new B-pay software or something like that then there will often be included in here {points to document}, there will be some reasonably direct software purchases for us to maintain. I can actually break that down between physical hardware and software, that \$36,000 there. So we do capitalise those direct purchases, fairly large expenses in software. Again the reason for that is we feel, {pause} not that we buy all software they bring out because some of it is not relevant to us, but we have to spend that money to remain competitive to offer a service that is being offered by all the other credit unions basically.

HM: In terms of, just getting back again to the second portion of that question. In terms those methods listed there which one would you say you would use if you had to?

P2<sub>[210]</sub>: {Laughs} I have actually just put down 'other'. Its really based on the business need really actual business need is the criteria that we use.

HM: excellent, and from your experience, how long does it take, once you've spent some money on the particular upgrade or some particular systems how long would you say it takes before you start gaining some benefit or seeing the benefit of this?

P2: Sometimes it's immediately. With the branch communications systems the problems that were being experienced by one of our branches were overcome the moment they switched over. So I'd say often the experience is that generally you start experiencing benefits straight away. You buy a new computer for someone, so its got more memory, it's a bigger machine, immediately they can see things happening quicker and things like that. So often the benefits of spending money in IT is instantaneous.

HM: Given that, how would you judge the success of IS/IT in your organisation? Lets say for instance you went through a project, let's take this particular example of the data communications upgrade that you are looking at. Its obviously going to take a bit of a while to get through it. At which point after the completion of the project would you say that you have achieved your objectives?

P2: Alright if we look at the whole project, in which we are looking at head office and the four branches, we are down the track with head office and one branch

being done. The others will probably be done in the next couple of months. What has been done so far is that the head office and the one branch, we are seeing an immediate positive impact. We assume, I am sure we will get the same impact when we roll out the other three branches. So in effect we are seeing an immediate effect from which our main benefit is we are able to better serve our members. Our members do not have to wait while the computer slowly churns through processing their transactions. Things are happening a lot quicker at the branch that we've done and we've got happier members and we are a much more efficient organisation. But obviously at a cost, though we believe it's a cost that we had to make.

HM: This is a bit of a difficult question here. And I think you may have touched on it earlier when you discussed the concept of your organisation being a reactive organisation.

P2: Reactive and fairly informal.

HM: Um, lets look at that question. Do you think that your industry and bearing in mind the sector of the banking industry which you are in, do you think there is a minimum threshold that is required of say IT spend in order to remain competitive and would you be able to ascribe a ratio to it, say 15%, 20%, 30% etc?

P2: I think there is a minimum threshold. Because you do have to um {pause}, let me say in the current finance environment, you do have to keep up to date with the latest software, some of it obviously imperative if you are to remain competitive. And obviously to run that software you need the latest hardware, because well hardware has a limited life time so you are always having to upgrade your computers and printers and things like that. Um quantifying it could be a little harder. I am sure if we were to look at what we spent over the last five years its probably a little bit \_\_\_\_, of those years for some reason we've had to spend more in some years than perhaps in previous years simply because there's been either, um {pause}, software expenditure that we've had to make, or the new communications system for the branches which is quite a large expenditure for us to have to make over a number of months. Um, I am not sure at this stage, without looking at some of the figures, whether I can quantify it establish the threshold.

HM: Perhaps we might be able to do it when we get more of these figures {data schema}?

P2: Yeah.

HM: From a personal perspective do you think that such a threshold, if it exists, could act both as an enabler and a limitation? An enabler in the sense that it can enable you to benchmark yourselves against other operators and a limitation in the sense that you might say fix yourselves and say– we will not spend over '\$x'.



P2: I can see it doing both actually. If you did come up with a figure of 10% or whatever, um {pause} and you, um {pause} I think you can only use it as a benchmark knowing that it is not fixed. Some years you may get away with being below that benchmark and may be even well below. But others you might be well over it. I think its important with any benchmark that that's all it is. Its not something that is fixed that you have to maintain. If its not maintained there must be very valid reasons for not maintaining it. It's a bit like 'actual vs. budget' in a way isn't it? Variances to budget are okay as long as you clearly can explain the reasons why you've got those and they have to be valid reasons.

HM: Lastly in this section on the IS/IT portfolio, what I would really like to have is this information here {data schema}. Once we have that information on the various components then we can sort the rest over e-mail.

P2: Okay, that's fine.

HM: So we'll leave that for the time being. We move on to the next section, which is really looking at organisational performance. And again what we are trying to do here is look at the IS/IT and say is it in anyway contributing to performance. The first question there I suppose is a pretty general question. Are there any standard measures of organisational performance that are used?

P2: Oh yeah. We probably similar to most organisations you know. We are looking the various ratios, Return on Equity, Cost to Income Ratio. Interest margin is a key one for us because that's really where we make a profit, that's the main contributor to our profit, so that's a key {pause}, I suppose a key for us is the interest margin.

HM: Do any of these, {pause}, are any of these directly affected in your mind by your IS/IT expenditure?

P2: Um, I suppose indirectly they are. Because I mean, {pause} I suppose we'd see the need to have the latest IT software and IT hardware as being necessary to be able to operate as a viable financial organisation. Therefore if we were lacking in that, there will be a negative effect on staff morale for instance, staff do like equipment and software that works and works well. Therefore if that was the case then I am sure that some of those ratios we use to measure how we are performing would be negatively affected from that point of view. Just keeping in mind that largely we believe that what we are spending on IT is only what we need to spend, its not that we are going out and unnecessarily buying something with all the bells and whistles on it. Its really mainly to make sure that we are able to service our members and make sure that we've got the software that we need to remain competitive and service those members properly.

HM: Um looking at it from another perspective, do you think that any of those indicators that you mentioned could be linked to the IS/IT portfolio, the expenditure itself?

P2: Well, I wouldn't say directly although there is a link there because IS/IT expenditure is an important facet of our operating expenditure, something that we have to do to remain competitive to remain, capable of servicing our customers at a level they will remain with us and not go next door to someone else, because they can get a better service there because- because they spent a lot more money on IT. So I suppose from that point of view that kind of indirect rather than direct linkage would have an effect and hopefully because we are doing it properly it has a positive effect because we are I believe spending only what we have to spend but at the same time we are keeping up to the latest hardware and also the latest software that we require to run our business.

HM: And would you say that these performance indicators are critical to your decision making with respect to IS/IT?

P2: No, I'd say they are probably not critical. I'd say the most critical, I suppose, things on our mind are - why do we need to make that investment? – is it because what we've got is not working properly? – is it new software that we have to but because all the other credit unions have probably something more competitive to offer to the same service to our members? So I'd say that's the initial mindset that we use not the fact that this will give us a better Cost to Income ratio. I think that is probably more a result rather than a key consideration when we are looking at spending IT monies.

HM: And from your perspective as perhaps the chief accountant, do you have any measures for monitoring your IS/IT expenditure? I notice that you've got those items there {spreadsheet}?

P2: Only obviously to the point of the usual 'actual vs. budget' type situation which we've got in our accounts. We actually budget what we are going to spend and hopefully that keeps in line with what we actually spend, but if not hopefully we've got a valid reason for doing it. I mean its also, {pause}, I've written down here that the external measures are things like customer complaints, you know- the telephone banking system is not working or slow service in the branches because the system is down. And we do, from time to time, do go out and survey our customers over various things including things that are impacted by our IT, so we get feedback hopefully positive but also negative which sometimes make us make new, force us to make IT decision to provide the IT expenditure.

HM: Just going back to the IDPC, and core banking system. What is the main cost allocation system that the use there? You mentioned transaction costs, is that the main method?

P2: No, the main criterion used is the number of ports that we've got. So basically the number of machines that we have got linked to the main computer system. So for instance each of our branches has a couple of machines that are linked to the IDPC. So there is a cost per port and there is a cost on the number of transactions that are processed during the month.

HM: What about reports?

P2: Well we don't actually get a physical charge on that, but we do also get for some of the software we are using. For instance we've got archiving software for instance. We archive on an regular basis and they got an archiving system that we can go into and retrieve transactions, retrieve reports, customer statements, you know – if a customer lost a statement of five years ago you can go in and reprint it. But there is a cost to us to do that and of course we will then on-charge some of those costs to our members, if they want a statement going back sort of thing.

HM: So overall, how would you rate the performance of your IS/IT portfolio, if we were to use that 1 to 5 scale?

P2: Probably a four (4), which would be generally satisfactory.

HM: And lastly, on which aspect of your organisation do you think IS/IT has the most impact?

P2: Well, I believe it's on our services to members. That is the criterion for spending money, I believe, on IS/IT is to provide our members with efficient service that is equal to, or hopefully better than some of our competitors.

HM: Okay, I think we've covered the first two sections fairly quickly. The next section looks more at the internal management issues. Would it be possible for you to provide me with an organisational structure chart for CUC1?

P2: Yes, I can do that. It's fairly simple.

HM: And obviously when we get that we can have a quick discussion on item #2 which relates to how your IS/IT function managed. Now you did mention that you don't have an IS/IT department.

P2: No we don't, but I can briefly explain. A lot of it is probably done at my level or P1's. We do have a person whose, I suppose, one of his functions has been to become the IT person, but he does have other duties as well and sometimes is over at a branch like that so it is a bit ad hoc. We do use external people for a lot of our IT specialist type of work to, um {pause}...

HM: Repair PCs?

P2: Absolutely, yeah if we are having problems some of the things we fix ourselves, some we just have to get someone in to do it because we don't have an IT department or specialist in the organisation.

HM: And do you find that method of 'on-call' service preferable?

P2: No, its probably on of the biggest downsides, really because they are often busy elsewhere. So it might be we've got a problem in the morning that might not get resolved until the afternoon. So no, its not the ideal situation. The ideal

situation would be simply to spend the money to employ someone who would be able to resolve the problem fairly quickly. So that's the downside to being a small organisation probably not having the resources to employ a specialist person on a full time basis.

HM: Okay now, question 3 relating to senior management in this organisation. Here I'd like you to think of, not only perhaps people at your level and P1, but also perhaps your board as that could be classified as senior management. Do you think that group has a commitment to the development of an efficient and effective IS/IT?

P2<sub>[312]</sub>: Yes and no. I'd say yes, when we go to the board with recommendations they will always be accepted without question. But I am not sure that they in their own minds are actively thinking about the IT situation at CUC1. As the board of directors, they are relying on senior management to make sure that we are making the right decisions. If it's a fairly large expenditure decision then obviously they are consulted and asked for approval. So yeah from that point of view they are committed to the point of view that they will support management. But no, they are not proactively thinking about coming to us and saying- 'we think you should do this and do that'.

HM: That's interesting. Okay the next question is more of a {pause}, what I'd like you to think about is the organisation as a whole. What I am asking there is how would you rate the level of experience, with IS/IT, of CUC1 as a whole?

P2: I've actually written down three (3) here because obviously we do not have an IT specialist. We've got good people who basic knowledge and can actually fix up problems to a certain level, but because we lack that IT specialist, its more of a basic IT knowledge, you know, you're dealing with computers all the time and therefore you do build up some sort of level of expertise but its not what you would really call a high level.

HM<sub>[322]</sub>: If we were to split between management in the organisation and general staff, how would you rate the various levels there?

P2: Again, there's probably going to be swings and roundabouts. Some of the staff would possibly be a bit higher than some of the management. Generally, there's probably two or three of us who would have a higher level than say most of the other staff. Probably myself, Richard (whose the IT person) whose been here quite a long time, his is a lot of knowledge built up over a number of years and probably the one other who would have the strongest IT knowledge and then it starts dwindling as you go down.

HM: And looking at the overall experience of the organisation, do you believe that forms a good foundation for the use of IS/IT?

P2: No I think that's an area where we are lacking and that is due to the fact that we do not have specialist IT people within the organisation and we do have to rely on external parties. Partly overcome by the fact that our main banking system is really outsourced and looked after so that's a plus for us and they have the

expertise in Brisbane who look after it, and it's a system that runs very, very well so in a way that negates the need to really have a strong IT function within the organisation. But it certainly does provide shortcomings in us not having that when problems arise and the fact that we've got to go and get people in to resolve problems which as I said often can't be done immediately you've got to wait for their availability.

HM: Again, going through and looking at your users and for users I'd like you to think of both customers and employees as users. How would you rate the two groups' satisfaction with your existing IS/IT?

P2: I'd say probably in three (3) to four (4) mark, because with external users sometimes you have a problem with Internet banking or B-pay, or things like that. Some would say five (5) but that would be because maybe their use is not as great as some other members {so they may experience less problems with it}. And the staff would be saying it's not as bad, sometimes it could be better and often the reason for that is things like this morning when it's probably a Telstra problem, but for all intents and purposes for a lot of our members and staff they say the system is not working and that has a bearing on how they see the efficiency of the system and the rating they would give to it. So I would be saying from a satisfaction level, probably for both employees and customers would be in the 3 – 4 mark. Hopefully, particularly with the new communications system that will certainly improve things for our members and staff.

HM: And do you have any formal mechanism for monitoring these satisfaction levels?

P2: Well we do as I mentioned before have a complaints register that may or may not cover complaints with respect to our IS/IT situation. We do survey our customers from time to time to get feedback. So they would be the only formal methods that we have to measure these levels of satisfaction. The IDPC do at the end of each month send us a schedule of their uptime and downtime so we can see if they were having any problems which probably has an impact not only on our satisfaction but also flows onto our members and staff as well. Um, yes so those would really be the only ones, then you've got the informal ones such as the complaints over the telephone and feedback from customers.

HM: And perhaps a difficult question, how would you describe CUC1 as an organisation and its culture towards IS/IT?

P2: I suppose, reactive probably rather than proactive and wanting to be up to date without being the leader. Our culture is as an organisation, which probably relates to the IT area is providing an efficient service to our members and therefore we want the IT systems to facilitate that. We don't necessarily want the bells and whistles, we don't have ATMs for instance but we believe that when our customers come to see us that we provide a personal and efficient service. So we really want to make sure that we have the IT platform to enable us to do that and you have to have that, it's a key element these days in providing such a service to members particularly in a small financial institution.

HM: And as far as the adoption of IS/IT itself is concerned, do you see that as being problematic at all in your organisation, e.g. the users' attitude towards technology?

P2: No, no I don't. If anything our users/members are probably the ones who are driving us to become more and more towards internet banking, telephone banking, B-pay etc, rather than the other way round, and our figures are actually showing that there's less and less people actually coming into our branches, but there's been an explosion in the levels of internet and telephone banking etc. and we provide these services because we know our competitors so and we have to and it's obvious that's what the members are wanting and therefore we have to make sure we have the technology to put the systems in place to do it efficiently, properly.

HM<sup>[356]</sup>: And lastly do you think the role of managers in this regard actually can affect the utilisation of IS/IT?

P2: Oh yes. I think that you've got to have managers who are in the mindset that that's the way we've got to do it- we've got to spend money to be up to date- therefore we've got to spend money on IT. Um and they know the reasons why, servicing our, it's what our members are now asking for, demanding probably not asking for {laugh}. I think we all are {pause}, I think most people who do work in the financial industry have always had to have that mindset. It's been such a changing environment over the years and a lot of that's been driven by, you know, the IT, I suppose, explosion - the major changes in IT over the last five or ten years in particular - that we've all become used to it and I think we are all very pro-IT. Um and it's quite exciting at times as well as daunting.

HM: I am sure it is. I think what we'll do {pause}, because I am mindful of the fact that you have an 11 o'clock appointment, may I suggest that we stop at this point?

P2: Yes, so we've done sort of the first three sections would that be right?

HM: Yes, we've got a couple more sections to do. That should take us just half an hour and we can arrange a time that is convenient for you. I'll probably send you an e-mail, say Friday and you can give me a time for next week?

P2: Yeah, that should be fine.

HM: Thank you very much.

{End of Interview, Part 1}

HM: Okay, the last place we finished off at was section 3. So we'll start at section 4 today. Basically the questions here relate to strategic planning especially with respect to IS/IT. I am sure CUC1 has a corporate strategic plan, so would you mind talking about that a little bit.

P2: yep, let me tell you. We recently met with the board to discuss, I suppose, the strategic way forward for CUC1. Its probably a macro type of strategic plan rather than a micro type. Its driven by a number of things such as the requirements of APRA and generally where our philosophy of personal service to members with as little fees as possible with as competitive interest as possible. Um so its more along those lines, um you know, for instance one of the strategies is to make sure we have a presence in the four campuses of major universities.

HM: In WA?

P2: In Perth, actually, no in Perth. They don't even want us to say move to the, I think it's the Curtin Campus at Bunbury...?

HM: Edith Cowan...

P2: Edith Cowan, sorry, in Bunbury. We've no intention at this stage anyway as part of our forward strategy of moving down there. So its really to maintain our presence in the four major campuses in Perth. Now that will entail transferring or probably closing the Edith Cowan Churchlands branch and moving to Joondalup because we now see Joondalup as being the main one. Although we have actually tried to get into the Mount Lawley campus because it is a large campus as well but that didn't work because they couldn't give us a satisfactory venue, but we would still be interested in moving there if the opportunity arose. But certainly maintaining our presence at UWA, Curtin and Murdoch is very important but not moving anywhere else. Other strategies discussed were the investment of our excess funds, um, we do have extremely high liquidity, um but the strategy of the board directive at the moment is that those excess funds must be invested in high quality assets with either the four major banks, or CUSCAL, which is the credit unions control body. We have to maintain a certain amount with CUSCAL any way, about \$6 to \$7 million, then anything else can be invested with the four major banks. The only thing, that we really invest in are the bank bills. So that gives us a little bit more scope to maybe look at more of those highly secure investments, perhaps even look at some government type investments maybe long term particularly with the high liquidity as we will not nee to draw on that certainly not in the short term, therefore we can go out longer at a better rate. It's a catch 22 now with interest rates rising you do not want to go out to long {laugh}. So we still have that. So that's the sort of thing that has been discussed. A lot of the strategic requirements are actually placed on us by the governing bodies such as APRA and ASIC and things like that and have an influence on the future strategy of the society. Certainly the issue of expenditure on IS/IT wasn't discussed apart from the fact that the, I previously mentioned that our main banking system is the CORVIS FC system which is an okay system um, but it has been contemplated and if we were required and it almost happened three or four years before I came here that we move to another platform that could be quite costly, you know we could be up for maybe a few hundred thousand dollars in moving that. So that's something that we've thought about as a possibility but we've not actually built anything into any budgeting at this stage anyway and

even beyond one year its something that at this stage we as possible but not probable.

HM<sup>[048]</sup>: In terms of this, um your maintaining your presence in the four major universities, is there any intended expansion in terms of perhaps upgrades to your architecture. Do you see the potential changes in the near future necessitating that?

P2: Well we are in the process of upgrading our branch network from a modem system to a router system, ADSL, which will make the communications much more efficient, quicker less prone to down time. So we are in fact, {pause}, we've done the first branch which was Murdoch and we'll now roll out to the other three. The only question being whether we bother rolling out ECU Churchlands or whether we wait until we actually move to the office in Joondalup, that will hopefully be {pause} the intention will be probably to move up there in the Christmas break and re-open again a few weeks later. It will probably be in that time that we'll make the up to Joondalup. So yes, we are aware that we need to have reasonably, keep reasonably up to date with the latest technology. You know, downstairs, I don't know if you noticed but, we now have the nice flat screens instead of the old 'green' machines which were probably over ten years old until a couple of months ago, dreadful looking things. Um so downstairs and at Murdoch now we've got the new flat screens which look a little bit more presentable and I think the staff like them a bit better as well as the better communications systems which does make the system a lot faster we well. We just recently also installed photocopier/faxes at our branches. There was a problem before. They didn't have photocopiers before, they only had faxes so that when people came in say with their identification for instance, being a passport, they couldn't actually photocopy it, so they had to actually ask the member to go away and get a photocopy whereas now they do have a photocopying facility. So yeah we realise that our branches are our facilities and they need to be staffed properly with the right IT equipment. Two of our branches are currently one person ECU Churchlands and the one at Curtin. And we will be looking at that. One person can keep the business rolling over but hasn't got the ability to go out and build the business. So we are actually going to be looking at whether or not we upgrade that branch to either one and half people, you know one full time and one part time, or even two full time to give them the scope to then go out and talk to the people within the university, make presentations about CUC1 and what we offer them and see if we can actually build business because we do realise that we don't fully capitalise on market within the university. A lot of the university staff and students do bank elsewhere. Um so we do have an opportunity we feel particularly in there and some and same applies for ECU Churchlands where there's only one person, so when we move to Joondalup it might be an opportunity also to increase the staffing levels there to make a concerted effort to try and sell CUC1. But that's outside the IT, I'd say though it would be impacted.

HM: Well um its interesting to hear what your plans are and where IT could possible help. Any thoughts of upgrading from a one person agency situation to a branch will still require investment in IT.



P2: It will. It will require additional terminals and all that, so most certainly. So there will certainly be a cost involved both in staffing and IT.

HM: Much of the questions in this section relate to strategic planning and given the size of your organisation do you actually involve all departments in the process, for IS/IT not for the corporate one?

P2: No we actually don't. Unless its part of the corporate one and it is , its probably at a fairly macro level without getting down into any great detail. It would simply be something like- we want to expand the branches and therefore there's going to be an impact on IT and we need to be aware of what we are going to require, how much is it going to cost, and perhaps what the payback is going to be.

HM: Um we move on then to the last section, since most of these questions do not apply, which is the context of the organisation. And here we're really talking about your macro environment and how CUC1 perhaps fits into that environment. Um just briefly, you mentioned APRA and ASIC as two of the prudential regulators. Could you just describe that environment and how that impacts on CUC1?

P2: Okay we are certainly no different from other financial institutions. Our reporting requirements are exactly the same as say the commonwealth bank. You know we've got to produce the same reports to APRA on a monthly, quarterly and annual basis and the same returns to ASIC etc, although we are only a fraction of the {pause}, you know, our assets would be akin to their petty cash {laughs} or something like that. So we've got these requirements, we get audited on a regular basis by APRA, though I've not seen any ASIC people come in. Certainly APRA, we've got a close working relationship with APRA. We had a full audit last year and they come in from time to time and will just target specific areas, for instance they may just look at commercial lending for instance which is an areas they are very keen to keep an eye one, bad and doubtful debts for instance and things like that. We're reasonably lucky in that one of the chief APRA people in Perth, both P1 and I used to work with her, in fact I used to be her boss many years ago. And then one of the other guys who is also fairly senior used to work closely with our lending manager. So we've got a good working relationship with them. Nevertheless they sometimes do give us a hard time if they feel that we are not sort of doing quite the right thing. But yeah, every month I've got certain returns that have to be sent in and they get sent actually over east, but they do get reviewed by the local people and if there is any query on any of that it's the local office that will ring me and will query anything on those returns. There's quite a large suite of returns which have to be done on a quarterly basis. Again as well we do them and they are sent through the internet to the APRA office in Sydney.

HM<sub>[106]</sub>: just two questions on that. Firstly the returns that you do, are they returns you can easily pull off your existing system or is there manual intervention where you get raw data export it to Excel and then manipulate it in Excel?

P2: Yes some of it is fairly straight forward, it will slot into the APRA return Others you do have to do a little manipulation. We try to improve on that because unfortunately the current suite of returns has only been in for this year. So we had other returns that we used to do, then they totally changed it. The reason they've changed is that they now made so every financial institution does exactly the same returns. Previously there would be some returns for building societies others for credit unions others for small banks and others for big banks. Then it was decided that- you are all financial institutions, you should all be doing the same type of returns. So the return that I do is exactly the same as the commonwealth bank. So we're having to gradually improve on the way we get the data there, so were possible we want to just slot into the, I think, 30 odd returns that we have to do. Once we got past the first couple of quarters we've got it down pretty well pat. It doesn't take an enormous amount of time. I mean I can sit down for a couple of days, if I get a couple of fairly solid days I can knock them over.

HM: And given your current set-up with CUSCAL and your core banking system, do you think that there are areas of potential growth and does that environment lend itself to facilitating that growth?

P2: It certainly lends itself to facilitate the growth that we perceive at CUC1. Ah, we're not an organisation that will try and double our growth in the next twelve months or two years. We've always been an organisation that likes slow but steady growth may be three (3) or four (4) percent a year. And that's how we've tended to gradually grow the business. We feel certainly that there is some scope to maybe grow it quicker because we don't believe that we take full advantage of our market that is university staff and students. You know throughout the almost 40 years that CUC1 has been going, it has experienced good solid growth over that time to over \$80 million odd in assets, sort of thing. We had a pretty reasonable year building the loan book maintaining the savings/investment portfolio at a good level. Clearly tight conditions profit wise, um {pause}, its been approved by the Reserve Bank this morning to increase interest rates. Which is good news for us for two reason, including an increase in the interest margin. In the tight times, as most organisations do we tighten our belts and look at our costs and things like that and we do benefit from that in the future as well. So things are looking pretty positive for CUC1 because unlike most financial institutions I don't think we have the same pressures as they have. We are in a nice niche market that we seem to service very, very well. We've certainly benefited over the last four or five years with all the bank bashing and people getting very disillusioned with the banks service or lack of service, that they've got high fees etc. So there's the upside. The downside for us is we are small, we haven't got a huge branch network but the growth in telephone banking, Internet banking etc, POS and ATMs has been very much in our favour because people now don't necessarily want to go to a bank branch but they do like to speak to someone local and not necessarily get through to someone in Brisbane, Sydney or Melbourne when they want to ask a query on their account. So they appreciate that, from that point of view.

Yes slow but steady growth hopefully that will continue which means that then flows through to the IT. What we will do there is we will just make sure that

{pause} with the core banking system we always make sure that when a new release comes out we will move towards that new release with the proviso that we are not the 'first cab off the rank) because we know that the larger societies do a lot more testing, you know they do a lot more testing, they got the full time IT staff there and once we know that at least one of those societies has upgraded to the new software, then we are happy to do so because we know it would have been pretty well tested.

HM: And in your own niche market, which is the university community, are you experiencing any competition from other credit unions?

P2: No, we've not really. In fact its probably gone the other way. Um most of the campuses have got other banks but no credit unions. Ah, lets take UWA for instance. They had the Commonwealth and Challenge-Westpac. CWB actually closed their branch there last year, they do have a branch on Stirling highway. And Challenge have actually cut back their hours, so they are closed for an hour at lunch time for instance and I think they now only operate with two staff in there so that's been a benefit now because we've maintained our presence. In fact just before CWB closed, we actually changed offices and got into a much better position at UWA because we used to be stuck around the corner and now we are in the main area opposite the Challenge bank and obviously the computer shop, you know, it's much more high profile. Um at ECU Churchlands we are the only financial institution there although Bankwest have an ATM there. At Curtin, we been told that the Bankwest branch is going to cut back the staff levels to two. Interesting at Murdoch, the Bankwest, I think its Bankwest, they've actually gone into a brand new state of the art office with Foxtel and everything like that, we don't think that, {pause} we just can't see them getting their money's worth. They got quite a few staff in there. Every time I go there I wander past, in fact I've walked in a couple of times and they do not seem to be getting in any more people going in there than we've got at our fairly dowdy branch at Murdoch. To be quite honest with you, that's one of the things we'll be looking at, {pause} maybe sprucing that up a little bit in the coming months. So no in fact if anything, apart from what's happening at Murdoch, commonly the competition has somewhat decreased a little bit. But certainly the big impact over the last couple of years has been the move away from members coming into branches to using the Internet.

HM<sub>{159}</sub>: Is there any potential to acquire ATMs?

P2: No the cost is enormous for us, we being a small organisation. Probably all the best spots have gone. You've got to have a certain level of transactions, and generally there's probably, I mean unless there is a new area, no we don't. We certainly look at it, the board have discussed it. Um and we just see no potential. Our members can use other institutions ATMs, POS at the shops and things like that, um, we just don't see the need for it. It's just not viable from our point of view.

HM: And given these cost issues that you are constantly aware of are there any areas as far as IT is concerned where you think there might be room for cooperation?

P2: No more than we are sort of doing I suppose. Um, I'd say there is I suppose a close relationship within the credit union movement through CUSCAL but we've certainly never thought about perhaps forming a close alliance with any Financial Institution. We talk to each other and we've got regular meetings with each other, let me say for instance P1, I think there's a monthly meeting of all the general managers of all the credit unions, but from that point of view not getting any closer. You know it could be fraught with danger in some respects that we might find ourselves being the subject of merger talks or take over. We have been approached on a number of occasions but the board are very much of the mind that, they would like to see us, particularly as long as we can trade and make profits and keep members happy, there's no benefit to our members in merging at this stage. It's business as usual into the foreseeable future.

HM: Last question. If there was something that you could do \_\_\_\_\_ what would it be?

P2: I think I would say, {pause} I suppose it would be just to maybe refine our internet banking and we will actually be looking at that. You see there's very little we can do. We've always got to rely on external sources to facilitate our IT basically. Obviously being very small we've got limited resources. Um so I think really the future for us is just to make sure we do keep up with the latest innovations and latest technologies without obviously going overboard and with the financial constraints that we are under being a small organisation. We believe what we are doing and what we are offering our members from the IT side apart from not having ATMs is pretty well up with what the larger organisations are doing and our members are getting, from that point of view, pretty good service as if they were with CWB or Bankwest. The only area we could be falling down on is our representative branch network but that's become less and less of an issue for us probably the move towards more Internet banking and telephone banking has been to our benefit. It's something that we do offer our members.

HM: Well thank you for that.

\*\*\*\*\*END\*\*\*\*\*

Appendix 4-2

Field Notes and  
Observations

### **Contact Summary**

**Date:** 31 May 2002  
**Interviewee:** P1  
**Position:** Managing Director  
**Organisation:** CUC1

**What were the main issues or themes that you observed in this contact?**

- IT considered necessary for survival, but not going out of their way to acquire technology
- Direct involvement in IS/IT management in the organisation as there is no IS/IT manager
- Lack of a defined IS/IT strategy
- Complete outsourcing of core processing systems

**Summarise the information obtained (or failed to obtain) on each of the components of the model**

- a) IS/IT Portfolio
- N/A
- b) Organisational Performance
- N/A
- c) Key Considerations for SISP
- N/A
- d) Conversion Effectiveness
- N/A
- e) Organisational Context
- N/A

**Anything else that struck you as salient, interesting, illuminating or important?**

- CUC1 is able to utilise economies of scale and scope due to its membership of CUSCAL and this enables it to offer comparable and competitive services and products without having to acquire its own core processing system

**What new (or remaining) target questions do you have in considering the next contact in this case?**

- N/A

### **Contact Summary**

**Date:** 29 May 2002 and 05 June 2002  
**Interviewee:** P2  
**Position:** Manager Finance & Administration  
**Organisation:** CUCI

#### **What were the main issues or themes that you observed in this contact?**

- Very knowledgeable with respect to the firm's strategy moving forward
- Referred a great deal to the communications upgrade. He appears to be proud of it suggests he took/takes an active role in the process
- Appeared to have many ideas but understands the limitations of the organisations in terms of bringing these to fruition
- Would like to see more IS/IT used in the organisation
- IS/IT seen as critical to business

#### **Summarise the information obtained (or failed to obtain) on each of the components of the model**

- a) IS/IT Portfolio
  - Monthly uptime report
- b) Organisational Performance
  - Financial reports (97-01)
  - Member stats (possibly from 1?)
  - Number of employees
- c) Key Considerations for SISP
  - N/A
- d) Conversion Effectiveness
  - None
- e) Organisational Context
  - None

#### **Anything else that struck you as salient, interesting, illuminating or important?**

- Suggestion that the organisation has considered acquiring its own core processing systems
- No IS/IT Manager
- No obvious IS/IT strategy, more of a follower

#### **What new (or remaining) target questions do you have in considering the next contact in this case?**

- Some additional information, see 2 above.