

# Chapter IV

## Adoption and Implementation of IT Governance: Cases from Australian Higher Education

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### ABSTRACT

*This chapter introduces key IT governance concepts and industry standards and explores their adoption and implementation in the higher education environment. It shows that IT governance processes, structures and relational mechanisms adopted by these institutions generate value through improvements in a number of key focus areas for IT management. It is hoped that the study will inform both practitioners and researchers and lead to a better understanding of the relationship between IT governance structures, processes and relational mechanisms and business benefits.*

### INTRODUCTION

Over the past decade, IS/IT governance has become a key issue of concern for senior IT decision makers around the world. The underlying goals for adopting formal IT governance practices are improvement of business performance and conformance with regulations. This exploratory study

examines how IT governance is implemented in two Australian institutions through a number of structures, processes, and relational mechanisms and how industry best practice frameworks such as COBIT, ITIL, ISO17799 and ISO/IEC20000 have been utilized in the implementation. The study reveals a number of important findings in the context of the implementation of IT gover-

nance in the higher education environment. The relationship between IT governance adoption and implementation and business benefit issues will also be discussed in the chapter. The next few sections of this chapter contains a detailed literature review regarding IT governance, and the important IT related issues in the Australian higher education sector. This is followed by a discussion of the research questions and methodology and then the case study institutions are described. Finally, the findings from the study are presented and the conclusions and directions for future work are discussed.

## **BACKGROUND**

### **Corporate and IT Governance**

Corporate governance has become increasingly important worldwide, especially in the wake of the Enron and MCI WorldCom incidents in the US. The Australian Stock Exchange Corporate Governance Council defines corporate governance as “... *the system by which companies are directed and managed. It influences how the objectives of the company are set and achieved, how risk is monitored and assessed, and how performance is optimised*” (ASX, 2003). IT governance has increasingly become a key area of concern under the umbrella of corporate governance because of the pervasive influence of information systems and the associated technology infrastructure in every area of an organization’s activities. The IT Governance Institute describes IT governance as being an integral part of the corporate governance which consists of “the leadership and organizational structures and processes that ensure an organization’s IT sustains and extends the organization’s strategy and objectives” (ITGI, 2003).

### **Previous Research in IT Governance Implementation**

The term IT governance, started to appear in the research literature towards the late 1990’s, with its main proponent being the IT Governance Research Institute (De Haes & Van Grembergen, 2005). Recent surveys suggest that the need to implement and improve IT governance has been receiving growing recognition amongst senior IT management across the world. A survey of top 10 priorities for senior IT management by Gartner Inc. in 2003, found the need for improving IT governance to be included in the list for the first time (De Haes & Van Grembergen, 2004). Surveys of members of the Society of Information Management (SIM) in 2003, 2004 and 2005 also revealed that IT governance was amongst the top ten concerns of IT executives (Luftman, 2005; Luftman, Kempaiah & Nash, 2006). However, implementing IT governance can be an extremely complex undertaking (Brown, 1997; De Haes & Van Grembergen, 2004; Duffy, 2002; Marshall & McKay, 2003; Sambamurthy & Zmud, 1999; Weill & Ross, 2005). In 2003, a survey conducted by the IT Governance Institute through PricewaterhouseCoopers of 335 CEO/CIO level executives around the world showed a lag in practice (ITGI, 2004). The survey found that while 75% executives recognized the requirement for implementing IT governance only 40% were taking any action in this direction. This may be explained by the complexities of implementing IT governance.

While previous research on IT governance implementation focussed on IT governance structures and associated contingency factors (e.g., Brown, 1997; Sambamurthy & Zmud, 1999), later work has identified a number of different mechanisms for implementing IT governance (De Haes & Van Grembergen, 2004; Weill & Ross, 2005). This chapter adapts the framework presented by De Haes & Van Grembergen (2004) to explore IT governance implementations in the higher

education sector. Based on the work of Peterson (2004), De Haes and Van Grembergen (2004) propose that IT governance can be implemented through a framework of structures, processes, and relational mechanisms. Structures include the existence of well defined roles and responsibilities and IT steering committees. Processes involve strategic decision making and the use of various IT governance frameworks and standards (e.g., COBIT and ITIL) which can provide the IS organisation with the means of examining its activities and its value to business. Relational mechanisms include shared learning and strategic dialogue between business and IT, and ensuring proper communications at all times.

The structures, processes and relational mechanisms are also divided into tactics or roles and mechanisms or means to implement IT governance (De Haes & Van Grembergen, 2004). For example, the tactics for structures are to form IT executives, committees and councils. The mechanisms are to ensure that there is an IT organisation structure; roles and responsibilities are assigned, a CIO appointed, and the formation of an IT strategy or steering committee. As for processes, the tactics are to ensure that strategic IT decision making and monitoring are formed. This may be accomplished by setting mechanisms such as strategic information systems planning, balanced IT scorecards, service level agreement, COBIT, ITIL and IT alignment of governance maturity models, that would enhanced the processes of implementing IT governance. Finally, relational mechanisms are required to ensure participation from stakeholders, businesses and IT. This is required to ensure an on-going dialogue with the main players. The mechanisms to ensure a smooth running of this include a shared understanding of business/IT objectives, nonavoidance conflict resolution, crossfunctional business/IT training, and crossfunctional business/IT job rotation.

### **International Standards and Commercially Available Frameworks for IT Governance and Management**

A number of IT best practice frameworks and standards such as Control Objectives for Information and Related Technology (COBIT), ISO/IEC 17799, IT Infrastructure Library (ITIL) and Capability Maturity Model (CMM) are available to IT organizations to help them improve their accountability, governance, and management. COBIT is designed by the IT Governance Institute as a high-level “umbrella” framework for IT governance and it works very well with other frameworks like ITIL and ISO/IEC 17799 which focus on specific aspects of IT management. The framework identifies 34 IT processes over 300 control objectives across four IT domains: (1) planning and organization, (2) acquisition and implementation, (3) delivery and support, and (4) monitoring (ITGI, 2000; 2005). The planning and organization domain addresses strategic and tactical issues and how IT can optimally contribute to achieving business goals. The acquisition and implementation domain deals with the development or acquisition of IT solutions, as well as their implementation and integration with business processes. This domain also covers the maintenance of existing systems. The delivery and support domain covers the actual delivery of services ranging from security and continuity related operations to training. Support processes are required to ensure the delivery of services. The monitoring domain addresses the issue of management oversight of the organization’s control processes and the need for independent audits. The IT Governance Institute has recently published the fourth edition of COBIT, the first update since 2000. It is described as an incremental improvement on COBIT 3.0 and provides a number of useful additions to the older version (Bodner, 2006; Symons, 2006).

The IT Infrastructure Library (ITIL) is a comprehensive documentation providing guidance regarding best practices for IT service management (ITIL, 2007a; 2007b). The Central Computer and Telecommunication Agency (CCTA) in the UK established the Information Technology Infrastructure Library (ITIL) in 1989 (Sallé, 2004) in order to improve its IT organization. At present the UK's Office of Government Commerce (OGC) is responsible for managing ITIL. ITIL is also supported by the IT Service Management Forum (itSMF). In 2000 the OGC, in collaboration with the British Standards Institution (BSI) and itSMF, revised ITIL in order to integrate it with the BSI Management Overview, the BSI specification for service management (BS 15000-1) and the BSI code of practice for service management (BS15000-1) (ITIL, 2007a). The BSI Management Overview provides a high level introduction to ITIL, while the ITIL books expand on the information and provide guidance regarding the subjects addressed within BS15000. BS15000 has now been replaced by ISO/IEC 20000:2005. Like its predecessor, ISO/IEC 20000 is a two part standard (ISO, 2005a). The first part specifies requirements for IT service management while the second part provides a code of practice. The ITIL documentation, now available in version three, takes a lifecycle approach to guidance (ITIL, 2007b). It is organized around five core titles: (1) Service Strategy which provides a view of ITIL that ensures that all elements of the Service Lifecycle is focused on customer outcomes, (2) Service Design which provides guidance for producing and maintaining IT architectures and policies and documents for designing appropriate IT infrastructure service processes and solutions (3) Service Transition which provides guidance for the transition of services in the business environment, (4) Service Operation which details control and delivery activities for achieving excellence in daily operations, and (5) Continual Service Improvement which focuses on the process of

identifying and introducing improvements to service managements.

Another standard that can be implemented alongside COBIT and ITIL is ISO/IEC 17799:2005 (expected to be renamed ISO/IEC 27002 in 2007/08). The standard was originally developed from BS 7799 which provides a code of practice for developing information security standards in an organization (ISO, 2000). However, unlike COBIT and ITIL, it was not designed to be a certification standard. It has recently released a companion standard, ISO/IEC 27001 that can be used for the purpose of certification instead of the older and superseded BS 7799-2 on which it is based (ISO, 2005b). A new risk management standard BS 7799-3:2006 is also presently available from the British Standards Institute. This standard provides support and guidance for the risk management aspect of ISO/IEC 27001:2005.

In addition to these frameworks and international standards, Australian organizations have three local standards available to guide their IT governance and management practices. These are AS 8015-2005 (ICT governance standard), AS ISO/IEC 20000.1-2007 (specification for ICT service management) and AS ISO/IEC 20000.2-2007 (code of practice for ICT service management).

The ICT governance standard, AS 8015-2005, provides a set of guiding principles for senior business decision makers regarding the effective and efficient use of information and communication technology (ICT) within their organizations, irrespective of the industry sector. The standard addresses the governance of ICT resources for the provision of information and communication services within the enterprise (Standards Australia, 2005). The standard is currently in the process of being developed into an international standard. It has been accepted as a Draft International Standard (ISO/IEC DIS 29382) by the ISO in early 2007 (ISO, 2007).

Standards Australia (2007a; 2007b) provides a two part service management standard AS ISO/IEC 20000-2007. The first part (AS 20000.1-2007) outlines the requirements that a service provider needs to fulfil in order to deliver an acceptable quality of managed service to customers, while the second part (AS 20000.2-2007) recommends a common terminology for IT service providers, so that effective processes may be established. AS 20000.1-2007 is identical to ISO/IEC 20000.1-2005 and AS 20000.2-2007 is identical to ISO/IEC 20000.2-2005. They supersede AS 8018.1-2004 and AS 8018.2-2004.

Implementation of these frameworks may vary from one region to another. A recent Forrester Research survey of 135 IT managers in North America revealed that about 20% rely on COBIT while another 20% use ITIL (Dubie, 2005). A survey of 110 respondents by Cater-Steel and Tan (2005) at a recent Australian itSMF conference showed that while all respondents were at different stages of implementing ITIL, less than a third are also implementing COBIT. These frameworks are not necessarily mutually exclusive and increasing the value of IT from a business perspective requires an understanding of their strengths, weaknesses and focus (Symons, 2005). IT governance frameworks are being increasingly adopted around the world because they not only assure conformance with regulations but also help in ensuring performance (Liew, 2006). Organizations may benefit from adopting what they find useful from each framework rather than just adopting a single one (Chickowski, 2004).

There are, however, very few academic publications examining the issues and problems with the adoption and implementation of these frameworks and standards. Ridley, Young, and Carroll (2004) found that this to be particularly true in the case of publications related the COBIT framework, a majority of which tend to be practitioner publications. Cater-Steel and Tan (2005) make a similar observation regarding the available publications on ITIL.

### **Emergent Framework of IT Governance Mechanisms and Focus Areas**

The IT Governance Institute has identified five focus areas of IT governance (ITGI, 2005): (1) strategic alignment, (2) value delivery, (3) resource management, (4) risk management, and (5) performance measurement.

According to ITGI (2005, p. 6): Strategic alignment is about ensuring the linkage of business and IT plans; on defining, maintaining and validating the IT value proposition; and on aligning IT operations with enterprise operations. Value delivery is about executing the value proposition throughout the delivery cycle, ensuring that IT delivers the promised benefits against the strategy, concentrating on optimising costs and proving the intrinsic value of IT. Resource management is described as the optimal investment in, and the proper management of, critical IT resources in applications, information, infrastructure and people. Key issues of resource management relate to the optimisation of knowledge and infrastructure. Risk management is concerned with risk awareness by senior corporate officers, understanding of compliance requirements, transparency about the significant risks to the enterprise, and embedding of risk management responsibilities into the organisation. Performance measurement is about tracking and monitoring strategy implementation, project completion, resource usage, process performance and service delivery, using, for example, balanced scorecards that translate strategy into action to achieve goals measurable beyond conventional accounting.

The two primary concerns of IT governance, value delivery and risk management, are driven by strategic alignment and accountability concerns respectively. Both require adequate resources and need to be measured against the objectives of the business.

The emergent framework as illustrated in Figure 1 combines the framework of De Haes and

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Van Grembergen and the IT governance focus areas. In order for a business to be effective, the framework indicates that an organization's IT governance structures, processes and relational mechanisms must be set in place.

As mentioned previously, IT governance structures identify various roles and responsibilities in the context of IT governance in an organization (De Haes & Van Grembergen, 2004). Processes describe how those with appropriate responsibilities are involved in the governance rather than the day-to-day operational management of IT. Relational mechanisms ensure the success of structures and processes by addressing ways of improving the relationship between business and IT (De Haes & Van Grembergen, 2005). This suggests a dynamic relationship between these three components of IT governance as shown in Figure 1. Optimizing the balance between structures, processes and relational mechanisms could lead to substantial benefits for business through improvements in the five focus areas of IT governance identified by the IT Governance Institute (ITGI, 2005).

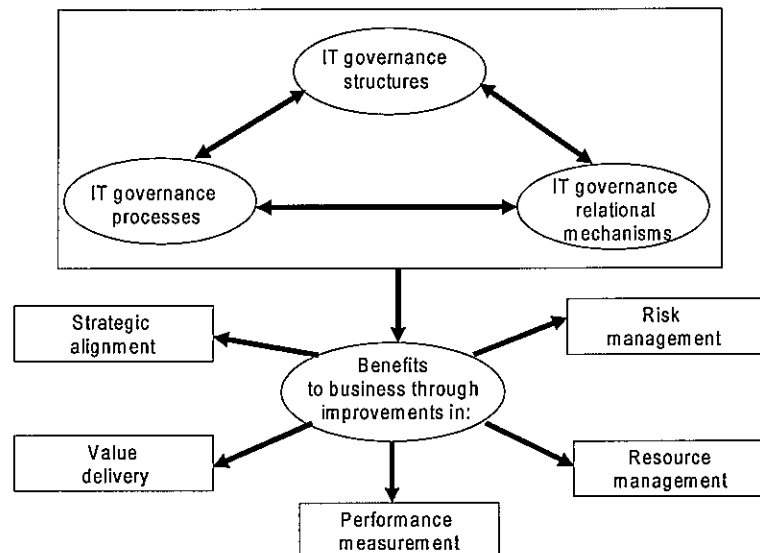
This study uses the framework presented in Figure 1 to explore the IT governance implementations in two institutions of higher education.

## IT Governance in Australian Institutions of Higher Education

Higher education is a multibillion dollar industry in Australia, and as such, it is of vital importance to the country's economy (Higher Education IT Consultative Forum, 2000; Nelson, 2002). It is both a major consumer of IT products and services as well as a major provider of services using ICT. IT has helped the improvement of a range of activities including research, teaching, learning and administration in the higher education environment. Significant developments have been made by these institutions in the area of online teaching and learning. The demand for IT based products and services, has also increased as a result of the rapid increase in student population in the last 15 years.

There is much work that needs to be done by university governing bodies and policy makers

Figure 1. The emerging IT governance and business benefits framework



in order for these universities to continue tapping emerging information technologies in order to maintain their competitive positions internationally (Higher Education IT Consultative Forum, 2000). The issues range from infrastructure, applications, delivery and services to staffing and appropriate regulatory frameworks. IT applications have also not yet penetrated all aspects of university teaching and more effort is required to bring about improvements in this area. However, despite the wide range of concerns facing IT governing bodies in Australian universities in the information economy, there has been very little research regarding how IT governance may be suitably implemented in these institutions in order for them to provide optimal benefits to higher education.

**RESEARCH QUESTION AND METHODOLOGY**

The chapter investigates the adoption and implementation of IT governance in two Australian institutions for higher education. The research question is:

*How is formal IT governance adopted and implemented within the higher education environment in Australia?*

As suggested by Benbasat, Goldstein, and Mead (1987), the case research method is useful for addressing the “how” questions, that is, in the exploratory stage of knowledge building. This is particularly useful for a study on IT governance in the context of institutions of higher education in Australia, where the knowledge of researchers regarding new methods, techniques, problems and prospects lags that of practitioners. A case research strategy is expected to provide rich insight in this context.

Two leading institutions of higher education in Australia in different stages of adopting and implementing formal IT governance practices were selected for the study based on the availability of senior IT and business decision makers in these institutions for participating in this research. The study was undertaken in 2006. In keeping with participants’ requests for anonymity, the institutions will be referred to as Institution A and Institution B in this chapter. The data collected was primarily qualitative in nature. The data was gathered from semi-structured interviews with senior IT and business decision makers in both institutions as well as from relevant documents obtained from interviewees and the websites of the institutions. The interviews were recorded and later transcribed and analysed. The data sources from the institutions are summarized in Table 1.

Table 1. Data sources from the two case study institutions

Institution	Interviewees	Documents
Institution A	<ul style="list-style-type: none"> <li>- 2 senior IT decision makers</li> <li>- 2 senior business decision makers</li> </ul>	<ul style="list-style-type: none"> <li>- Overall strategic plan and strategic IS plan</li> <li>- Disaster recovery plan</li> <li>- Organizational chart and committee structures</li> <li>- Security policies and procedures</li> <li>- Personnel statistics</li> <li>- Student satisfaction surveys</li> </ul>
Institution B	<ul style="list-style-type: none"> <li>- 2 senior IT decision makers</li> <li>- 1 senior business decision maker</li> </ul>	<ul style="list-style-type: none"> <li>- Overall strategic plan and strategic IS plan</li> <li>- Proposed IT governance model</li> <li>- Organizational chart and committee structures</li> <li>- Security policies and procedures</li> <li>- Personnel statistics</li> </ul>

## **THE CASE STUDY INSTITUTIONS**

Institution A was established in the 1960's. The institution has over 3,000 academic and administrative staff members and over 30,000 students. Its primary goals are to achieve excellence in teaching, learning, research and development. Its present priorities include providing flexible learning opportunities, developing facilities and technological infrastructure to support research priorities, forming partnerships with industry and government and improving its revenue generation. The institution has an overall strategic plan as well as a number of divisional plans and maintains a balanced scorecard. It has six academic divisions which are subdivided into several schools, centres and departments, as well as a number of support areas including central IT services, finance, and student and staff services. The institution is publicly funded, with annual revenue of around A\$400 million, 10% of which is spent on IT. The institution's IT history began in the 1960's, with the acquisition of a computer for the mathematics department. In the early 1970's, a computer system was installed primarily for teaching purposes. This was followed by the in-house development of an accounting package, signalling the first move towards corporate applications. The institution decided on continued development of both teaching and administrative applications, although these were to be handled separately. Since the various teaching and administrative divisions had specific application needs, the decisions regarding the procurement or development of applications lie with the divisions. In the late 1980s the institution received its first Australian Academic and Research Network (AARNET) connection and the use of email followed soon after.

Institution B was established in the early 1900's. It has over 2000 academic and administrative staff members and over 16,000 students. Like Institution A, it aims to advance teaching, learning and research. It has nine academic divisions and a number of support areas. The institution has an

overall strategic plan and a number of divisional plans. The publicly funded institution's annual revenue is around A\$500 million about 1.5% of which is spent on central IT and about 4.5% across the divisions. Divisional IT services and the library have separate IT budgets. Historically IT has been devolved to central administration, the academic divisions and the library.

In 1999 Institution A had an ICT review conducted by an external consulting firm. The review identified a devolved IT structure. A number of key issues including the negative impact of divergent IT directions in the divisions on overall corporate effectiveness, inadequate strategic planning and coordination related to ICT across the institution, inadequate ICT resources and lack of leadership at the senior level of senior management were reported in the review. As a direct result of the 1999 review, they adopted COBIT in the year 2000 to evaluate the current IT processes within the institution.

Institution B has recently adopted a formal IT governance model. In early 2006 they commissioned a new Strategy Manager and Director of IT to set up their IT governance model with an aim to centralize their IT governance structure. The next three sections explore the adoption and implementation of IT governance through a mixture of structures, processes and relational mechanisms in these two institutions.

As proposed in Figure 1, the institutions implement IT governance through a combination of structures, processes and relational mechanisms in different focus areas.

## **IT GOVERNANCE STRUCTURES**

IT governance structures include clearly defined roles and responsibility of IT executives to manage the IT structure within the organization (De Haes & Van Grembergen, 2004). This may include setting up of IT committees to oversee various IT strategies and functions of IT within the organization.



## **Institution A**

Currently, Institution A has about 200 staff members employed in the IT area. Of the 200 staff members, 100 are located in the central IT services and the other 100 within the divisions. Despite the observations made in the 1999 review it has not been possible to integrate the ICT across the institution into a single unit due to lack of an institution wide support for such a change. However, some enterprise wide standards for ICT have been developed and the need for compliance by the divisions has been recognized. Duplication of some services across the divisions remains a cause of significant concern and it is believed that considerable cost savings could result from avoiding such duplication.

Institution A has a formal reporting channel whereby the Director of central IT services reports to the Pro-Vice Chancellor. The role of the Director is primarily that of a technology professional though there is a growing realization of the need for the role to be more business oriented. The Director of central IT oversees three Associate Directors who are responsible in the infrastructure, applications and services areas respectively. A recent development has been the formation of the IT strategy committee, which reports to and advises the institution's planning and management committee. The IT strategy committee in its present form was established in mid 2005. It currently includes the Director of central IT services, representatives of all divisional IT groups, the Director of Finance, representatives from R&D, the Pro-Vice Chancellor and key stakeholders. The committee makes recommendations regarding the alignment of ICT with the goals of the institution, monitors the activities of the central and divisional IT service providers and fosters effective communication amongst them.

The formation of the IT strategy committee in mid 2005 and the development of the enterprise wide standards reflect the recognition by senior business and IT decision makers of the

need for a formal IT Governance model to support a centralized decision making structure. The shift from a devolved or decentralized IT structure to a centralized structure in Institution A is consistent with the results of a survey by Mendez (2005) of IT executives in Europe which showed a significant shift in the IT organization structure from decentralized or federated models to centralized ones.

Telecommunication and network related decision making in the institution has been centralized since the beginning. However, this has not been the case with desktop computers and servers because of the IT revolution in the 1980's. This has continued to this day, resulting in the institution's federated IT organization structure. There are six divisional IT groups which manage their own servers and desktop PCs independently of central IT. The divisional IT groups have independent funding and decision-making structures from central IT. Although they provide the same kind of services as the central IT group, their standards and practices may vary from those of central IT. Over the past year central IT has moved towards developing good relationships with divisional IT managers. This has helped in the achievement of some alignment between the central and divisional IT groups.

## **Institution B**

In Institution B, there are about 70 IT staff in central IT and a similar number spread over the nine divisions and the library. As in the case of Institution A, this structure has led to considerable duplication of IT staff efforts. IT has five major areas – administration including budget and staffing, strategy and governance, client services including desktop and student Internet support, systems services including database support and systems development, and technical services looking after network and servers. The managers of these areas report to the Director of IT who reports to the Director of Finance.

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Unlike Institution A, the role of the Director of IT in Institution B is that of a general business manager rather than a technology professional. This shift in the role for the Director of IT was decided in 2005 by the new Director of Finance based on his experience in the resources sector. It was believed that the position of the Director of IT required someone who clearly understood the business needs of the institution and has an overall technology focus.

A formal IT governance model specifying the various roles and responsibilities based on COBIT 4.0 was adopted at the beginning of 2006 when the new Strategy Manager was appointed. This model is now in the process of being implemented. The adoption of the model has led to a significant improvement in the involvement of business in IT decision making. The IT steering committee is expected to meet on a quarterly basis and provide an opportunity for communication on key IT issues amongst IT and business decision makers. The IT steering committee is advised by a technical advisory group which is comprised of all the central and divisional IT managers. Smaller working groups are also constituted from the divisional stakeholders and central IT staff as and when required for specific projects. The IT Director and Strategy Manager are responsible for decisions regarding standardization of IT infrastructure strategies and architecture. Decisions regarding business application needs are made by business decision makers with input from IT.

A summary of IT governance structures in Institution A and Institution B, based on the De

Haes and Van Grembergen framework is shown in Table 2.

**IT GOVERNANCE PROCESSES**

IT governance processes involve strategic decision making and the use of various performance monitoring frameworks and tools such as Strategic Information Systems Planning, COBIT, ITIL, Balanced Scorecard, Information Economics and others (De Haes & Van Grembergen, 2004).

**Institution A**

The institution has an overall strategic plan and follows a balanced scorecard. ICT has an ICT enabling plan, which is regularly updated. An important issue in this regard is that this ICT enabling plan is not directly associated with a budget for strategic expenditures. The present budget allocation for ICT is for staff, software licenses, site licenses, and refreshing the IT infrastructure. Although the need for a new document management system has been recognized by both IT and business decision makers, in order for the institution to improve its record keeping, appropriate funds for such procurement are yet to be acquired.

IT management decision making within the institution is influenced by the guiding principles of the Australian ICT governance standard AS 8015-2005 and the service management standards AS 8018.1-2004 and AS 8018.2-2004. COBIT 3.0

*Table 2. A summary of IT governance structures in the case study institutions*

	Structures	Institution A	Institution B
Tactics	<ul style="list-style-type: none"> <li>- IT executives and accounts</li> <li>- Committees and councils</li> </ul>	<ul style="list-style-type: none"> <li>- Yes</li> <li>- Yes</li> </ul>	<ul style="list-style-type: none"> <li>- Yes</li> <li>- Yes</li> </ul>
Mechanisms	<ul style="list-style-type: none"> <li>- Roles and responsibilities</li> <li>- IT organization structure</li> <li>- CIO on board</li> <li>- IT strategy committee</li> <li>- IT steering committee(s)</li> </ul>	<ul style="list-style-type: none"> <li>- Yes (evolving)</li> <li>- Yes (evolving)</li> <li>- No</li> <li>- Yes (recent)</li> <li>- No</li> </ul>	<ul style="list-style-type: none"> <li>- Yes (evolving)</li> <li>- Yes (evolving)</li> <li>- No</li> <li>- No</li> <li>- Yes (recent)</li> </ul>

has been adopted since the year 2000 for assessing and improving the institution's IT governance processes. A direct effect of this has been the realization by senior IT decision makers that the effective utilization of COBIT across the institution requires a more centralized IT governance environment. However, given the size of the COBIT 3.0 framework, only a small number of processes and objectives are identified for review each year. The objectives were initially based on a large number of interviews conducted across the campus in 2000 by IT staff. In subsequent years, objectives have been identified based on the original interviews and results of an annual survey of student and staff satisfaction on IT issues.

ITIL is used as the standard for service management. A number of operational level staff members have ITIL Foundation level training. The current focus is on getting better at incident management, change management, problem management, IT strategic planning and managing the IT architecture. The progress made has also been assessed against COBIT and ITIL. Consultative, Objective and Bi-functional Risk Analysis (COBRA), a software package, based on ISO17799 is being used for facilitating risk management.

Since COBIT requires the use of a standard project management methodology, Project Management Body of Knowledge (PMBOK) has been selected as the guide in this regard. Based on the perceptions of business decision makers, in the last two years IT has shown considerable maturity in project management and delivery. This is the result of adopting a strong project management methodology.

People Capability Maturity Model (P-CMM) is used as the standard of IT staff management and development. However, a lot of work is required in the area of staff development.

The value to business from the implementation of best practice frameworks has been in terms of reducing the number of ad-hoc processes, bringing a lot of discipline to IT support activities and improving accountability. Whilst IT has

made significant strides since the year 2000, the IT management recognizes that there is a long journey ahead.

One problem that has been faced in implementing the best practice frameworks like COBIT, which have high resource requirements, has been the shortage of adequate staff. The demand for staff time and services are also increasing. Most of the central IT teams find it difficult and at times challenging to achieve their operational objectives. Staffing in the server support area, for example, consists of about 10 people supporting 300 servers of various kinds, implementing changes to the infrastructure as well as managing large applications being used by thousands of people. Despite the staffing issue, however, process improvements continue to take place because of the continued commitment of senior IT management.

Another key area of difficulty has been that of finding appropriate performance metrics measurement. Currently, technical measures being used include percentage downtime, percentage access failure, the number of students accessing their email on a regular basis on the official communications channel and so on. One particular measure, the number of available desktops in the computer laboratories per student was found to be not particularly useful. It was found that when the number of desktops was doubled based on survey responses; the satisfaction level was actually lower than in the previous year. Management decision makers in the institution attribute this to the increasing expectations from ICT facilities with the rapid advances technology. The institution continues to work on developing balanced business-IT metrics.

## **Institution B**

While Institution A has been using COBIT 3.0 to evaluate and improve key IT processes, Institution B has utilized COBIT 4.0 to develop its overall IT governance model and outline the various roles and responsibilities. The development of the IT

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governance model has resulted in substantial involvement of business decision makers in making decisions regarding IT investment, risk and priorities. This has made it easier for business decision makers to appreciate the value of key decisions regarding IT. The initial problem faced in the implementation of the model was the lack of IT governance concepts amongst business decision makers and the resistance to change. This is gradually being overcome and the need for accountability for IT related decision making across the institution is better accepted. This is achieved by communicating to business decision makers their roles and responsibilities in IT related decision making for the benefit of the business, without making it necessary for them to know any technical details regarding COBIT.

COBIT is also being used for risk assessment and management. While ISO17799 provides guidance on what needs to be done in the context of security, COBIT guides management on how these goals should be achieved. The IT security manager has been trained in ISO17799 and will additionally undertake the security management training program provided by the developers of COBIT.

The institution has an overall strategic plan and central IT undertakes strategic information systems planning under the supervision of the IT steering committee. Service level agreements are in place for hosting and managing applica-

tion systems including the student system, the facilities management system, the HR and finance system.

At present there is a lack of enterprise-wide standards for infrastructure and applications. The key issues that IT intends to tackle over the next year include the lack of standards and controls and the existence of multiple help desks. As part of the central IT service desk project, it is planned to implement ITIL to handle change and incident management over the next few months. As part of the ITIL implementation service desk staff will be required to undertake ITIL Foundation level training. Capability is also being built up in the project management and business process analysis domain to reduce the current dependence on external consultants.

As in the case of Institution A there is difficulty in deciding on which metrics to measure. Current metrics being used include the number of service calls being answered to completion, the number of network and database administrators and the ratio of total IT cost to organizational cost. However, there is a realization that these metrics are not adequate for representing the value of IT to business.

A summary of IT governance processes in Institution A and Institution B, based on the De Haes and Van Grembergen framework is shown in Table 3.

*Table 3. A summary of IT governance processes in the case study institutions*

	Processes	Institution A	Institution B
Tactics	<ul style="list-style-type: none"> <li>-Strategic IT decision making</li> <li>-Strategic IT monitoring</li> </ul>	<ul style="list-style-type: none"> <li>-Yes</li> <li>-Yes</li> </ul>	<ul style="list-style-type: none"> <li>-Yes</li> <li>-Yes</li> </ul>
Mechanisms	<ul style="list-style-type: none"> <li>-Strategic IS planning</li> <li>-Balanced IT scorecards</li> <li>-Information economics</li> <li>-Service level agreements</li> <li>-COBIT and ITIL</li> <li>-IT alignment/ governance maturity models</li> </ul>	<ul style="list-style-type: none"> <li>-Yes (improving)</li> <li>-No (some technical measures)</li> <li>-No</li> <li>-No</li> <li>-Yes along with other standards since 2000</li> <li>-No (considered early days for maturity models)</li> </ul>	<ul style="list-style-type: none"> <li>-Yes (improving)</li> <li>-No (some technical measures)</li> <li>-No</li> <li>-Yes</li> <li>-COBIT with ISO17799 since early 2006</li> <li>-No (considered early days for maturity models)</li> </ul>

## **IT GOVERNANCE RELATIONAL MECHANISM**

Relational mechanisms according to De Haes and Van Grembergen (2004) include shared learning and strategic dialogue between business and IT, and ensuring proper communications at all times.

### **Institution A**

The key stakeholder groups for central IT include teaching staff, students, business process owners, research and development, and divisional IT management whilst those for divisional IT include teaching staff and students. There are efforts being made by central IT to improve the quality and frequency of communications with these groups.

Communications often take place at the tactical level. For instance, if a significant outage of services is being considered, divisional IT contacts and business process owners are informed and their responses are used to guide appropriate decision-making. In case of policy changes, e-mails are sent out by the particular group within IT that is responsible for that policy. The senior IT decision maker responsible for infrastructure also meets with the divisional IT management on a monthly basis. Over the last couple of years there has been emphasis on strategic level dialog. The monthly meetings of the newly formed ICT committee are also helping to improve communications between business and IT. This increased effort made by IT decision makers to liaise with business, has led to a growing perception of IT as a valued service provider rather than just a cost of doing business.

An area requiring further attention is staff development. Currently there is no staff retention program for IT staff and no opportunity for cross-training. There is also a need for increasing staff numbers in central IT. While an integration of IT services centrally might help solve the problem of

staff shortage, opposition at the divisional level has yet to be overcome.

### **Institution B**

Communication with key stakeholders is being considered to be of vital importance over the coming months in order to successfully implement the new IT governance model. The principal stakeholder groups for IT include the teaching staff, students, research and development, university administration, and the library. Communication with these groups is carried out through informal discussions, working groups and committee meetings. Unlike in previous years, conflicts between central IT and divisional IT are now actively resolved through discussions at the steering committee meetings.

The understanding of IT by business and vice versa is improving gradually and IT is emerging as an asset and a valued service provider. There has been a recent policy shift geared towards more balanced business and technical hiring within central IT.

A summary of IT governance relational mechanisms in Institution A and Institution B, based on the De Haes and Van Grembergen framework is shown in Table 4.

## **FINDINGS**

### **A Comparison Between Institutions A and B**

The chapter addresses the question of how formal IT governance practices can be adopted within the higher education environment. The increased dependence of IT in the higher education environment has also led to the awareness of the need for adopting formal IT governance practices. As seen in the previous sections both institutions have been implementing IT governance through a mixture of structures, processes and relational mechanisms.

## Adoption and Implementation of IT Governance

Table 4. A summary of IT governance relational mechanisms in the case study institutions

	Relational Mechanisms	Institution A	Institution B
Tactics	<ul style="list-style-type: none"> <li>- Stakeholder participation</li> <li>- Business/IT partnerships</li> <li>- Strategic dialog</li> <li>- Shared learning</li> </ul>	Improving on all counts	Improving on all counts
Mechanisms	<ul style="list-style-type: none"> <li>- Active participation by principal stakeholders</li> <li>- Collaboration between principal stakeholders</li> <li>- Partnership rewards and incentives</li> <li>- Business/IT co-location</li> <li>- Shared understanding of business/IT objectives</li> <li>- Active conflict resolution (non-avoidance)</li> <li>- Cross-functional business/IT training</li> <li>- Cross-functional business/IT job rotation</li> </ul>	<ul style="list-style-type: none"> <li>- Improving</li> <li>- Improving</li> <li>- No</li> <li>- Improving</li> <li>- Improving</li> <li>- Recent attempts</li> <li>- No</li> <li>- No</li> </ul>	<ul style="list-style-type: none"> <li>- Improving</li> <li>- Improving</li> <li>- No</li> <li>- Improving</li> <li>- Improving</li> <li>- Recent attempts</li> <li>- No</li> <li>- No</li> </ul>

Based on the experiences of Institutions A and B, the following findings emerge with regard to the implementation of IT governance:

1. Professionals in both institutions agree that while an institution of higher education has to deal with low staffing levels, this should not be a deterrent in adopting industry best practices. They also agree that instead of adopting any one best practice framework, it is important to evaluate the strengths and weaknesses of the business and selectively adopt a combination of the relevant elements of best practice frameworks and standards such as COBIT, ITIL, ISO17799, AS 8015-2005, AS 8018.1-2004 or AS 8018.2-2004 that are necessary to support the business.
2. The two institutions vary in their approach in implementing COBIT and in the version of COBIT being implemented. The application of COBIT 3.0 for improving individual processes was an important eye-opener for management in Institution A because it focused attention on the need for centralization of decision making, having well defined IT governance roles and responsibilities, and developing enterprise-wide standards. In Institution B the overall IT governance structure is being implemented based on the COBIT 4.0 framework. It is believed that this approach would help in the utilization of COBIT 4.0 for improving processes across the university rather than just at central IT.
3. Institutions of higher education may benefit from experiences gained in IT governance implementation in other industries. In the case of Institution B, the background of the Director of Finance in the resources sector helped in identifying the need for the role of the Director of IT to be more business oriented (a need also being gradually recognized in Institution A). The Strategy Manager's background in the finance sector helped in developing the governance model for the institution fairly quickly based on the COBIT 4.0 framework.
4. COBIT requires the use of a good project management methodology. Institution A's adoption of COBIT has led to its adoption of PMBOK. This was particularly important as the institution's IT staff does a considerable amount of the project implementation and delivery work in-house.
5. A key difference between COBIT and ITIL noted by professionals in both organizations is in the availability and cost of documentation. There is a considerable amount of COBIT related documentation and research papers available free of cost from the Information Systems Audit and Control Association

(ISACA) Website and additional information is available through mailing lists. ITIL documentation, on the other hand, is considerably more expensive.

6. Both institutions have realized that although the use of multiple learning management systems and multiple email systems may be the existing norm in the divisions, this leads to duplication of ICT staff efforts without increasing the satisfaction of staff and students across the institution. A consolidation of systems could potentially help in the reduction of staff numbers (leading to reduced costs) while providing a better direction for staff efforts.
7. In both institutions, the disparity in ICT services across the institutions lead to difficulties in managing the perceptions of students and staff. In Institution A, student dissatisfaction with ICT services at the divisional level is reflected on their perception of ICT in general in the annual surveys. A consolidation of services (e.g. helpdesks, printing) could help in maintaining the same standards of services across the institution (in both cases) and make it easier to manage perceptions.
8. In both institutions improving communication between central IT and divisional IT groups are helping in the general acceptance of central IT standards.
9. In both institutions improving communication between IT and business has led to the gradual acceptance of IT as a valued service provider rather than just a cost of doing business, in an institution whose core business is not IT.

### **The Relationship Between Structures, Processes and Relational Mechanisms**

As discussed previously, De Haes and Van Grembergen (2004) provide a broad framework for

implementing IT governance through a mixture of structures, processes and relational mechanisms. However they do not explicitly discuss the relations between these three and how they relate to business benefits. The findings of the study support the emerging framework presented in Figure 1.

The study suggests that the development of IT governance structures (eg. IT strategy committee) leads to improved relational mechanisms and the adoption of IT governance processes (eg. the implementation of best practice frameworks such as ITIL) across the enterprise. The findings associated with Institution A suggests that there is a need to have a formal IT Governance structure with clearly defined roles and responsibilities in order to facilitate the adopted IT governance processes. As discussed in the findings, Institution A is shifting to a centralized IT governance structure. By adopting a formal IT Governance structure, Institution A strives to strengthen relational mechanisms. Improving relational mechanisms through formal and informal communications ensures broader support for improving IT governance structures and processes. The findings associated with Institution B affirms the framework as shown in Figure 1 in that they used CobIT to guide, develop and establish a formal IT Governance model including various structures, processes and relational mechanisms. Whilst Institution B presently lacks enterprise-wide standards (e.g., architectural, service management), they plan to implement ITIL as the service management standard with their IT staff requiring to undertake ITIL Foundation level training. Institution B has also considered key stakeholders to be vital and this has resulted in a policy geared towards a more balanced between business and IT hiring within central IT. While the institutions are in the early stages of experiencing business benefits from their evolving structures, processes and relational mechanisms, a longitudinal study would shed further light on the benefits of their IT governance practices.

The study also suggests that the range of structures, processes and relational mechanisms implemented by each organisation may differ from those presented in the De Haes and Van Grembergen (2004) framework.

### **The Five Focus Areas of IT Governance**

The focus of IT governance implementation in the two institutions seems to be on five key areas as shown in Figure 1.

IT governance in the two institutions is implemented through a number of processes, structures and relational mechanisms in the context of these five areas. The focus area of strategic alignment in the four institutions appears to be addressed through processes such as strategic IS planning and the adoption and implementation of industry frameworks such as ITIL and COBIT that help in the attainment of business objectives. Structures like steering committees are used to involve business decision makers in strategic level IT decision-making. This growing interaction between business and IT is helping to build a shared understanding between business and IT on key issues. This is an important relational mechanism in the De Haes and Van Grembergen framework (2004).

With respect to value delivery (Figure 1), the adoption of standards such as PMBOK and ITIL for improving project management and service delivery was found to be an important process. While ITIL has been adopted by both institutions, PMBOK appears to have been adopted by institutions A only. Attention given by management to ensure staff training was found to be an important relational mechanism.

COBIT and ISO17799 were found to have been adopted by institutions A and B for risk management purposes. The adoption of P-CMM is guiding the management of human resources in institution A. It must be noted that although both institutions had reasonably well understood roles and responsibilities for the management of key

resources such as business applications and supporting infrastructure, the institutions are all yet to have a formal documented governance model in place clearly outlining these structures.

As in other industries measuring the performance of IT remains a big challenge for IT decision makers in institutions of higher education and suitable measures are gradually being developed. COBIT has been used for evaluating IT process maturity in Institution A.

While there has been progress in all five focus areas, the development of formal governance models with input from key business decision makers could help in continuing to generate value for business in the two institutions.

### **LIMITATIONS AND FUTURE WORK**

The study focuses on the implementation of structures, processes and relational mechanisms in two institutions of higher education and the focus areas for these implementations. It does not seek to address specific educational market drivers influencing IT governance implementations or the operational management issues that a well designed IT governance model helps to facilitate. Future research in these directions as well as on the integration of IT and corporate governance in the higher education sector would help in strengthening the findings. Further longitudinal investigations of IT governance practices in the higher education sector would help in testing the IT governance-business benefits framework presented in Figure 1 and addressing the present limitations of the study.

### **CONCLUSION**

The chapter highlights some key issues regarding the adoption of formal IT governance practices in the higher education sector for the benefit of practitioners, academics, and researchers. As



discussed in the previous section, the findings of study provide support for the framework presented in Figure 1. Institutions A and B were found to have implemented IT governance through a combination of various structures, processes and relational mechanisms. Benefits to business in the two institutions were found to arise from improvements in strategic alignment, value delivery, performance measurement, resource and risk management as the various mechanisms of IT governance evolve in these institutions. However, it must be noted that as both institutions are in the process of developing their formal governance models and the extent of benefits from IT governance may become more clearly understood in the future. One of the institutions has already received feedback from the authors regarding the findings of the study and is in the process of implementing some of the recommendations.

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