

Department of Media and Information

**An Investigation into Methods for Capturing Corporate
Knowledge in an Australian Local Government Context**

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DECLARATION

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

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

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ABSTRACT

This research project investigates the processes of capturing corporate knowledge in an Australian local government context. The City of Perth, the capital city local government of Perth, Western Australia, is the organisation within which this study was conducted. A qualitative research methodology was utilised for this study in order to understand all the factors involved in knowledge sharing, including the human aspects. Data was collected exclusively through structured interviews consisting of a series of open questions. Digital transcripts of these interviews were produced and analysed by the researcher using qualitative data analysis software.

The application of the research methodology has produced a rich set of results. The different types and sources of corporate knowledge used by participants and their views on knowledge capture processes are explored. Participants provide insight into their motivations in undertaking knowledge capture, the extent knowledge is shared in the organisation and barriers to sharing knowledge that they had encountered. The utilisation of the organisation's information management processes and the overall purposes of knowledge capture were also explored by the study. Some of the results are quite predictable and generally supported by the literature, such as a preference for interpersonal communication in the sharing of knowledge. Other results are more unexpected including strongly expressed altruistic support for the good of the employing organisation as their motivation in supporting knowledge management activities and an understanding of the need for knowledge codification.

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CHAPTER ONE: INTRODUCTION

In the text *Sleepers, wake!: Technology and the future of work*, Barry Jones (1990) first introduced to Australia the concept of an Information Society. Western countries are displaying a definite trend towards a society where information is the main commodity and agrarian and industrial sectors take a back seat. When information is an organisation's most valuable resource and provides their competitive advantage in the market place, the effective management and use of this resource will play a large role in the success of an organisation.

In today's society, education and learning are an essential component of our personal growth and a vital ingredient for the growth and development of our organisations. Throughout our lives we gather, receive, store and use information. This information is interpreted, evaluated, classified and stored for future use. The storage, retrieval and application of this information provide us with our knowledge.

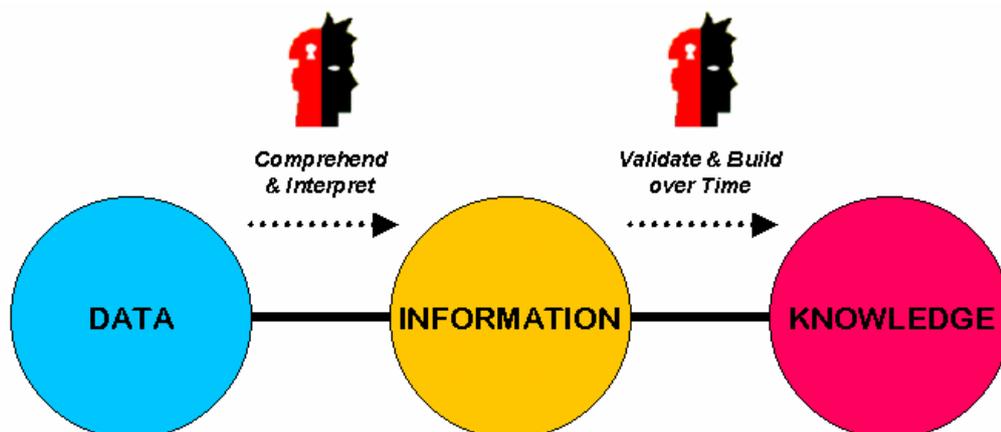


Figure 1: Data, Information & Knowledge

We often use the terms *data & information* and *information & knowledge* interchangeably. In the context of this study, however, the meanings of these terms are quite different. Data can be considered to be the most basic building blocks of communication and may be comprised of such things as raw numbers, text or sounds. Data is fairly meaningless when viewed in

isolation. Information is data that has been interpreted by someone, placed into context and provided with some meaning. Knowledge is the acquisition of significant quantities of authoritative information that has been built up over time, tested and validated. Knowledge can include “*such diverse cognitive terms as ‘hypotheses’, ‘judgements’, ‘inferences’, ‘attributions’, ‘perceptions’, ‘attitudes’, ‘preferences’, ‘values’, ‘ideologies’, ‘goals’, or ‘intentions’*” (Bar-Tal & Kruglanski, 1988, p.3).

Standards Australia (2001, p.7) defines Knowledge Management as “*a multi-disciplined approach to achieving organisational objectives by making the best use of knowledge – it focuses on processes such as acquiring, creating and sharing knowledge and the cultural and technical foundations that support them. The aim of knowledge management is to align knowledge processes with organisational objectives.*”

If you look at knowledge management as a process, it would begin with the acquisition of knowledge. Knowledge may be acquired from education, training, and experience or simply by communicating with colleagues. Organisations and even individuals often take their knowledge for granted, so it is important that once knowledge has been acquired it is identified. Only once knowledge has been identified can an organisation attempt to capture it. One way to capture corporate knowledge is to codify it so that it may be shared and managed using the information management lifecycle. Information supports and feeds knowledge; by retrieving and using information an organisation can utilise the knowledge stored in its information resources. Organisations continually build and develop corporate knowledge through the acquisition of new information, the application of existing information and the use of existing knowledge.

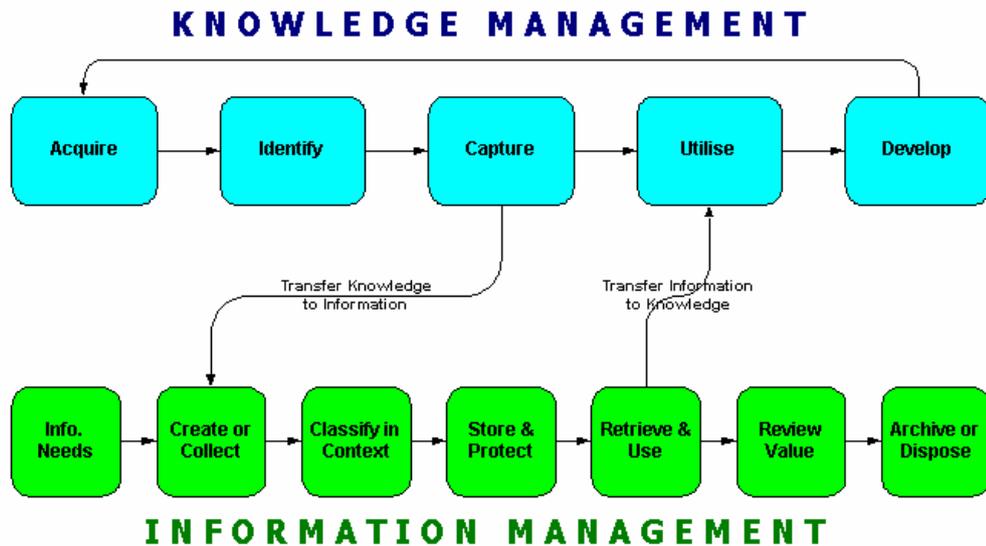


Figure 2: Information & Knowledge Management Processes

Knowledge capture can be thought of as the process of making tacit knowledge (that is knowledge that only exists within an individual’s mind) into an explicit form that can be more easily communicated and shared over time. (Cowan and Foray, 1997). There has been much debate over the concept of knowledge capture, with some arguing that knowledge is perhaps something that cannot be captured at all, only shared between individuals. While it may not be possible or economical to capture some forms of knowledge, this research project explores the possibilities and limitations of tacit to explicit knowledge capture methods. This project recognises that successful knowledge capture is highly dependent on a supportive organisational culture in addition to well designed processes.

Research Objective

This research project investigates the following problem:

How do the processes of capturing corporate knowledge operate in an Australian local government context?

The specific objectives of this study were to:

- Explore methods for capturing different types of corporate knowledge;
- Describe various environmental or cultural factors that positively or negatively affect the capture of corporate knowledge; and

- Examine methods of encouraging individuals and teams to capture corporate knowledge.

Research Questions

To effectively explore the research problem described above, the following questions were considered during the course of this study:

- What different types of corporate knowledge are needed by people working in local government to perform their duties?
- What are the key sources of corporate knowledge in local government?
- How do people capture corporate knowledge in local government?
- What are the benefits and challenges of different knowledge capture methods?
- What motivates people to capture corporate knowledge?
- To what extent is knowledge shared in local government?
- What barriers to knowledge sharing exist in local government?
- How are information management processes utilised by people working in local government?
- What do people in local government hope to achieve from the capture of their corporate knowledge?

Research Assumptions

The following assumptions have been made by this research project:

- Local government primarily resides in the information sector and is comprised of many information and knowledge workers.
- The capture of corporate knowledge is a valuable exercise for local government.
- People in local government will be able to identify corporate knowledge when provided with appropriate tools and techniques.
- Corporate knowledge exists in local government in more than one form with different characteristics.
- Local government can capture at least some forms of corporate knowledge.

- Environmental and cultural factors inherent in local government will affect the capture of knowledge.
- People in local government can be encouraged and motivated to capture knowledge.

Population Study Approach

This research project was conducted as a study of a defined population in a single organisation. Despite this it cannot be described as a case study, since the study does not attempt to provide a complete or complex description of the organisation. Instead the organisation has been used to provide a definable and discrete population of persons whose organisational role is relevant to the specific research objectives of this study. The term population study is used in this context as the most accurate description of the research method used.

The population consists of the staff of the City of Perth, the capital city local government of Perth, Western Australia. This organisation is described in Chapter Three: Background. The City of Perth operates a knowledge management program to develop processes to manage its corporate knowledge and foster a knowledge-sharing culture. The City's "Corporate Knowledge Program" is also detailed in Chapter Three.

This study was an independent research project conducted by the researcher through Curtin University of Technology. The project was supported by the City of Perth and conducted against the background of its knowledge management program, but was separate from that program and designed to produce results which would contribute to a general understanding of knowledge management within local government. The researcher, Kye O'Donnell, held the position of Records Services Team Leader at the City of Perth between 2000 and 2007. During this time he implemented a document imaging system and an integrated electronic document management system, as well as establishing its knowledge management program. As the researcher was employed by the City of Perth, relevant ethical controls were

established at the start of the project, as detailed in Chapter Four: Methodology.

Intended Audience

The intended audience for this research incorporates all Australian local governments and related associations and government bodies that have an interest in the management of corporate knowledge in local government. It is hoped that the results of this study will also be relevant to organisations in other sectors, both locally and internationally.

CHAPTER TWO: LITERATURE REVIEW

Although much has been published on the topic of Knowledge Management, the majority of the literature tends to discuss the broader issues of what knowledge management means and how it relates to other disciplines such as Information Systems, Information Management, Human Resources and Customer Relationship Management. The work of authors such as Davenport and Prusak (1998) and Nonaka and Takeuchi (1995) has been immensely influential in its attempts to discuss all aspects of knowledge management in organisations. No attempt is made in this thesis to assess this broader range of knowledge management literature. The literature provides numerous definitions and theoretical models, but little detail on actual methods of capturing and sharing corporate knowledge in an organisation. Furthermore, no literature was found that discussed how knowledge capture methods are used in a local government context.

Four key themes relevant to this research were identified by the literature review. Firstly, a well-established theme that sets a basic foundation for any research into knowledge management is that of **epistemology**, or the study of knowledge. Another theme is that of **knowledge codification**, the process of making tacit knowledge explicit. A third theme, which seems to have developed out of some of the deficiencies identified with knowledge codification, is that of **knowledge transfer**, the process of transferring specific knowledge between people, groups or organisations. The last theme identified is that of **knowledge systems**, which examines the development of IT-based systems to capture and manage knowledge. Each of these four themes is discussed below in relation to the literature reviewed during the first stage of this research.

Epistemology

Epistemology is the theory of knowledge, a philosophical view of what knowledge is and the concept of 'knowing'. The term is derived from 'epistēmē', the Greek word for knowledge. According to the *Oxford*

Handbook of Epistemology (Moser, 2002), epistemology focuses on the nature, origin and scope of knowledge. It is evident from the literature that knowledge is a very abstract concept that is difficult to define. The concepts and models discussed in the epistemological texts however provide some valuable insights into what knowledge is. Morton (1997) provides a clear introduction to the study of epistemology in his text *A Guide through the Theory of Knowledge*. Some of the key concepts that form the foundation of epistemology include coherence, evidence, rationalism, justification and truth. These and other related concepts presented by Morton are briefly described in the sub sections below.

Coherence & Beliefs

Coherence is an epistemic ideal concerning a combined set of beliefs that make a unified and logically consistent system. The beliefs when considered independently or as a whole make sense. Beliefs may be either rational or irrational. A rational belief considers all evidence in a balanced way and does not make major assumptions or conclude more than what the evidence provides. Beliefs may also be either true or false. An irrational belief may be true and a rational belief may be false. There may be strong evidence to form a rational belief that is in fact false and conversely there may be inadequate evidence resulting in a belief that is irrational, but true.

Evidence & Reasoning

The common purpose of evidence is to convince another person to change their mind from belief to disbelief, from disbelief to belief or from neutrality to either. Evidence therefore needs to be believable by the people you are trying to convince so that if the person considers the evidence in a rational way they will have reason to change their belief. Reasoning is the process of considering evidence to form or change a belief. Arguments use reasoning to persuade someone to change their belief.

Justified & True

Beliefs may be justified or unjustified. A belief is justified if it has been formed based on the information that the person has available to them at the time. If someone has only false information then his or her belief may be both justified and false. A belief is unjustified if it is incongruent with the information they have available to them. If someone has evidence that would disprove his or her own belief then that belief is unjustified. A true belief can be formed by irrational reasoning that can't be justified. A false belief can be formed by rational reasoning that can be justified. Two opposing beliefs can both be justified and rational, but only one can be true.

Sense-data or data received through eyes, ears, nose and touch is often considered to be a good source of evidence to justify beliefs. However sense-data doesn't produce a belief on its own. A belief is produced when sense-data is combined with existing beliefs. It may be more correct, however, to say that it produces an appearance rather than a belief. Is sense-data really a good source of evidence if it requires existing beliefs to be understood?

A Priori & A Posteriori

A priori knowledge (from Latin meaning prior to the evidence) is knowledge that is gained just by thinking in advance of any evidence being produced. Knowledge gained from mathematics is a common example of *a priori* knowledge. *A posteriori* knowledge (from Latin meaning after the evidence) is the opposite of *a priori* knowledge, it is knowledge which is gained after seeing the evidence. We always have *a priori* beliefs but at different times we treat different beliefs as *a priori*.

Reasoning can be used to destroy existing beliefs, to explore existing beliefs to understand them better, or to accumulate new beliefs. Some beliefs are considered to be necessary. That is they are beliefs that not only are true, they have to be true. They can not be false. Inductive reasoning uses the observation of patterns to create *a priori* knowledge. As our knowledge grows

we may need to discard existing beliefs, however the understanding that we gained from those beliefs remains.

Qualities of High Quality Knowledge

Knowledge, according to a simple epistemological definition is a 'high quality' belief that is both true and justified. Lehrer's principle (Lehrer, 2000) provides a more complex method of determining if a belief is knowledge. If a belief is based on reasoning, then it qualifies as knowledge if, and only if, it does not depend on any chain of reasoning that has a false step at middle, beginning or end. The likelihood of a belief being knowledge can be measured using probability theory. The probability of an event (or a belief being true) can be determined by measuring the strength of the evidence that supports the belief.

According to Morton (1997), high quality beliefs should possess the following internal and external qualities:

- Internal:
 1. truth,
 2. reliability,
 3. fact-tracking, and
 4. usability by others.
- External:
 1. justification,
 2. coherence,
 3. reasonability, and
 4. not be undermined by others' beliefs.

The theory of knowledge is complex but well established and has been thoroughly explored and defined in the epistemological literature. While the study of knowledge is by no means new, the recognition within organisations of knowledge as a corporate asset is. 'Knowledge Management' has recently become a popular concept as the development of this field of study has emerged as a legitimate management practice. In their seminal work on

knowledge management, Davenport and Prusak (1998) clearly link these two fields of study when they say that knowledge is not new; it's what makes organisations go. An understanding of the fundamental nature of knowledge is essential if one is to consider effective methods for capturing this asset in an organisation.

Knowledge Codification

An important concept in most knowledge management literature is the classification of knowledge as either tacit or explicit (Bénézech *et al.*, 2001). Tacit knowledge is knowledge that only exists in the mind of an individual, whereas explicit knowledge is knowledge that has been articulated by an individual in some way. Knowledge codification is the process of making tacit knowledge explicit. Numerous authors have considered the differences between tacit and explicit knowledge and, recognising the benefits of knowledge in its explicit form, explore how codification processes can be used to capture the knowledge of individuals. Literature in this area concentrates on documentation processes, language used to articulate knowledge and how codified knowledge is classified for ease of access.

What is Codification?

Knowledge codification is articulated by Cowan and Foray (1997, p.596) as *“the process of conversion of knowledge into messages which can be then processed as information”*. Prencipe and Tell (2001, p.1379) describe how this process results in *“codified systems of symbols [which] allow for storage and transfer across time and space”*. They believe that the outcomes of knowledge codification are often emphasised in the literature, while the cognitive process of codification is not usually considered. Prencipe and Tell describe three learning processes; (1) experience accumulation, (2) knowledge articulation and (3) knowledge codification. They believe that knowledge codification should be viewed as an extension of articulation and state that the codification of knowledge requires individuals to use their creativity and the use of *“internal selection processes”*. (2001, p.1379)

Bénézech *et al.* (2001) describe knowledge codification in the context of the ISO 9000 quality management systems standard (International Organization for Standardization, 2005). They explain how the standard's certification process requires the gathering of explicit knowledge and the codification of tacit knowledge regarding an organisation's products, processes and management. Three main types of tacit knowledge for codification were identified in the article. These types were (1) conceptual knowledge, (2) observational and experimental knowledge and (3) learning knowledge, which demonstrate a clear connection to concepts in the epistemological texts discussed under the first theme.

Codification Process

Specific methods of knowledge codification are often not discussed in detail in the literature; however some authors describe the codification process in general terms. Bénézech *et al.* (2001, p.1398) for example, describe what they call a "*team of knowledge creation*" that is comprised of four types of people who perform different roles in the knowledge codification process. These people are (1) *officers of knowledge* who promote codification, (2) *specialists of knowledge* who conduct conversion, (3) *knowledge engineers* who improve the codified knowledge in terms of its accessibility and useability, and (4) *knowledge practitioners* who internalise codified knowledge and apply it to their work.

Benefits

A number of authors discuss the benefits of making tacit knowledge explicit through codification processes. Zucker, Darby and Armstrong (2002) conclude that as the tacitness of knowledge decreases, knowledge transfer between individuals becomes easier. Prencipe and Tell (2001, p.1379) discuss the economic benefits of knowledge codification that come from the re-use and diffusion of knowledge in an organisation; what they refer to as the "*economics of information*".

Bénézech *et al.* (2001) found that the involvement of individual staff in the knowledge codification process increases the likelihood of them utilising that knowledge. The process of making their tacit knowledge explicit serves to highlight the knowledge they have, thus encouraging them to use it more frequently and with greater confidence. Lundh-Snis and Sorensen (2001) argue that knowledge codification can also result in innovation. While they acknowledge that knowledge capture doesn't equate with knowledge creation, they believe that the codification process can lead to the creation of new knowledge.

Challenges

The challenges of codifying knowledge are also discussed by a number of authors. Zucker, Darby and Armstrong (2002) argue that if knowledge is completely new (i.e. a breakthrough) it is much more difficult and time consuming to codify it. Knowledge that builds upon pre-existing knowledge on the other hand is far easier to codify and so is more likely to occur. The greater the disconnect between old and new knowledge the harder it is to transfer it from tacit to explicit form. They also found that codification time lags tend to increase with the value of the knowledge, as people will tend to opt for the creation of more new knowledge rather than spend time codifying. Bresnen *et al.* (2003) explain how product innovations tend to be codified in designs and artefacts, whereas process innovations were less likely to be codified and often only exist in a tacit state.

Nissen, Kamel, and Sengupta (2000) describe what they believe is the greatest challenge with knowledge codification. They argue that knowledge codification is essentially an 'upstream' activity, which occurs at the beginning of a process; whereas the use of the codified knowledge is a 'downstream' activity which occurs in the future. The cost of knowledge capture can be high, with the benefits only being realised at a future point in time, often by a different stakeholder. They conclude that appropriate organisational incentives must be provided to encourage individuals to capture knowledge. Often individuals capturing their knowledge within organisations have little personal use for codified forms of this knowledge,

especially for corporate knowledge which they may consider to be very basic or routine. It is important, therefore, that the reasons people capture corporate knowledge is understood so that organisations can develop programs that make use of people's existing motivations.

As codification processes typically rely on the use of language, Brady and Marshall (2001) believe that linguistic issues pose a significant challenge for knowledge codification. They explain how linguistic meaning is never complete and final, but rather unstable and open to endless interpretation, especially over time. Milton *et al.* (1999) argue however that a glossary of key terminology with descriptions and synonyms can overcome some of these linguistic problems.

Personalisation versus Codification

When balancing the benefits and challenges of knowledge codification processes, some authors compare the use of 'personalisation' strategies with codification. Prencipe and Tell (2001) identify two knowledge management strategies. One strategy is codification, where knowledge is stored somewhere for future use and the other is personalisation, where knowledge is transferred directly from person to person. Brady and Marshall (2001) claim that preoccupation with codification strategies distracts away from the dynamic and socially-situated character of knowledge. Prencipe and Tell (2001) argue, however, that for person to person knowledge transfer to occur, people need to have an existing relationship with the person. If you don't know the person you are unlikely to approach them, and so this could make this type of transfer difficult in large or multi-unit organisations.

The codification of knowledge has long been discussed as a method of capturing tacit knowledge to make it more easily accessible to both current and future staff in an organisation. The benefits have been experienced and described by a number of authors however significant challenges have also been discussed. Perhaps a greater focus on specific methods of knowledge codification would result in an improved understanding of this topic.

Knowledge Transfer

The authors cited above have identified deficiencies with the knowledge codification process and have advocated an alternative approach to the management of knowledge in organisations. This approach is based on identifying and transferring specific knowledge between people, groups or organisations by focusing on organisational politics, structures and people issues. Organisations can be viewed as networks of people through whom knowledge can be transferred. The success of such knowledge transfer is dependent on the 'embeddedness' of the knowledge in the group that it resides and the absorptive capacity of the receiver. An important question when devising methods of transferring knowledge between people is to ask, "Why do people share knowledge?"

Organisations as Networks of Communities

Tsai (2001) describes organisations as networks and explains how multi-unit organisations can be thought of as a network of links and relationships between the different units. The centrality of a unit in this network increases knowledge sharing and access to knowledge in other areas, which can lead to more innovations and improved performance.

Lundh-Snis and Sorensen (2001) describe two perspectives on knowledge management. One is a cognitive model where knowledge is captured and codified from individuals, transferred through IT and accessed and used by other individuals in new contexts. The second is a community model where knowledge is socially constructed through interaction within communities of practice. A couple of years later, Bresnen *et al.* (2003) provided a similar view without drawing a clear divide between the models. They describe how knowledge management approaches can be characterised in terms of a continuum ranging from 'cognitive' to 'community' models. Cognitive models relate to codification of knowledge and its retention and circulation through information technology. Community models relate to tacit knowledge and its 'embeddedness' within social groups.

Bresnen *et al.* (2003) describe how Intranets and knowledge databases established to capture knowledge in one organisation were not being utilised or kept up to date by staff. As an alternative strategy, a group of 20 regional engineering managers was established to conduct knowledge management functions in the organisation. After a period of establishment they become thought of as the 'corporate memory' of the organisation. This study found that social networks and face to face knowledge transfer were more effective means of managing knowledge than through knowledge systems.

Transfer Methods

Huber (2001) argues that in addition to codified forms of knowledge described in *Knowledge Codification* above, person to person communication should be considered a form of explicit knowledge. Literature concerning knowledge transfer methods tends to focus on knowledge in this more transient form.

Goh (2002) describes how knowledge transfer is a key dimension of the learning organisation and how two successful organisations (Hewlett-Packard and 3M) encourage staff to share and transfer knowledge between each other. Employees in these organisations are rewarded when the knowledge they share is used by another employee or a team to improve a product or a work process. Goh argues that electronic systems for knowledge transfer can only work if they are accompanied with staff motivation and a willingness to share information. A key cultural dimension for effective knowledge transfer in an organisation is 'Cooperation and Collaboration', that is, a natural tendency to share and work with each other. Goh believes that an environment of trust is one of the things required for a high level of cooperation. Trust can be fostered by open and accountable decision making processes, information being widely available and accessible, fair and equitable treatment of employees and rewards that emphasise shared success.

Another key cultural dimension for effective knowledge transfer in an organisation, according to Goh (2002, p.26), is "*problem seeking and*

problem solving”, or an experimenting and innovating culture. Cross functional teams facilitate horizontal communication and knowledge transfer and help to breakdown silo mentalities, but providing structure for knowledge transfer can only work if employees are given the time to use them. Goh believes that different types of knowledge require different transfer mechanisms. Tacit knowledge is more suited to informal, interpersonal means and explicit knowledge is more suited to formal, structured methods.

The closer two parties are the easier it is to transfer knowledge, according to Cummings and Teng (2003). ‘Closeness’ refers to physical distance, a difference in the knowledge base of the two parties and difference in values and culture. The two parties’ view of the importance or priority of the transfer will also affect the ability to successfully transfer knowledge. They describe knowledge transfer as having two dimensions. The first is ‘knowledge velocity’ or the speed of transfer and the second is ‘knowledge viscosity’ or the richness or depth of the knowledge transferred.

Embeddedness

A characteristic of knowledge is its ‘embeddedness’. Cummings and Teng (2003, p.43-44) explain how knowledge can be embedded in; (1) people and their skills, (2) technical tools, (3) routines and systems, and (4) the networks formed between these elements. To successfully transfer knowledge from one party to another, all the components that the knowledge is embedded in must be transferred. As the ‘embeddedness’ of the knowledge increases, the ease of transfer decreases. They believe that individuals know more than they can explain. People possess tacit knowledge that is non-verbalised, intuitive and unarticulated. They write that tacit knowledge is difficult for individuals to articulate as it is *“deeply rooted in action, involvement and commitment within a specific context”*. (2003, p.44)

Absorptive Capacity

While Cummings and Teng’s concept of ‘embeddness’ relates to the party that holds knowledge, Tsai (2001) is concerned with the characteristics of the

receiver. Tsai argues that for a unit to successfully utilise knowledge created in another unit, they must have an ability to 'absorb' the knowledge. A unit's absorptive capacity is increased if the knowledge is building on existing knowledge. Greater absorptive capacity of the receiver results in improved transfer and thus performance.

Goh (2002) provided a similar perspective when he described how the characteristics of the knowledge recipient also have bearing on the effectiveness of the knowledge transfer process. Goh believes that the individual's motivation and absorptive and retentive capacities will all affect the ability to effectively transfer the knowledge. Brady and Marshall (2001) also argue that the success of knowledge codification strategies is limited due to the cognitive limits on articulating and assimilating (or absorbing) knowledge.

Why Do People Share?

Huber (2001) provides five possibilities for why people share knowledge; (1) the need for recognition, (2) the need to serve, (3) the need for equity, (4) the need to adhere to organisational norms, and (5) the potential intrinsic satisfaction associated with filling some of these needs. Huber also believes that tangible rewards (extrinsic motivation) undermine intrinsic motivation for interesting tasks. If management wants the sharing and transfer of knowledge to be a common practice in the organisation, Huber recommends that they need to:

- Ensure that there are no policies or features of reward systems that discourage it;
- Articulate management's expectation that it is the right thing to do;
- Set an example by doing it and encouraging other influential people to do so;
- Publicise benefits that the organisation has experienced from doing it;
- Celebrate instances where the practice occurs; and
- Privately encourage those that fail to share.

Brady and Marshall (2001) argue that power and organisational politics play a significant role in the sharing of knowledge. They also state that to ensure that lessons learnt from previous projects were implemented in future projects it was necessary to make the implementation of these improvements an expected outcome of the project. That is, it was made an integrated part of the project management process, rather than as an add-on.

Although the area of knowledge transfer emerged out of deficiencies with knowledge codification processes, it appears from a review of the literature that many of the same problems remain. The issues of 'embeddeness' of knowledge, the absorptive capacity of the knowledge receiver, and the fundamental questions of why people choose to share knowledge are all equally applicable in the context of knowledge codification. Simply changing the method of capturing knowledge does not resolve the underlying difficulties that hamper knowledge management activities.

Knowledge Systems

In today's technological world, it is not surprising that some literature focuses on how IT systems can support the transfer and capture of knowledge. IT systems help us to store and communicate information, but can they be designed in such a way as to assist with the capture of knowledge in an organisation? Some technologies help people to store and access codified knowledge (such as in a knowledge database) while others aid the transfer of knowledge through people to people communication (such as through e-mail and groupware systems). A number of authors believe that appropriate IT systems can play a useful role in the knowledge capture process, but this can only work if people are skilled, motivated and willing to use them. Sound system design and human quality control are discussed in the literature as ways of ensuring that knowledge management benefits can be obtained by utilising IT systems.

Role of IT in Knowledge Capture

The literature concerning knowledge codification often refers to the use of IT systems for the storage, classification and retrieval of codified knowledge. More recent literature concerning knowledge transfer describes how IT systems can be used to facilitate interpersonal communication for the direct transfer of knowledge between individual people. The role of IT in this process of making tacit knowledge explicit, whether it is for storing codified knowledge in a database or for the communication of knowledge between individuals, is often glossed over in the literature. Lundh-Snis and Sorensen (2001) believe that technology is a tool that supports and facilitates the codification of knowledge, but that the process of codification is a human one. Milton *et al.* (1999), describe how information technology provides ways of storing and communicating information rather than being concerned with the ways that people create, acquire, use and develop knowledge. These distinctions between human behaviours and IT systems are helpful in this context.

Regardless of the challenges involved in making tacit knowledge explicit, organisations still have a need to codify knowledge. IT systems can facilitate both knowledge codification *and* interpersonal communication. These two uses of IT systems are complementary but some of the literature seems to imply that they are at odds or that one is somehow more desirable than the other. This may partially be because the term knowledge is not well defined or understood and much of the literature shows a preference for the term information. This debate is counterproductive and undermines the very real need to codify and capture knowledge in organisations.

Designing Knowledge Systems

Milton *et al.* (1999) believe that knowledge systems should encompass a wide range of methods and should be usable by relative novices. They explain how the codification process needs to consider the needs of the ultimate user, or in some cases, multiple users. Multiple views should be provided to suit different users and different needs. They also describe how codified knowledge needs a logical structure for ease of navigation and a

clear, consistent layout for effective knowledge transfer to the reader. Davenport and Philip (1998) provide a similar view in arguing that the structure of the knowledge base is very important if you want people to be able to access it quickly, especially if the knowledge base is large. Hollman (2002) generally agrees that items in the knowledge base need to be accessible to everyone. Hollman believes however that some items need to be restricted as they require some level of existing knowledge to use it correctly, or the knowledge is of a confidential nature.

Davenport and Philip (1998) argue that customer support knowledge has unique attributes that make its management different from other types or forms of knowledge. Attributes such as the variety of sources and applications and rate of change are relevant. They describe how consistent knowledge representation formats are being developed to assist with sharing of knowledge bases across organisations. The standard looks at breaking up the knowledge into components using knowledge component analysis. They consider that the use of basic document repository and search technology is inadequate for accessing customer support knowledge as it is too slow to access and answer customer questions on the front line. Other technologies they believe are more suited to this type of knowledge are (1) rule based expert systems, (2) probability networks, (3) rule induction, (4) decision trees and (5) case-based reasoning.

Quality Control

The use of human editors, synthesisers and quality checkers to ensure the quality of knowledge being stored in a knowledge base, is very important according to Davenport and Philip (1998). Hollman (2002) agrees, and describes how the quality of knowledge being put into the knowledge base should be controlled by a small group of people. The role of these people is to review new items of knowledge and decide which are the most valuable. Items of knowledge in the knowledge base that aren't used frequently or are aren't considered useful by users should also be reviewed by this group and removed if necessary. Hollman also advocates the use of a 'knowledge

management coach' to help people to codify their knowledge to ensure the completeness of the knowledge captured.

Benefits of Knowledge Systems

Milton *et al.* (1999) believe that knowledge systems have the most promise in the area of knowledge codification processes. They found that with careful training and coaching, novices can become competent practitioners in knowledge acquisition and modelling within a relatively short period of time. Hollman (2002) describes how an organisation's knowledge base can be used to help staff answer customer enquires or can be used by customers themselves to answer their own enquires. Davenport and Philip (1998) agree, stating that measurable benefits have been demonstrated in a number of support organisations such as reduced call times, reduced call volumes, less use of expensive field staff or experts and the number of issues resolved on the first call.

While most authors agree that knowledge systems are merely a tool to assist with knowledge capture initiatives, they can provide a number of benefits to organisations. These benefits can only be achieved however if the role of IT is kept in perspective and the systems are designed appropriately. It is also essential to establish human-based, quality control processes for any knowledge system, to address the limitations of these technologies.

CHAPTER THREE: BACKGROUND

To assist with the interpretation of the results of this study, it is worthwhile considering some relevant background information. As this research project was conducted in a single organisation, a brief organisational history and description is provided in this chapter. This study was conducted within the context of the organisation’s “Corporate Knowledge Program”, and so a description of the objectives and structure of this program is also presented.

Population Study Organisation: City of Perth

The City of Perth (the City) is the capital city local government of Perth, Western Australia. Local government sits at the third tier of government in the Australian political system under the State and Federal levels. This is sometimes referred to as the ‘grass roots’ level of government as it has the greatest impact upon a particular local area and its residents. The functions and activities of Australian local government, as described in the *Keyword for Councils Thesaurus*, are broadly described as follows:

<i>Function</i>	<i>Brief Description</i>
Commercial Activities	The function of competing commercially or providing services to other local governments or agencies on a fee for service basis. Includes undertaking activities on a consultancy or contract basis.
Community Relations	The function of establishing rapport with the community and raising and advancing the Council’s public image and its relationships with outside bodies, including the media and the public.
Community Services	The function of providing, operating or contracting services to assist local residents and the community.
Corporate Management	The function of applying broad systematic planning to define the corporate mission and determine methods of the City’s operation.
Council Properties	The function of acquiring, constructing, designing, developing, disposing and maintaining facilities and premises owned, leased or otherwise occupied by the City.
Customer Service	The function of planning, monitoring and evaluating services provided to customers by the council.
Development & Building Controls	The function of regulating and approving building and development applications for specific properties, buildings, fences, signs, antennae, etc. covered by the Building Code of Australia and the Environment Protection Authority (EPA).
Economic Development	The function of improving the local economy through encouragement of industry, employment, tourism, regional development and trade.
Emergency Services	The function of preventing loss and minimising threats to life, property and the natural environment, from fire and other emergency situations.
Energy Supply & Telecommunications	The function of providing infrastructure services, such as electricity, gas, telecommunications, and alternative energy sources.

Function	Brief Description
Environmental Management	The function of managing, conserving and planning of air, soil and water qualities, and environmentally sensitive areas such as remnant bushlands and threatened species.
Financial Management	The function of managing the City's financial resources.
Governance	The function of managing the election of Council representatives, the boundaries of the City, and the terms and conditions for Elected Members.
Government Relations	The function of managing the relationship between the Council and other governments, particularly on issues which are not related to normal Council business such as Land Use and Planning or Environment Management.
Grants & Subsidies	The function of managing financial payments to the City from the State and Federal Governments and other agencies for specific purposes.
Information Management	The function of managing the City's information resources, including the storage, retrieval, archives, processing and communications of all information in any format.
Information Technology	The function of acquiring and managing communications and information technology and databases to support the business operations of the City.
Land Use & Planning	The function of establishing a medium to long term policy framework for the management of the natural and built environments.
Laws & Enforcement	The function of regulating, notifying, prosecuting, and applying penalties in relation to the Council's regulatory role.
Legal Services	The function of providing legal services to the City.
Parks & Reserves	The function of acquiring, managing, designing and constructing parks and reserves, either owned or controlled and managed by Council.
Personnel	The function of managing the conditions of employment and administration of personnel at the City including consultants and volunteers.
Plant, Equipment & Stores	The function of managing the purchase, hire or leasing of all plant and vehicles, and other equipment. Includes the management of the City's stores. Does not include the acquisition of information technology and telecommunications.
Public Health	The function of managing, monitoring and regulating activities to protect and improve public health under the terms of the Public Health Act, health codes, standards and regulations.
Rates & Valuations	The function of managing, regulating, setting and collecting income through the valuation of rateable land and other charges.
Recreation & Cultural Services	The function of the City arranging, promoting or encouraging programs and events in visual arts, craft, music, performing arts, sports and recreation, cultural activities and services.
Risk Management	The function of managing and reducing the risk of loss of City properties and equipment and risks to personnel.
Roads	The provision of road construction and maintenance of rural roads and associated street services to property owners within the City area.
Sewerage & Drainage	The function of designing and constructing, maintaining and managing the liquid waste system, including drainage, sewerage collection and treatment, stormwater and flood mitigation works.
Traffic & Transport	The function of planning for transport infrastructure and the efficient movement and parking of traffic. Encompasses all service/facilities above the road surface and includes all forms of public transport.
Waste Management	The function of providing services by the City to ratepayers for the removal of solid waste, destruction and waste reduction.
Water Supply	The function of managing the design, construction, maintenance and management of water supplies, either by the City or by service providers.

Table 1: Local Government Functions

(State Records Authority of NSW, 2001)

The City of Perth has a long history by Australian standards. The organisation was established in 1838 as the Perth Town Trust, nine years after the Swan River Colony was established by the British. The town became a city in 1856 when Queen Victoria declared Perth a 'Bishop's See' and two years later the Trust formally changed its name to the Perth City Council. The boundaries of the City were quite extensive and widened further in 1914 and 1917 when smaller local governments on its boundaries were amalgamated with the City. In 1993 the State Government massively reduced the City's boundaries when it split the City of Perth into four separate local governments (City of Perth, 2006).

The geographic area the City now governs is only 8.75 square kilometres, and includes the Perth Central Business District and four immediate inner city suburbs. The City's residential population was estimated at 11,821 by the Australian Bureau of Statistics in June 2005. The City also has an estimated day time visitation of 100,000 people (City of Perth, 2006).

The City of Perth is governed by a council of nine members that are democratically elected by residents and ratepayers located within the City's boundaries. The Council is comprised of eight councillors and a Lord Mayor. A Chief Executive Officer reports to the Council and is responsible for the operation of the City. The organisation employs 469 permanent, full time equivalent staff and is structured into four directorates as shown in the following chart. This structure groups staff with common functions rather than the more traditional, profession-based structure (City of Perth, 2006).

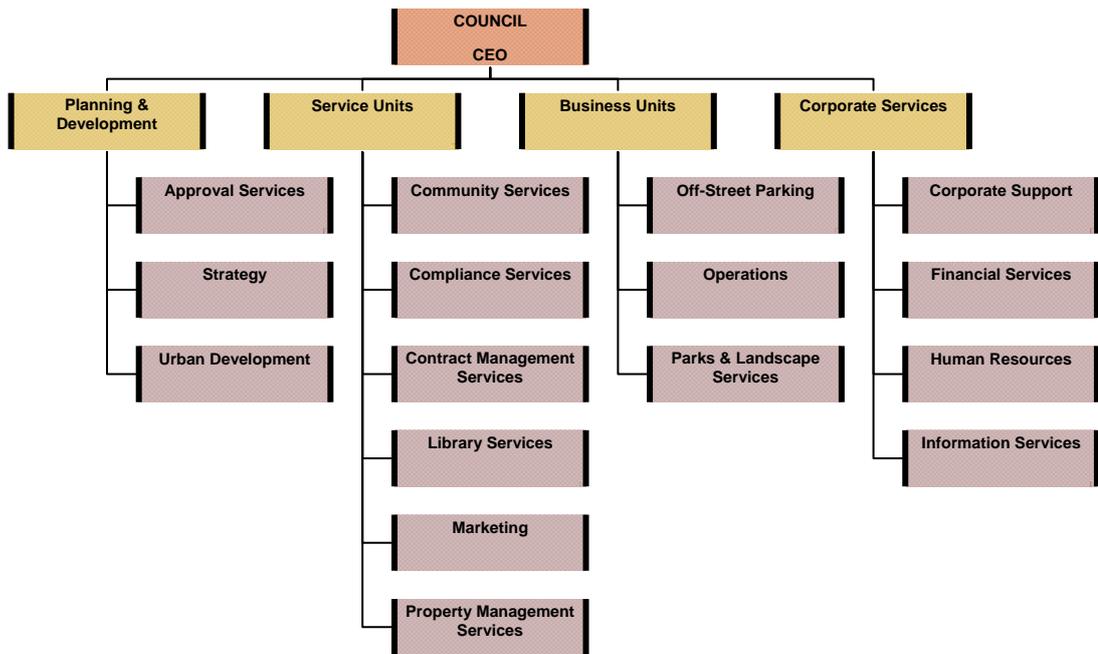


Figure 3: City of Perth Organisational Chart

The staff of the City operate from a number of different work locations. The majority of staff operate out of 'Council House', an eleven-storey office building located on St Georges Terrace, the main business street in the Perth central business district. The City also operates a works depot in Balcatta, a northern suburb outside the City's boundaries a short drive from the City. In addition to these two main sites the City also has staff located in a library, child care centre, community centre, rest centres, CCTV surveillance post and a number of car parks and gardens around the city.

The City's vision statement, as articulated in its Strategic Plan, is: *"That as the capital of Western Australia, the City of Perth be widely acclaimed as a city of regional and international significance."* The City's strategic objectives are:

- *"To provide vision and leadership in all our activities.*
- *To provide a safe accessible, comfortable and aesthetically pleasant city.*
- *To operate in a financially prudent and ethical manner.*
- *To ensure that services are delivered by best practice standards.*
- *To deliver a high level of service in a friendly and courteous manner.*

- *To ensure our staff work in a safe and fulfilling environment and that they are properly compensated for their contribution.”*

(City of Perth, 2004)

The City’s Strategic Plan also sets out seven key result areas for the organisation to achieve in the period 2004-2008. These seven key result areas are summarised below:

- **“1) City Leadership:** *The City of Perth, as the capital city of Western Australia, displays leadership and clarity of direction for the community with open and accountable government.*
- **2) Prosperous City:** *A diverse, prosperous and resilient capital city economy that is sustainable over the long term. As the capital city of Western Australia, Perth is to be the destination of first choice.*
- **3) Liveable City:** *A welcoming and liveable city that balances social, environmental and economic needs. A vibrant and engaging city well known for its distinctive and unique qualities.*
- **4) Accessible City:** *A place that people can easily get to and move around in and access information readily.*
- **5) Attractive and Functional City:** *A functional and attractive city that all sections of the community use, participate in and enjoy. City development optimises the balance between social, environmental and economic objectives.*
- **6) Environmentally Responsible City:** *A city with high quality water, air and land that uses resources responsibly.*
- **7) Capable and Responsive Organisation:** *The organisation has the capability to understand and respond to community expectations and has the internal capability to achieve the City’s objectives.”*

(City of Perth, 2004)

Study Context: Corporate Knowledge Program

In 1999 the City of Perth Process Improvement Taskforce was formed as a result of recommendations from an external assessment of the organisation under the Australian Business Excellence Framework (SAI Global Limited, 2007). The taskforce was established to facilitate the review and improvement of key organisational processes. Later that year the taskforce identified the following issues with the management and use of information and knowledge across the organisation:

- *“Staff leaving the City, resulting in a loss of valuable knowledge and expertise*
- *No formal procedures have been established for many of the City’s processes*
- *Current processes have not been adequately documented*
- *Knowledge of significant historical events and precedents is often limited to individual key staff (this is lost when staff leave)*
- *There is limited awareness and use of information sources available and how to obtain information from those sources*
- *The rapport and relationships with the community are often unique in significant areas and currently these relationships cease to exist when staff leave*
- *Significant problems hamper current information management systems, resulting in a lack of centralised resources for corporate information*
- *Existing centralised facilities for information capture, control and retrieval (eg. Lotus Notes, Record Keeping System, Corporate Library) are underutilised by staff*
- *There is much duplication of information throughout the City*
- *There are a number of instances of poor communication and documentation patterns at the City (eg. use of file notes, staff meetings and briefings and staff hand-overs)*
- *There is a need for increased managerial responsibility for information management”*

(City of Perth, 2000)

In June 2000 the taskforce established a Corporate Knowledge Program to tackle the knowledge management issues described above. The objective of the program was to develop processes for capturing, managing and utilising knowledge. The City's knowledge management vision was to *“operate a simple and effective process for managing corporate knowledge and operate in an environment that is conducive to the capture, sharing and management of quality knowledge”*. The specific objectives of this program were to:

- *“Provide systems and processes to give staff the tools to manage their knowledge*
- *Understand the information needs of the City*
- *Understand the information politics within the City*
- *Effectively identify key knowledge assets and sources*
- *Ensure corporate knowledge is not lost when employees leave the City*
- *Preserve corporate knowledge into the future*
- *Encourage the efficient and effective use of corporate knowledge*
- *Encourage the capture of quality knowledge*
- *Ensure the City's knowledge base is easy to access and contribute to*
- *Foster a knowledge sharing culture”*

(City of Perth, 2000, p.3)

The Corporate Knowledge Program was a coordinated set of individual knowledge management initiatives at the City of Perth. The focus of the Corporate Knowledge Program was twofold. The program developed processes to manage knowledge (Stream A) and established an environment to that encouraged people to share, retain and manage knowledge (Stream B). These streams had a distinctly different focus. Stream A established knowledge management *processes* while Stream B developed the *environment* they operate in. These streams ran in parallel throughout the program and were dealt with as separate components to ensure they both received the appropriate attention. (City of Perth, 2000)

The program was executed over a number of phases. This stepped approach aimed to ease the City into a culture of managing organisational knowledge,

by starting with basic initiatives and then progressing to more complex and ambitious knowledge management endeavors. The program's five phases are shown in the following diagram.

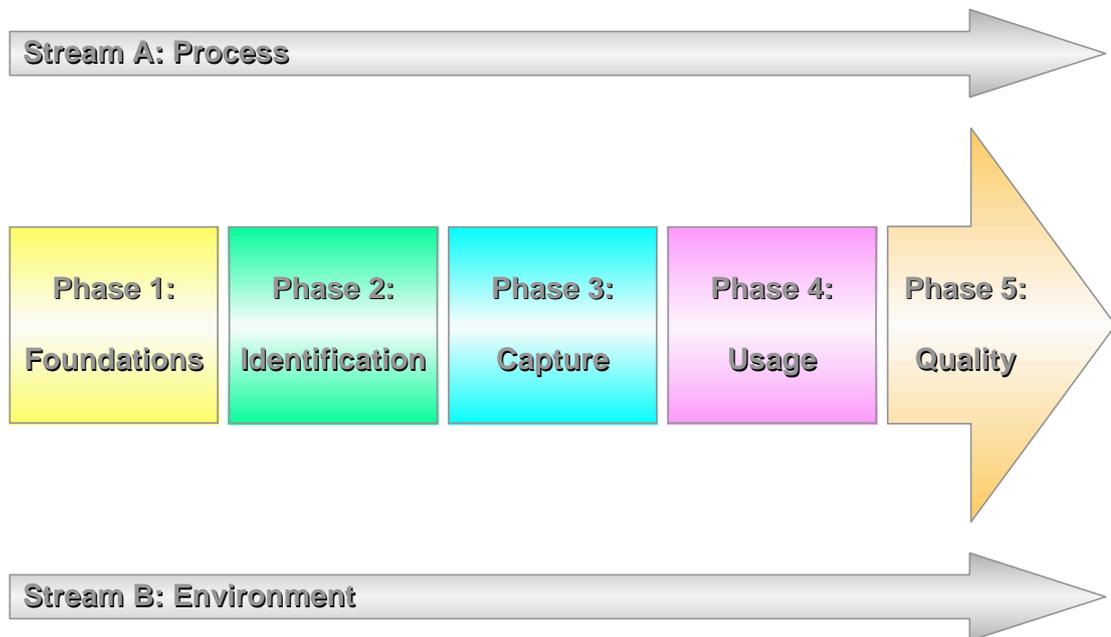


Figure 4: Corporate Knowledge Program Phases & Streams

Phase 1: Foundations

This first phase set a foundation for knowledge management at the City. It focused on providing sound processes for managing City information, as well as educating staff on the value of information as an organisational resource. At the completion of this phase, the systems and practices supporting information management in the City were given a boost in profile and there was a better understanding among staff about what information management is, its value to the City and the types of information the City creates, collects, uses and maintains.

Phase 2: Identification

Phase two was to provide staff with the skills to identify and characterise the major sources of knowledge at the City, as well as identify sources of knowledge within their day-to-day work. At the completion of this phase, staff would have an improved understanding of the knowledge they utilise at the City and the sources of that knowledge. This phase would mark the

beginning of an increased awareness of the importance of managing the City's knowledge.

Phase 3: Capture

Phase three was to focus on developing methods to capture the knowledge identified in phase two as well as developing an environment which encourages and supports the capture of knowledge. At the completion of this phase, staff would appreciate the need to capture knowledge and would have the processes, tools and skills available to make it happen.

Phase 4: Usage

Once the City is actively capturing its knowledge, phase four was to concentrate on encouraging staff to use this knowledge to improve their work efficiency and the quality of their outputs. At the completion of this phase, staff would be confident in utilising knowledge to assist with their day-to-day activities and would do so with the aim of improving the delivery of services to the City.

Phase 5: Quality

Once the City is effectively utilising the knowledge they have been capturing, phase five was to help ensure that the knowledge being captured is of a sufficiently high quality. At the completion of this phase, staff would be aware that the quality of the knowledge they capture will significantly affect the value of that knowledge when they come to use it. It would also provide quality assurance processes to ensure that captured knowledge met appropriate standards. (City of Perth, 2000)

While this research project is quite independent of the City's Corporate Knowledge Program, it provides a valuable input into the City's program. This study considers a number of critical issues that need to be addressed during the identification and capture phases of the Corporate Knowledge Program, in both the process and environment streams.

CHAPTER FOUR: METHODOLOGY

A research methodology involving structured interviews with a sample of staff of a single organisation was utilised for this study as described in Chapter One: Introduction. This chapter provides a description of the research methodology used during the study. This includes ethical considerations, how a representative sample of participants from the organisation was selected and how the structured interviews were conducted. The data collection and analysis methods used by the researcher are also discussed.

Ethical Control

As it was possible that some staff participating in the study would be in dependent or unequal relationships with the researcher, human research ethics approval was sought prior to the commencement of the study. Approval was granted by the University's Human Research Ethics Committee (approval number HR 176/2003) subject to the process described in *Appendix A* being followed. The responses of participants have been kept confidential and individuals have not been personally identified in any published results. Data collected by this study is stored securely at Curtin University of Technology and will not be made available to the City of Perth except as quoted in this thesis.

Sample Selection

An electronic report detailing some key demographic details of staff employed by the organisation was obtained by the researcher through the Manager of Human Resources. This report included the name, position title, organisational unit, gender, years of service, position classification code, and age group of all current employees. This report was then analysed to produce an overall demographic profile of the organisation, based on the following characteristics of staff:

- Gender
- Age
- Level of Position

- Years of Service
- Professional Background

The gender of staff was very straightforward, either male or female. The four other characteristics however, required some level of interpretation and analysis to produce a meaningful demographic profile of the organisation. To protect staff privacy, the report did not provide the date of birth of staff but rather an age group. The breakdown of staff by age was therefore predetermined for this study. The groups used in the report were 15-24, 25-34, 35-44, 45-54, 55-64 and 65-74 years of age.

The City employs staff in a very wide range of positions, and utilises a number of different individual and enterprise employment agreements. As a result, over 80 different position classification codes were included in the report. Many of these codes were duplicates due to data inconsistencies or were similar levels with slightly different employment conditions. These codes were analysed and grouped into just 12 position levels. This was done by first grouping together obvious duplicates (such as “band3” and “lv13”) and very similar codes (such as “band5” with “band5sfl”, self funded leave). Position classification codes established under different enterprise bargaining agreements (such as CCTV and childcare) were merged by comparing salary scales attached to the different agreements. The final 12 levels that were used in the demographic profile were 1 to 9, Manager, Director and CEO.

The number of years of service for each staff member was included in the report provided by the City. The years of service ranged from 0.01 to 40.58 years. An analysis of the spread of data points within this range showed that 49% of staff fell between 0.01 and 5.00 and only 9% fell between 21.00 and 40.58. To provide a meaningful analysis of this demographic characteristic, years of service were placed into six groups. These groups were 0-1, 2-5, 6-10, 11-15, 16-20 and 21+. These groupings recognise that the experiences and attitudes of staff tend to change more in the early years of their employment than during the later years.

The fifth and final element of the demographic profile related to the professional backgrounds of staff. A previous staff awareness initiative of the organisation's knowledge management program (as detailed in Chapter Three: Study Context) analysed the types of staff employed by the organisation along the lines of their professional focus. This initiative grouped the organisation's staff into one of five professional groups. These groups were considered appropriate for this study and were used to classify the position titles provided in the report. The five professional groups were customer service, administrative, technical, creative and strategic.

A sixth characteristic of staff, being their level of education, was also considered by the researcher. Unfortunately this type of data was not held in the City's Human Resource Information System. While this data could have been collected easily enough from the sample, it would not have been possible to compare this characteristic of the sample to the overall demographics of the organisation, to ensure it was representative.

A group of 29 staff were selected from the report to be invited to participate in the study. This equates to a sample size of 5.8%. A representative sample was selected by ensuring that the demographics of the sample matched as closely as possible to the organisation's demographic profile described above. Graphs showing the five demographic characteristics of both the sample and the whole organisation are provided below for comparison.

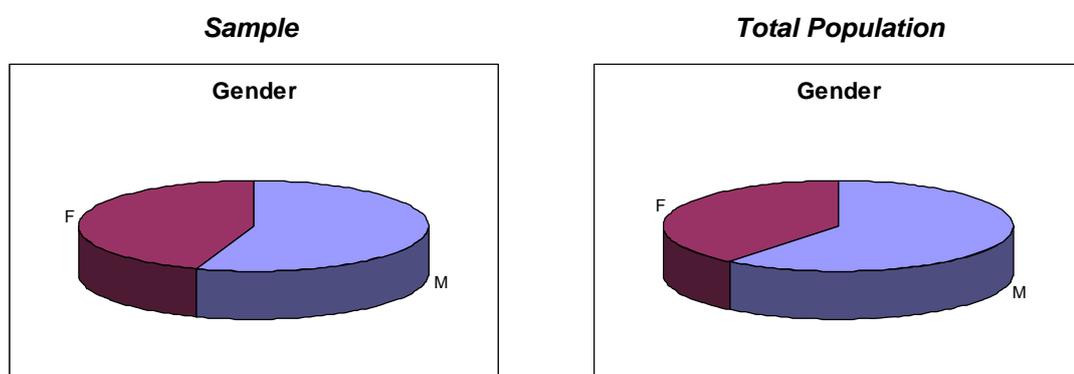


Figure 5: Sample Gender Comparison

The sample had a slightly higher proportion of females than the total population (45% compared to 39%). This however provided a better gender balance for the sample.

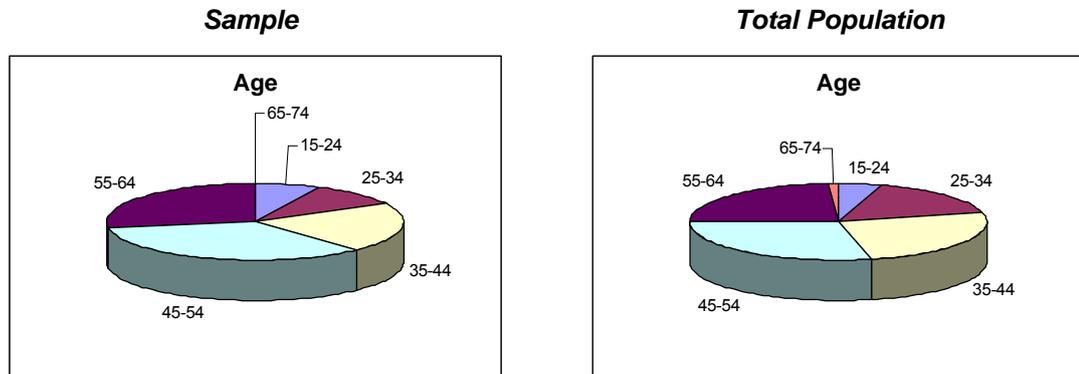


Figure 6: Sample Age Comparison

The age group 65-74 years were not represented in the sample; however this group only made up 1% of the total population. The other age groups for the sample were either slightly more or less than the total population. The sample was slightly skewed towards older staff due to the greater level of experience they could share with the researcher.

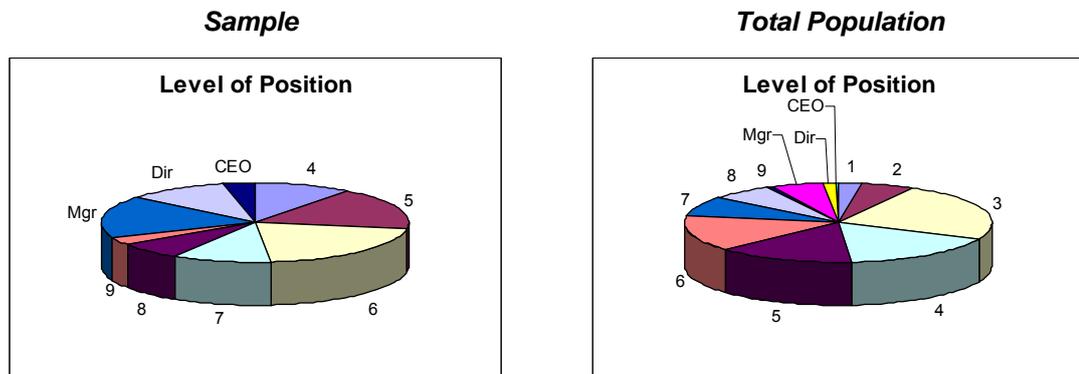


Figure 7: Sample Position Level Comparison

The position level of staff in the sample was skewed towards the higher level positions due to the need to include high level staff from all areas of the organisation. Level one, two and three positions were not included in the study due to the limited experiences they have with information and knowledge based activities in the workplace.

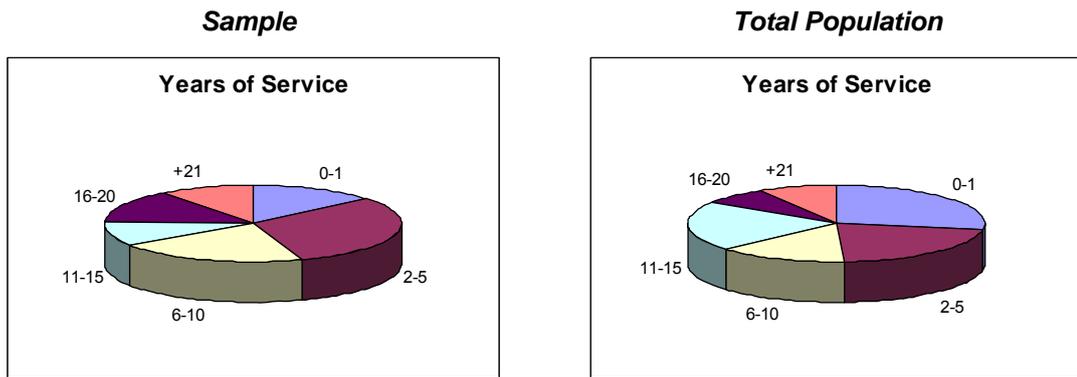


Figure 8: Sample Years of Service Comparison

The sample was slightly skewed towards staff that had worked in the organisation for a longer period of time. This was because these people have a greater level of experience with information and knowledge based activities in the organisation.

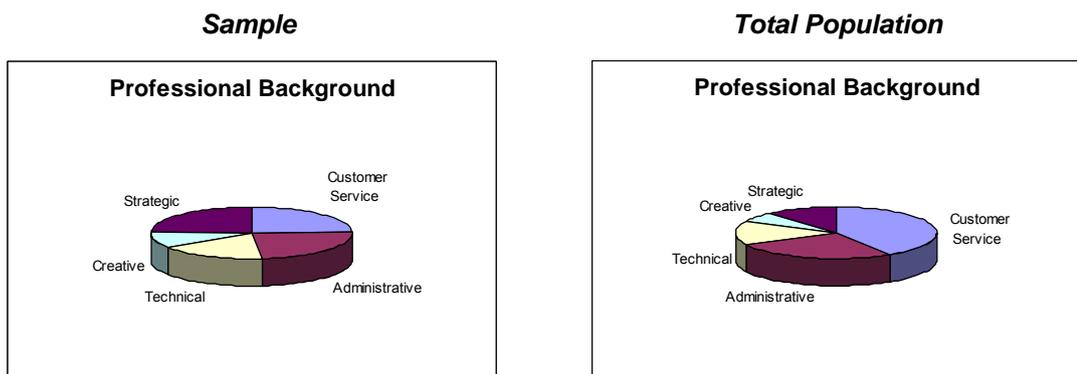


Figure 9: Sample Professional Background Comparison

The sample had a good mix of staff from different professional backgrounds, but had a partially different ratio to the total population. The sample had a higher proportion of strategic staff than the total population (24% compared to 12%) and a lower proportion of customer service staff (24% compared to 41%). This was due to a desire to include in the study a mix of staff from a wide range of positions and from different areas of the organisation's structure.

Structured Interviews

Over a period of four months, structured interviews were conducted by the researcher with each of the 29 staff in the sample. The one-on-one interviews were approximately one hour in duration and took place in the offices of the organisation. A standard introduction was read out by the researcher at the start of each interview to ensure all participants were provided with the same background and context to the study. This reiterated the purpose of the study and the format of the interview and provided an introductory narrative, as detailed in *Appendix B*.

Following the introduction, all participants were asked the same set of eight questions. The same or similar prompts were also used with all participants where ever possible. These questions and prompts are discussed in the data collection section below.

Data Collection

Data for this study was collected exclusively through the structured interviews described above. Data was collected by asking participants the eight open questions listed in *Appendix B*. If necessary, the prompts detailed under each question were used to obtain more information from the participant. Questions one and two were sometimes repeated with participants to obtain data on different types of work related tasks.

The researcher performed the role of interviewer and so only took rudimentary notes during the interviews. Some further comments were noted by the researcher immediately after each interview had concluded. These interview notes included general comments and observations regarding the interview process and some of the major points raised by the participant. These notes totalled approximately 10,500 words for all the interviews and provided a useful resource for the researcher during the data analysis stage.

All the structured interviews were taped using an analogue voice recorder. Verbatim transcripts were created in digital format for each interview recording. These transcripts provided the key data for analysis as described

in the Data Analysis section below. The digital transcripts were 132,547 words in total, with an average of 4,570 words per interview.

Data Analysis

The digital interview transcripts generated during the data collection process described above were analysed by the researcher using qualitative data analysis software. The software utilised for this study was “N6” produced by QSR International Pty Ltd. The transcripts were converted to plain text format and then imported into the software for analysis. The interview transcripts were reviewed by the researcher and relevant response nodes were created in the software. At the same time, text in the transcripts was linked to corresponding response nodes. Each interview transcript was also linked to the participant’s demographic profile to allow a demographic analysis of the responses. A total of 226 response nodes were created in the software once all 29 transcripts had been analysed by the researcher. A series of node searches were then conducted to obtain the raw data required for analysis. For further details of this data analysis process, refer to *Appendix C*.

The raw data obtained from each node search was then exported from “N6” and imported into a Microsoft Excel spreadsheet. The total number of participants in each demographic group was manually entered into the spreadsheet. Formulas were then used to automatically calculate the percentage of participants in each demographic group that provided a particular response. An image of a section of the spreadsheet is provided below to illustrate. A total of 1,781 points of data were analysed in the spreadsheet.

Structured Interviews - Analysis													
32	Age	321	322	323	324	325		321	322	323	324	325	
21	Knowledge Types	15-24	25-34	35-44	45-54	55-64	TOTAL	15-24	25-34	35-44	45-54	55-64	TOTAL
	Sample Total	2	3	6	10	8	29	2	3	6	10	8	29
211	Procedural	2	1	5	9	6	23	100%	33%	83%	90%	75%	79%
212	Precedential	1	1	2	2	0	6	50%	33%	33%	20%	0%	21%
213	Environmental	1	2	2	5	3	13	50%	67%	33%	50%	38%	45%
214	Historical	0	0	2	5	5	12	0%	0%	33%	50%	63%	41%
215	Asset	0	1	1	1	5	8	0%	33%	17%	10%	63%	28%
216	Political	0	0	1	2	1	4	0%	0%	17%	20%	13%	14%
217	Relational	1	2	4	5	6	18	50%	67%	67%	50%	75%	62%
218	Functional	1	0	5	5	3	14	50%	0%	83%	50%	38%	48%

Figure 10: Example Structured Interviews Analysis Matrix

The percentages in each of the resulting 38 matrixes were then analysed by the researcher. The percentages were reviewed along both the horizontal and vertical axes to identify any significant patterns in the data. Patterns were recorded and the corresponding response nodes in “N6” were browsed to identify applicable sections of the interview transcripts. Relevant quotes from participants were then reviewed to explore and verify the observations made from the data. These observations, pertinent examples and supporting quotes from the interviews are presented in Chapter Five: Results, which follows.

CHAPTER FIVE: RESULTS

The application of the research methodology detailed in Chapter Four produced a rich set of results. Some of the results were expected and are generally supported by the literature. Other results were more surprising leading to some interesting findings regarding methods for capturing corporate knowledge in an Australian local government. This chapter presents these results grouped into the following eight topics:

- Knowledge Types
- Knowledge Sources
- Knowledge Capture Processes
- Motivation for Knowledge Capture
- Extent of Knowledge Sharing
- Barriers to Knowledge Sharing
- Information Management Processes Utilised
- Knowledge Capture Purpose

Knowledge Types

During the structured interviews study participants were asked to pick a task that they regularly perform in their position and then describe the corporate knowledge they need to successfully complete that task. In other words, “What do you need to know to be able to do what you do?” The corporate knowledge that was identified and described by participants can be grouped into the following eight broad types:

- Asset
- Relational
- Environmental
- Functional
- Historical
- Political
- Precedential
- Procedural

Asset knowledge can be described as knowledge regarding the type, location, availability, condition and other features of the organisation's physical assets. A basic example of this type of corporate knowledge was provided by an officer working in the organisation's Area Maintenance unit, who stated "... you know where various things are, like where garden beds are, where tap points are...". The location of a tap in a particular park may seem like a trivial piece of knowledge, but to a gardener that works on a three week rotation between different areas of the city, knowing where all the taps are so that you can quickly access them is an important item of corporate knowledge.

Another more detailed example of asset knowledge was provided by an Arbour-culturist, who stated:

"As an illustration I met [another officer] down at Barrack Square yesterday because we were looking at another large project in putting some big palms in the ground where we need to excavate a hole nearly 3 metres in diameter and near to where one of these palms was going to go [the officer] said to me 'I can remember when they were doing the Bell Tower work there was a big pit near that area', now it would be good if you had a lot more information or even photographic evidence of what that pit was and why it was where it was and so on."

As a significant proportion of a local government's assets are located underground, and so are out of sight, knowledge about subsurface assets such as in the above example was identified by a number of participants.

Relational knowledge includes knowledge of the relevant skills, knowledge, personalities and motivations of individual people an officer has contact with. These contacts may be either internal or external to the organisation. One participant simply described this as "*contacts made over the years*". A team leader that was interviewed described a number of examples of this type of knowledge. When talking about allocating work to members of his team he stated:

“I’ve got five labourers so their knowledge and skill level varies ... some of the guys I know will get in and do a job but others guys maybe just do what they have to ... I’ve got to deal with personality and I’ve got to deal with their work ethic ... it’s just a matter of getting to know all the personalities of these people ... there are some guys I can’t put together because of personalities ... if I put them together and send them off on their own they get talking and the work rate slows down ... and a certain task, if they require a higher horticultural skill level for example, I will put a certain one in that position because I know they will do the job to a high standard as opposed to someone who might not ... so I have to know all those things.”

For a supervisor, understanding the various personalities, skill sets and knowledge of your team members is necessary to ensure work is performed efficiently and to a high standard.

Environmental knowledge concerns the relevant features of the environment in which the organisation operates. A Trade Supervisor described this type of knowledge when he stated:

“For example, the operation for the City of Perth is a unique operation, there is no other Council in Western Australia that operates the same as City of Perth. Maybe in corporate levels they do, but certainly at operational levels they don’t. Because of the fact that we are CBD so we have quite unique operational conditions from other people. Also it’s an unfortunate fact of life that Western Australia in general has completely different operational conditions for machines than most other places in the world.”

For officers undertaking day to day operational activities in the city, knowledge of the natural and built physical environments they work in are fundamental forms of corporate knowledge they require to be able to successfully perform their work.

An executive identified a slightly different form of environmental knowledge needed when developing policies on behalf of the City. He stated that he would need *“knowledge of local government and legislation and of how local government operates and works within its structures...”* This type of environmental knowledge concerns features of the legislative and regulatory environment in which the organisation operates rather than the physical aspects.

Functional knowledge of an organisation includes knowledge of its structure, the functions of particular organisational units, and the roles and responsibilities of positions established in those units. A Community Development Officer explained how knowledge of the organisation’s governance structure and delegations of authority was required when processing a donation request. He stated:

“The first thing that has to happen is an assessment as to whether or not it will go to full Council, whether it will go to Committee or whether it will be dealt with under my delegated authority, and that's just an on the spot choice that relates to the amount of money that is either requested and/or needed to fulfil the particular request.”

In bureaucracies such as local government, having a clear understanding of decision making structures and levels of authority is essential to meet legal and accountability requirements.

A Project Officer responsible for coordinating external events being held in the city identified functional knowledge when she highlighted her need to know what each part of the organisation does. She stated:

“The internal part is that we are looking at anything from Approvals, Compliance, Community Services and other businesses within the unit such as Area Maintenance and Operations. It's very much identifying if we have the facilities and business skills available to support an event. It could be anything from event parking through to having an event in a car park. So there is a process of identification and going to other areas within

each unit to source their knowledge. For instance with Compliance it could be just curb side parking, maybe health regulations and environmental issues and things like that and basically using all of those people to establish whether we can hold the event or not ... I suppose it's largely to understand what they're doing, what we need and a bit of that needs to be communicated out to people. But you have got to work in with what the unit's objectives are and everything like that.”

The functional organisational structure of the City means that a seemingly simple task often requires the coordination of activities from a number of different organisational units. An understanding of what each unit does and their role in the organisation is, therefore, often required by officers working in local governments.

Historical knowledge is focused on historical events that have shaped the organisation’s views on contemporary issues. An executive, talking about the knowledge required to prepare a report for the Council described this type of knowledge when he said:

“Historical [knowledge], where we will look back into the organisation and look at engineering plans or what documentation we might have within the organisation too, so that we don't, well hopefully we learn from what has gone before us firstly, secondly that we don't simply just regurgitate something that may have been addressed some years beforehand.”

Many issues in local government stretch over a long period of time and so some knowledge of the background to these issues can assist with consistent and better informed decision making.

Another executive, this time discussing the preparation of the annual budget, described the importance of historical knowledge.

“That requires knowledge of regulations, but it also requires some memory in terms of what we've done before which is also something we feed into the process, but it's also available to look at as well, there's past budgets and past annual reports and that's to do with capability, what we are

actually capable of doing in a year. That kind of thing. Also what's been approved before and what hasn't so you've got a feel for whether a project is able to fly in the year or only part of it is able to be done so there's a fair bit of having to remember what's happened before and as I say that is all documented but because of my past experience I remember it as well, but it is all there documented."

As with many organisations, some activities, such as budgeting, are highly cyclical in nature and knowledge of previous iterations can be very helpful in informing the current cycle.

Political knowledge concerns the political and cultural environment in which the organisation operates. An executive referred to political knowledge when discussing the Council reporting process when he stated:

"Well there'd be a number of elements, there would be ... political knowledge or political astuteness perhaps, trying to read how a particular report might be seen by the general community and the elected members in particular. Having said that we write our reports in a professional non bias way but one must be cognisant of how the issue sits within the community generally..."

While certainly a more abstract form of corporate knowledge, an understanding of the external political environment and internal politics within an organisation help an officer to gain support for their projects and initiatives.

Another executive also described political knowledge, although in a less direct way when talking about the corporate knowledge he needs to provide advice to Elected Members.

"... it's about having an awareness and understanding of everything that's going on that's likely to be an issue of interest, so how do you decide what's an issue of interest? Generally speaking it requires that directors, managers and then staff below them have an awareness of what elected members are likely to be interested in and that generally comes about by

either experience or by noting the types of questions they ask in general business or the types of historical queries that you have had, that will often relate to the individual area of interest of a particular Councillor.”

Given that the elected members of local government councils are operating in a highly political role, sound knowledge of their individual issues and interests is required to ensure the organisation’s projects and services meet their expectations.

Precedential knowledge includes past decisions that have set precedents for future decision making. This type of knowledge is most often thought of in a legal context, so it is not surprising that a Compliance Officer identified this type of knowledge when discussing prosecutions.

“The corporate knowledge as I see it would be applying our prosecution procedure which is an internal policy on what we do, and what the conditions have to be before we actually proceed to legal action ... it's a procedure with a lot of steps and at each step there can be a review by the person further upwards ... [they may ask] about precedents ... probably not fully documented some of those precedents.”

With an increasing public interest in the activities and decisions of government, knowledge of previous decisions and rulings helps to ensure fairness and consistency in decision making over time.

Procedural knowledge concerns the steps to be followed by one or more officers to execute a particular process or activity of the organisation. A Records Officer provided a clear description of this type of knowledge when she stated:

“Yes, you can't just walk into the office and sit down and do it. You usually have to be shown. There's the thesaurus that you can always refer to, once you've used that a few times you get to pick up the general idea of it and use the right terminology when you are registering documents. Just speaking to other staff that do it because there are six of us that do it everyday, just speaking to them and working out what the correct

procedure is, particularly if it's a new item. But again it just comes down to practice.”

As many activities in local government are process-based, the need for procedural knowledge is common and ensures that processes are performed efficiently, consistently and thoroughly.

The eight types of corporate knowledge described above were ranked by the number of participants that identified them during the structured interviews. The rankings are shown in the following table.

Corporate Knowledge Type	Percentage
Procedural	79%
Relational	62%
Functional	48%
Environmental	45%
Historical	41%
Asset	28%
Precedential	21%
Political	14%

Table 2: Corporate Knowledge Types

The different types of corporate knowledge described above were compared to the demographic profiles of the study participants that identified them. Certain types of knowledge were more frequently identified by some demographic groups than others, providing some predictable and some interesting results which are discussed below.

Some form of procedural knowledge was identified by 79% of participants, the most frequent of any knowledge type. It is not surprising, therefore, that this type of corporate knowledge was identified by every demographic group analysed in the study. This may be because procedural knowledge is seen as a basic type of corporate knowledge that someone requires before they can attempt almost any task or activity in a local government environment. Another reason for the high frequency of identification of this type of

knowledge may be due to a long term drive by the City to formally document its key procedures.

Another frequently identified type of corporate knowledge was “relational”, or knowledge regarding an individual’s contacts and relationships. This type of knowledge was identified by 62% of participants in the study. The length of time an individual has been working for the City seemed to be the main driver behind this type of knowledge. Participants that had been working for the organisation for more than eleven years tended to identify contacts and relationships more than participants that were newer to the organisation. This is not a very surprising result given that contacts and relationships tend to take a number of years to create and develop to a point that they become useful to an individual working in an organisation. This also raises an interesting question that will be explored in the next section regarding knowledge sources. Once people know of an individual they can contact to obtain knowledge on a particular subject, are they more likely to speak to that person directly than use some other, less interactive source?

Almost half of the participants in the study, 48%, identified corporate knowledge regarding the function, structure, roles and responsibilities of areas of the organisation. This is to be expected when you consider the very diverse functions of local government in Western Australia and that the organisation is comprised of around 570 staff split over 26 organisational units. Participants that have been working for the organisation for between two and five years tended to identify this type of knowledge more than other participants. This indicates that once an individual becomes more familiar with an organisation, knowing who does what may be taken for granted.

Local governments are focussed on developing and maintaining a particular geographic area, so it is likely that individuals working in local government will require knowledge regarding the environment their organisation is responsible for, and operates in. A total of 45% of participants in the study identified environmental knowledge. While participants from all backgrounds identified this type of knowledge to some extent, participants from a creative

background tended to be more concerned with knowledge regarding their environment. This is probably because creative staff working in local government are typically using their design skills for urban development projects.

Knowledge of the historical background concerning a particular issue can help staff to understand an organisation's current position and lead to more informed decision making. The City encourages research into the historical background of current issues by including a 'background' section in all Council reports. A total of 41% of participants identified this type of corporate knowledge as being relevant to their work related tasks. Interestingly, a pattern emerged indicating that participants tended to identify historical background as a type of corporate knowledge once they had been working for the organisation for more than six years. One might have expected that staff who are newer to an organisation would be more likely to require access to historical knowledge. This seems to indicate that people may only utilise this type of corporate knowledge when they have been personally involved in the historical event in some way. The preferences of participants for utilising particular knowledge sources such as this will be explored more in the next section.

Local governments are responsible for a significant inventory of both fixed and moveable assets, such as buildings, roads, footpaths, drainage systems, street lighting, reticulation systems, vehicles, plant and other various items of equipment. In fact whole units of the City are responsible for the development and maintenance of these assets, employing a range of technical staff to conduct asset management activities. Given the scope of the organisation's asset management activities it was interesting that only 28% of participants identified knowledge about assets as a type of corporate knowledge, and this was mostly by staff from a technical background. This may suggest that this type of knowledge is not highly valued and therefore underutilised by staff across the organisation.

Knowledge of precedents that have been established in the past can assist staff decision making when faced with similar contemporary issues. Only 21% of participants identified this type of corporate knowledge. This may be due to staff believing that such precedents are captured in procedural knowledge, although as explored later, it may be difficult for procedures to capture this type of knowledge. It was very interesting to note that participants in younger age groups tended to identify this type of corporate knowledge more than those in older age groups. This could be due to staff only requiring this type of knowledge to make a decision when they are inexperienced, and once an individual has enough experience behind them they gain the confidence to make decisions without considering relevant precedents. Alternatively they may simply take this knowledge for granted once they have utilised it over a number of years.

The type of corporate knowledge that was least identified by participants, only 14%, was political knowledge. This may be due to staff operating in some roles not requiring this type of knowledge to successfully complete their work related tasks. This is supported by the fact that this type of knowledge was only identified by participants from an administrative or strategic background. The types of positions of some of the participants that identified political knowledge include executive, manager and project officer.

The first of a series of interesting observations regarding the differences between male and female participants emerged when analysing these knowledge types. When examining the number of different types of corporate knowledge that participants identified it was clear that a gender difference was discernable. As demonstrated in the table below, results showed that female participants tended to identify and use a broader range of knowledge types than male participants. This would suggest that females either utilise a broader range of knowledge when performing a task, or they are better at identifying and articulating the types of knowledge they use. Either way, it is an indication that women may make better knowledge workers than their male counterparts.

Corporate Knowledge Type	Males	Females	Variance
Historical	31%	54%	+23%
Environmental	38%	54%	+16%
Relational	56%	69%	+13%
Functional	44%	54%	+10%
Procedural	75%	85%	+10%
Precedential	19%	23%	+4%
Political	19%	8%	-11%
Asset	38%	15%	-22%

Table 3: Corporate Knowledge Types, Gender Comparison

Knowledge Sources

During the structured interviews study participants were asked to describe where they acquired the various items of corporate knowledge they identified. In other words, “how did you come to know that piece of knowledge?” The sources of corporate knowledge that were identified and described by participants can be grouped into the following five broad areas:

- Dissemination of Information
- Documentary Research
- Personal Contact
- Personal Experience
- Training

Dissemination of Information occurs regularly in larger organisations as an easy way of pro-actively providing current information to either individuals or groups of people, and can be a valuable source of corporate knowledge. This can occur in a number of ways, such as circulating or distributing copies of documents around an office, sending memos and now more commonly, e-mail messages. Participants referred to this source of corporate knowledge when they stated “it was circulated, so we have had the information”, “it could be a memo” and “they send out summary reports”. Information flows like this are common in organisations, but it does require the person that initiates the dissemination of the information to know that people will require the knowledge ahead of time.

A public relations officer described dissemination of information as a common source of knowledge he needs when answering media enquiries.

“... being able to access the Council agenda ahead of time helps me to prepare responses or anticipate responses to questions that might come along ... and also obviously from information passed to me by my manager, director and the CEO”.

In this scenario the officer is on the distribution list for the Council agendas and knows to browse through them to obtain relevant knowledge. Furthermore, other people in the organisation have made a decision to send him copies of relevant documents so that he may perform his role successfully.

Documentary Research is performed by people when they wish to seek out documented knowledge concerning a particular issue. This could include searching for and reviewing the contents of corporate publications, procedures, recorded precedents, photos, maps, and reports from previous studies and surveys. A human resource officer described this source of knowledge when he stated *“When I first started I just fiddled around and brought out a few documents to see what had been occurring previously ... this is what’s gone before”*. A number of participants described researching documentation when starting a new activity, especially when they were new to the organisation, to obtain relevant background and history.

An executive describing how he acquired the knowledge required to develop a policy identified documentary research as a knowledge source. He said he obtained the knowledge he needed by *“using relevant documents such as strategic plans, annual reports and all of those sorts of things as well as information like background information such as the report that was done...”* A manager also referred to this source of knowledge when she stated that *“it has all been very well captured in the past, certainly in the planning department files which are very extensive”*. Some participants indicated that while much corporate knowledge is captured in documentation, it is often

lacking depth and can be difficult to access. This difficulty with capturing corporate knowledge in documents will be discussed in the next section.

Personal Contact describes the informal, one-on-one interactions that occur between people in an organisation on a continual basis to access knowledge that is retained by others. This could be in the form of discussions with colleagues, asking questions of other staff, discussing issues with staff with relevant experience and receiving feedback from other staff and customers. A marketing officer discussing event permit processes described this knowledge source well when she stated:

“We didn't realise for example that when you put up a marquee over 3m x 3m that you have to contact Approvals because they need specific engineering specifications, and we only found that out by really just talking through it with [Officer A] who I work directly with and thinking that possibly that was the case, so we spoke to [Officer B] who put us on to [Officer C] and things like that, so it was a lot of trial and error with contacting people. I found that one of my best points of contact was [Officer D] actually, because he had been here for so long, he often could point me in the right direction so that was a lot of phone calls in that sense, but also there was certain people that knew in marketing, [Officer E] had been there for so long, 17 years, she knew who for me to contact, but it was a bit of trial and error in finding out how...”

In this example the officer personally spoke with at least five other staff to gain the knowledge she required to process just one type of local government permit.

An executive described how personal contact he has with staff and customers is a source of knowledge he needs to prepare reports to the Council.

“That'll be drawn again from a number of sources, like Community Forums and questions that might be asked at community forums so that's a corporate knowledge base ... We also get a lot of feedback from our

people on the ground because we have so many people in the field and I go around regularly and speak to our teams, they tell me bits and pieces from people that have come up to them when they have been working in a park or a particular issue about the locations of rubbish bins or all those sort of things, so it's also person to person."

Participants often referred to personal contact with other staff as an easy, rich and valuable source of corporate knowledge.

Personal Experience is a common method of acquiring knowledge, where people learn by participating in activities as they occur and experience issues first hand. Personal experience can be gained by trial and error, observation, on the job experience, and by simply participating in events. A records officer described this source when she stated that she gained the knowledge she needed by:

"... generally experiencing it and sitting down and doing it. I mean someone can tell you how to do something until they're blue in the face but you are not going to pick it up until you do it yourself. It's more gaining the experience that enables you to know how to do something usually."

This participant clearly expressed a preference for acquiring knowledge through personal experience than simply discussing how to perform an activity with a colleague.

A parking officer also described personal experience as a source of knowledge concerning the physical environment.

"The knowledge of streets and different areas in the city is by experience, you've got to go out there and look at it and study it and then build up a general knowledge of where things are... From my previous position as team leader because I was involved for 60% of my time out in the street, I was managing 18 different locations on any one given day so you build that knowledge up very quickly."

In this example, the officer was able to acquire knowledge of the physical features of the city by simply working in and experiencing the environment each day.

Training is typically a very formal method of acquiring knowledge and is generally considered the preferred method for obtaining professional knowledge, as evidenced by the common desire for staff to hold relevant qualifications. It appears to be a less common method of acquiring corporate knowledge, but does occur in the form of corporate training courses, one-on-one training sessions, and mentoring by more senior staff. An administrative officer described this source of knowledge when she stated “... a person had left from Rates and nobody knew from within Rates so it was from manuals and training courses, I picked it up from there.” In this example, the participant used training as an alternative source as they didn’t have the option of acquiring the knowledge through personal contact with a colleague.

A manager described some individual training he received from a human resource advisor.

“There was a time when I spoke to [human resource advisor] because I was having trouble trying to understand the process of how it works and so we just sat down and had an informal talk about what's the objectives, the true objectives, of a Progress Review and once I understood the logic behind it and what it meant to the organisation, I didn't have a problem.”

Rather than attending a formal corporate training course in staff performance management and development this participant gained the knowledge he required through a one-on-one, informal training session.

A number of participants described utilising a combination of different knowledge sources when researching particular issues. Some participants indicated that they would start with one source and then use the knowledge they had gained to identify other possible sources of knowledge. For example a person may research documents first and then contact an individual for

more detailed information. A customer service officer stated that her approach was:

“Reading through documentation first and then afterwards if there is anything that isn't clear I actually go straight to the person who would be responsible for the particular by-law and discuss it with them, if I've got any queries.”

Using a combination of sources can enable access to related or more detailed knowledge and can provide a more balanced view of an issue.

The five sources of corporate knowledge described above were ranked by the number of participants that identified them during the structured interviews. The rankings are shown in the following table.

Corporate Knowledge Source	Percentage
Personal Contact	83%
Personal Experience	76%
Documentary Research	55%
Training	41%
Dissemination of Information	38%

Table 4: Corporate Knowledge Sources

The different sources of corporate knowledge described above were compared to the demographic profiles of the study participants that identified them. Certain types of sources were more frequently identified by some demographic groups than others, providing some predictable and some interesting results which are discussed below.

The most frequently identified sources of corporate knowledge were personal contact and personal experience. A total of 83% of participants described personal contact and 76% described personal experience. Furthermore, out of the five different sources of corporate knowledge, these sources were highly identified by all the different demographic groups in the study. This may be because these two sources are the richest and most interactive,

allowing people to either use all of their own senses as they experience things first hand or question and probe someone else who has.

Documentary research was identified as a source of corporate knowledge by 55% of the study participants. It was, therefore, quite surprising to discover that participants from an administrative background didn't tend to identify this as a knowledge source. Administrative areas often have the creation, update and storage of documents as a key part of their role, yet participants from an administrative background seem to not use these documents as a source of knowledge. Similarly, these participants also didn't identify dissemination of information as a source of corporate knowledge. Perhaps this is because administrative areas often disseminate information, but rarely receive information from others.

In-house training in the form of formal courses, one-on-one instruction and mentoring seems like a likely source of corporate knowledge, however only 41% of participants identified this as a source. Not surprisingly, participants from an administrative background identified training as a source more than participants from other professional backgrounds. This is probably because the activities performed by administrative staff are often process driven and so easy to be learnt through structured training. At the other end of the spectrum were participants from a creative background, none of whom identified training as a source of corporate knowledge.

Out of the five different types of corporate knowledge sources, most demographic groups tended to identify documentary research and dissemination of information to a similar degree. This is quite logical given that they are both document based knowledge sources. Participants aged between 35 and 44 years were an exception to this pattern however. As evidenced in the table below, participants in this age bracket were more likely to identify documentary research and less likely to identify dissemination of information compared to participants in other age groups. This shows that these people are more likely to actively seek out documents to meet their knowledge requirements than to use information that is provided to them.

Perhaps this is due to these participants not trusting the quality or reliability of information that is provided to them, preferring to research topics themselves.

Corporate Knowledge Source	15-24	25-34	35-44	45-54	55-64
Dissemination of Information	50%	33%	17%	50%	63%
Documentary Research	50%	33%	83%	60%	63%

Table 5: Corporate Knowledge Sources, Age Group Comparison

Often participants identified more than one source of corporate knowledge, however most participants would not identify all five sources. Some demographic groups identified more sources than other groups, demonstrating a broader base for acquiring the knowledge they require to do their work. Participants from a strategic background tended to identify more sources of corporate knowledge than participants from other professional backgrounds. This is to be expected, as people working in strategic roles often require knowledge from a variety of sources for informed decision making. An interesting pattern emerged regarding the number of sources identified by participants. The longer a participant had been working in the organisation the more sources for corporate knowledge they identified. This indicates that over time, people discover and then utilise a broader range of knowledge sources, probably becoming better knowledge workers the longer they remain in the organisation.

The second interesting observation regarding the differences between male and female participants was discovered when analysing these results. Just as participants from a strategic background tended to identify more sources of corporate knowledge than other participants, one gender also tended to identify a broader range of knowledge sources than the other. As demonstrated in the table below, results showed that female participants tended to identify more corporate knowledge sources than male participants. This would suggest that females either utilise a broader range of sources when acquiring their knowledge, or they are better at identifying and articulating the various sources they use. Either way, it is another indication

that women may make better knowledge workers than their male counterparts.

Corporate Knowledge Source	Males	Females	Variance
Personal Contact	75%	100%	+25%
Training	38%	54%	+16%
Dissemination of Information	38%	54%	+16%
Personal Experience	81%	85%	+3%
Documentary Research	69%	54%	-15%

Table 6: Corporate Knowledge Sources, Gender Comparison

Knowledge Capture Processes

Knowledge capture can occur in organisations when people undertake a process of making the knowledge that only exists within their own mind into a more explicit form that can be communicated and shared with others. One way this is often done, is by a person analysing the knowledge they have on a particular subject and then transforming that knowledge into pieces of information (such as written text, a diagram or picture, or a recording of sounds and/or images). During the structured interviews study participants were asked to describe their experiences with such knowledge capture processes. Experiences with these processes can be as either a participant in the capture process or as a consumer of information that others have captured. Participants identified a wide range of issues regarding their personal experiences with knowledge capture processes.

The knowledge capture issues that were identified were ranked by the number of participants that identified them during the structured interviews. These issues and rankings are shown in the following table.

<i>Knowledge Capture Issues</i>	<i>Percentage</i>
Knowledge is captured in policies and procedures	31%
Speaking to people face-to-face is a richer source	31%
More complete capture reduces research time	28%
Reports and File Notes are effective for public capture	24%
Structured capture processes better than unstructured	24%
Verbally sharing knowledge with other staff to ensure capture	21%
Documents tend to only provide limited depth and context	17%
Procedures can be hard to write	17%
Procedures need to be detailed	17%
Procedures need to provide step-by-step instructions	17%
Capture best done at end of a process	14%
Format of captured knowledge greatly affects its usability	14%
Procedures need to be logically structured	14%
Procedures need to be tested and improved	10%
Quicker to access knowledge in documents than via people	10%
Work exchanges assist with knowledge capture	10%
Diaries and Notebooks are effective for personal capture	7%
Procedures can't capture all possibilities	7%
Procedures need to allow flexibility	7%
Technology makes knowledge capture easier	7%
Processes often capture facts but not feelings and opinions	3%
Collaborative knowledge capture more effective	3%
People need skills to effectively identify what's important	3%
Procedures need to avoid technical jargon / use plain language	3%
Procedures need to include graphical representations	3%
Shadowing of staff can assist with knowledge transfer	3%

Table 7: Knowledge Capture Issues

Participants discussed their experiences with writing or using procedures more frequently than any other form of knowledge capture. In fact 37% of all the knowledge capture issues raised by participants specifically related to procedures. This is not surprising when you consider that procedural knowledge was the most frequently identified type of corporate knowledge, with 79% of participants identifying it during the interviews. Some of the participants focused on what characteristics a procedure should have to make it most effective at capturing corporate knowledge. Participants

indicated that a good procedure should be detailed, logically structured, provide step-by-step instructions, include graphical representations, allow for flexibility, use plain language and avoid technical jargon.

A technician described the importance of using appropriate language and graphics in procedures when he stated:

“... the only problem I've ever had [with a procedure] maybe is that it's a little bit too 'jargony' ... I mean I know that's specific but some people tend to use jargon and you've got to assume that the person you are handing the doco to is not aware of all this jargon, they just need to do the job and I've suggested to those people that they use more screen images, because I find it's the easiest way, people can visualise what they have to do, they don't need to understand the process behind it necessarily but they can make sure it's done correctly.”

It seems that it is often as a consumer of captured knowledge that people learn better ways of capturing knowledge.

A manager, describing the quality of some procedures that he had reviewed, stated:

“It depends on who's writing them I guess and how willing they are to go into depth, I mean some of the ones that I've seen I've sent back to particular units because I look at them from the perspective that if I didn't know anything about the procedure then would I be able to use that particular procedure and pretty much carry it out with a high degree of accuracy. Some of them I don't even know what the procedure is. I still don't know when I look at what they've actually documented so I send that back and they need to provide more explanation. I try to go into as much depth as I possibly can, produce templates and everything else so that other people will not have to try and re-invent things that have already been done.”

A number of participants expressed the importance of considering the consumer of a procedure when capturing procedural knowledge.

Some participants provided a less positive perspective of the same issue, describing why procedures were often ineffective at capturing corporate knowledge. They discussed how procedures are hard to write, can't capture all possibilities and need to be continually tested and improved to remain useful and relevant. A compliance officer stated:

"In my area a lot of staff have been here 10 years or more and it's really hard to get them to document something which is, sort of, second nature to them and I really have trouble getting them to think in terms of maybe someone just walking in who doesn't have the background knowledge for a lot of the issues... I suppose it's maybe being one step removed from the actual task you can have a bit more judgement on what's needed and what isn't. The people doing it have a bit of trouble defining what they are actually doing; they just get in and do it."

While this participant found it was difficult for long serving staff to capture their corporate knowledge, he believed that newer staff found it much easier to capture knowledge as they were learning new processes.

An executive describing the capture of corporate knowledge concerning disaster management stated:

"That one is challenging because I'd really love to be able to put an A to Z of what to do if there was a disaster, but because every disaster is different I can't. So in some ways it's a bit frustrating because it really does take experience to handle a new disaster, there's no real cook book for it. Yes that ones difficult. We have certainly documented all the ones we've had; we've never had two the same... There's a variation in what kind of disaster it is, but the bigger variable is exactly which community it is in, because every community is different."

A number of participants felt that capturing corporate knowledge into a procedure was difficult as they couldn't easily capture all the various possibilities.

Many issues identified by participants related to difficulties they have experienced with knowledge codification processes. A high 56% of all the knowledge capture experiences discussed by participants concerned these difficulties. In addition to describing deficiencies with procedural documentation, participants described how documented knowledge can be incomplete, tends to provide only limited depth and context, and often captures facts, but not feelings and opinions.

An executive stated:

“... file notes are useful but everybody writes in a particular style, a particular manner, people tend to write relatively briefly, they don't want to write pages and pages and pages, so whilst you can gain an insight nothing is more able to give you good corporate knowledge than the depth of experience of people who've been involved in the issues for a long period of time. I mean Council Resolutions state the decision of Council but they do not show you the debate and therefore if you are truly going to understand the reason for a decision you have to have been present during the debate, and that's why it's important that we have people who have come up through the organisation who have got a depth of knowledge in it as well as people coming in from the outside. You've got to get a balance there, if you change everyone every few years then you lack the depth to the corporate knowledge, you'll have the record of fact but you won't necessarily have the record of rationale or the infighting that's gone on that's resulted in the decision being tempered by the people who were involved in making it. Decisions are often watered down or strengthened as a result of you know who has lobbied hard at the meeting, who's forced the decision one way or the other.”

While formal records of decisions capture a certain level of corporate knowledge, they may only provide a brief, factual and ‘sanitised’ view of the issue.

Participants also described how the format of captured knowledge greatly affects its usability and that people sometimes don't have the skills to

effectively identify what corporate knowledge is important and needs to be captured. A manager stated:

“... I think that there may be some decisions in there about the levels of which you report at, depending on what it is. We deal with information all the time and you could spend your time recording it and not actually doing anything so you do have to make some informed decisions about what you actually capture in a format that can be [understood], and how you capture it you know, do you capture all the detail ... otherwise the knowledge can become impenetrable, you have heaps and heaps of stats and nobody would understand what they meant so that the format of capturing the knowledge is really important so it can be used again.”

In contrast to many of the other participants, this person described how capturing too much detail without it being appropriately formatted can cause difficulties for the consumer.

In addition to knowledge codification methods, some participants identified knowledge sharing with colleagues as a method of capturing knowledge. 19% of all the knowledge capture experiences raised by participants referred to this approach to knowledge capture. This included verbally sharing knowledge with other staff, staff participating in work exchanges and shadowing staff before they leave the organisation. A team leader described this form of knowledge capture when he stated:

“It's just passed on by word of mouth, there's no real document that says here read this tonight and you should be a full bottle. It's just a matter of grabbing the guy and saying look this is how we do it, I'll show you, and all the little tricks, you know you get this tool and you pull this up and use the valve there for that and know where to dump rubbish, all these little things that we do everyday, it's just happened because it's been passed on... it's sort of locked in your brain from day to day the work that you do so really a lot of the corporate knowledge that we have in area maintenance is passed on by word of mouth and it's just a matter of remembering that stuff.”

Verbal methods such as those described by this participant capture corporate knowledge by ensuring it is known by a number of staff in the organisation, rather than by just an individual.

A number of participants indicated their preference for speaking to people face-to-face, rather than using codified knowledge. According to 31% of participants, speaking to people allowed a high level of interaction and thus made it a much richer source of knowledge. An executive recounted a situation where speaking to staff proved more beneficial than accessing documentation.

“... for me the difficulty is making sure you got complete knowledge. There isn't something missing out of it, say you got 80% but an essential document is missing ... the way around that is talking to people and picking out other peoples knowledge of things ... particularly if it's an issue that's been around for a long time. If you can find a person who's been involved in it, to sit down with them and just pick their brains. Recently we did a lot of research on the river wall and what the City has done, so [another officer] did a heap of looking through our information but one of the most useful sources... we just called in a number of people who have been in the City for the last 20 to 30 years who have been involved and just sat down and went through the whole thing with them. That tends to help fill the gaps.”

One of the reasons that people have difficulties using codified knowledge may be because the person documenting the knowledge typically does not know the precise need of the future consumer.

Motivations for Knowledge Capture

During the structured interviews study participants were asked to describe what usually motivates them to take time to capture the corporate knowledge they have. In other words, “why have you captured corporate knowledge in the past?” The motivations for capturing corporate knowledge that were identified and described by participants can be grouped into the following six broad categories:

- Assist the organisation
- Job satisfaction
- Just part of the process
- Make others' jobs easier
- Make own job easier
- Self protection

Assist the organisation to achieve its objectives was one of the more altruistic motivations for capturing corporate knowledge that was described by participants. This included objectives that are fairly common to most organisations, such as improving service quality and consistency, preventing duplication of effort, preventing a repeat of past mistakes, reducing costs and increasing efficiency. A supervisor stated that:

"I think it's just that we have got the interest of the City at heart and we have got budgets. Obviously we can extend for a longer life in units or wearing items, then we look very closely at that... Well it's to help me to do my job, but it's also ultimately to prolong and maintain costs within reasonable limits for the Council."

An events coordinator stated that a motivation for him was *"to be able to be consistent, perform my duties better as we go along"* and to *"add value to the kind of information and service we are offering customers."* A project officer simply stated that her motivation was to *"help the organisation"*. A number of participants in the study explained that they captured corporate knowledge because they believed it would help the organisation in some way.

Job satisfaction as a motivation for capturing corporate knowledge was quite a surprising motivation that was described by participants. A number of participants indicated that they enjoy capturing knowledge. Participants described how capturing knowledge made them feel valued in the organisation, contributed to them feeling pride for their work, how it allowed them to leave a lasting and valued legacy, and that it provided a record of their achievements. A manager described how leaving a worthwhile legacy motivated him when he stated:

“Well I think that if you are in a job, you spend a lot of time in your job, and you have got to enjoy what you do and as a result of that whatever you do in life you should be leaving a legacy ... everyone of us has got some capabilities of doing something and this is part of life.” And “Leave something worthwhile for people coming behind us. I love this City. I reckon it's a fantastic place to live and it's worthwhile doing your best.”

An events coordinator explained how he enjoyed capturing knowledge when he stated:

“I think by and large most people like to add information and knowledge to themselves or to their portfolio or whatever they are doing so you should enjoy that. It's a process that needs to be enjoyed. It adds variety to my day.”

An assistant described how knowledge capture contributed to her job satisfaction when she stated:

“I think it's what I learn out of it. What I'm gaining from it. I like to know the whole picture of what I'm learning not just a section of it. That irritates me a lot so I like to know the whole scenario of it.”

All these participants indicated that they gained some personal satisfaction or enjoyment from capturing corporate knowledge.

A human resource officer explained how he believes individual recognition contributes to job satisfaction and motivates people to capture corporate knowledge.

“I think most people from what I hear generally through the taskforce and the other groups that we have that people, they'd all like a bit more money, but more than anything they'd like to know that what they are doing is appreciated ... They wanted recognition and reward because that is the first thing they want. They do something well they just want one of the managers to come around and say that's really good, keep it up ... But that kind of thing is really good and I think if people are saying look we value your knowledge, we'd like to capture it as best we can and we'd like

you to help us in this way, and afterwards show them that yes it's been really good. Then anything else that comes along you won't have to keep knocking on the door, you'd probably have to lock them out of your office."

It is interesting that something as simple as verbal recognition can motivate an individual to capture corporate knowledge.

Just part of the process was another reason that participants provided for them capturing corporate knowledge. While this may not be considered to be a motivation as such, some participants described how capturing corporate knowledge was simply a result of them undertaking their work. This suggests that knowledge capture has become an automatic process for these participants with it being embedded in their daily work practices. A public relations officer stated:

"Well really the only thing that motivates me really is that it's I guess part of my job to do that. I don't do it for any sort of benevolent reason but I can see merit in having a lot of the stuff I do done in a format that can be accessed by other people and so I am supportive of that."

An executive also described how knowledge capture was just part of his work process when he stated:

"Well I think it's just part of management. You need to, certainly in the formal process of the file notes and the reports, that needs to be part of your workings, and if you are running something like a taskforce, a group, you need to have processes in place to do that..."

Capturing corporate knowledge simply as a by-product of other business processes is certainly a very attractive way of motivating people, but one that may be limited to the more formal business activities described by these participants.

Make others' jobs easier by providing them with the corporate knowledge they need to do their work, was described by participants as a motivation for capturing corporate knowledge. This motivation is closely related to the motivation to assist the organisation, but has a more personal tone with

participants describing how they capture knowledge to specifically help their co-workers. An executive also described how she wanted to help out others when she stated:

“Well I guess if it's something that's taken me a while to figure out then it's going to take someone else a while to figure out and there seems no point wasting someone else's time so I'll document it so it's there for next time.”

A marketing officer explained how negative experiences in her previous jobs motivated her to make it easier for others that follow her.

“... also just to help out the next person because I have often come into jobs where there has been no knowledge left and had to start from scratch, which is, there are benefits to that as well but it can be a bit tricky especially if there are particular administrative things or you know quirky things about an organisation that you really do need to know.”

A records officer described how she wanted to make it easier for her colleagues to do her job when she was on leave. She stated that her motivation for documenting her procedural knowledge was:

“Probably more to help [other records officers] because I know what it's like if you're trying to do something when there's no one there to help, you can try and guess your way through but you're never confident that you've actually done a good job.”

The desire of a person to help out their co-workers is a noble and powerful motivation especially in a highly collegial or team environment.

Make own job easier was an obvious motivation and one that was described by a number of participants. This is one of the more self-interested motivations and is rooted in the “what’s in it for me” concept. Participants described how capturing corporate knowledge made it easier for them to train new staff, assisted them with future tasks, ensured that their work was done well by replacement staff when they were on leave, reduced questions from their co-workers, or made it easier for them to learn. Like the records officer, a co-ordinator also described how he captured knowledge to help staff do his

job while he was on leave, but in this scenario it was more to ensure he didn't have problems to come back to. He stated:

“... for myself to go on leave and know that something is going to keep happening while I am on leave” and “... it's mainly just so it keeps going and I don't have a mess or things don't go wrong. Not very altruistic...”

These two examples show how two very different motivations can lead to the same outcome for knowledge capture processes.

A technician described how capturing procedural knowledge made his job easier when he stated:

“... the amount of time you spend doing the job that someone else could probably do if there was a procedure there. Like the amount of time that you get asked to do something and I've found that I'll verbally tell someone and they'll come back two weeks later and go how do you do this again. Originally that's my first motivation, knowing that if I'm not there or I don't need to be disturbed or if I'm in the middle of doing something else, I can just say ok here work off that, if you have a problem come back to me...”

The tendency for people to rely on staff with specialised knowledge can result in a great deal of interruptions for the individual, making it more difficult for them to do their job.

Self protection was also described as motivation for an individual to capture corporate knowledge. Some participants explained how they often captured corporate knowledge as a way of providing evidence of their actions and to protect their reputation. A manager described how he wanted to ensure he protected his reputation when he stated:

“They can clarify why I've done particular things. I guess there is also the perception that people always like to blame others when people have left an organisation, like ‘Oh they didn't do that particular work’, so at least if I can clarify why I've made particular decisions, there's certain accountability and transparency in decisions...”

An executive described how he captured knowledge to provide documentation in the future to help substantiate his actions. He stated that he captured corporate knowledge when:

“... experience tells me that it is important that it be recorded, or where I suspect I'll be called on to either justify a decision or an action later, or I'm going to be held legally accountable for a decision or an action later.”

The motivation of “self protection” is quite a traditional motivation for creating records, but is often only relevant to people working in positions with high levels of responsibility and accountability.

The six motivations for capturing corporate knowledge described above were ranked by the number of participants that identified them during the structured interviews. The rankings are shown in the following table.

Motivation for Knowledge Capture	Percentage
Assist the organisation	38%
Make own job easier	38%
Make others' jobs easier	34%
Job satisfaction	31%
Self protection	14%
Just part of the process	7%

Table 8: Motivations for Knowledge Capture

The different motivations for capturing corporate knowledge described above were compared to the demographic profiles of the study participants that identified them. Certain motivations were more frequently identified by some demographic groups than others, providing some predictable and some interesting results which are discussed below.

An interesting pattern based on the gender of participants emerged when analysing these results. The motivations of female participants for capturing corporate knowledge, ranked by the number of female participants that described them are shown in the table below.

Female Motivation for Knowledge Capture	Percentage
Assist the organisation	62%
Make others' jobs easier	54%
Make own job easier	31%
Job satisfaction	15%
Self protection	8%
Just part of the process	0%

Table 9: Female Motivations for Knowledge Capture

The top two motivations for female participants were to “assist the organisation” (62%) and “make others’ jobs easier” (54%). Both these motivations are quite selfless reasons for capturing corporate knowledge, suggesting that females may be more willing to capture knowledge even if they do not get any specific, personal benefit from it.

The motivations of male participants for capturing corporate knowledge, ranked by the number of male participants that described them are shown in the table below.

Male Motivation for Knowledge Capture	Percentage
Make own job easier	44%
Job satisfaction	44%
Self protection	19%
Make others' jobs easier	19%
Assist the organisation	19%
Just part of the process	13%

Table 10: Male Motivations for Knowledge Capture

The top two motivations for male participants were to “make own job easier” (44%) and “job satisfaction” (44%). In contrast to the female participants in this study, the male participants’ reasons for capturing corporate knowledge tended to be more self-serving. This indicates that males are more likely to capture corporate knowledge if they can see them gaining some personal benefit from it. This provides further reason to believe that females may make better knowledge workers than their male colleagues.

The age of the participants seemed to have some bearing on their motivations for capturing corporate knowledge. It was very interesting to discover that none of the participants under 35 years of age identified “assisting the organisation” as a motivation. This is especially significant given that this motivation was one of the highest ranking motivations described by participants. This may suggest that younger generations feel less connected with the organisations they work for and thus less inclined to perform an activity such as capturing corporate knowledge simply because it would be of benefit to the organisation.

At the other end of the age range of participants another interesting pattern emerged. Only participants over 45 years of age identified “just part of the process” as a motivation for capturing knowledge. This suggests that older generations work practices are more disciplined and result in the routine capture of corporate knowledge. Whether both of these age-related patterns are due to generational factors or simply a result of older participants having a greater level of experience is unknown. If they are generational, however, this could have a significant, negative impact on the capture of corporate knowledge in organisations as the workforce ages.

The level of the position occupied by participants not surprisingly had some bearing on their motivations for capturing corporate knowledge. The motivation of self protection is clearly related to participants working in positions with high levels of responsibility and accountability. This is supported by the result that only participants occupying Manager level positions and higher identified “self protection” as a motivation for capturing knowledge.

At the lower levels of the organisational structure another pattern emerged. Participants occupying lower level positions tended to identify “assist the organisation” as a motivation for capturing knowledge more than those in higher level positions. This was a most unexpected result. It suggests that staff working in more operational roles can more easily see how capturing corporate knowledge can be of benefit to the organisation than those working

in more strategic roles. Perhaps this explains why it is often difficult to gain executive support for knowledge management initiatives, while operational staff are often happy to participate in knowledge capturing and sharing activities.

It was not too surprising to find that the length of service of an employee affected their motivations for capturing corporate knowledge. The longer a participant has been working in the organisation the more likely they were to identify “assist the organisation” as a motivation. This is to be expected as the longer a person works for an organisation, the more connected they are likely to feel with the organisation and its objectives. With the trend for younger generations to change employers more frequently than older generations, this is likely to have a negative impact on the future capture of corporate knowledge in organisations.

When analysing these results a particular demographic characteristic of the participants stood out as a key differentiator for their motivations for capturing corporate knowledge. Results showed that the professional backgrounds of participants had a significant impact on their motivations. Participants from the same backgrounds had very similar motivations and often these motivations were quite different from participants from other professional backgrounds. This indicates that the promotion of corporate knowledge capture processes needs to be targeted and tailored according to the professional backgrounds of staff.

The following table shows the most frequently mentioned motivations for capturing corporate knowledge for participants from each professional background. The percentage relates to the proportion of participants within the demographic group that identified the motivation.

Professional Background	Motivation	Percentage
Administrative	Make others' jobs easier	57%
Creative	Make own or others' job easier	67%
Customer Service	Assist the organisation	71%
Strategic	Self protection	57%
Technical	Job satisfaction	60%

Table 11: Motivations for Knowledge Capture, Professional Comparison

The motivation of “self protection” was only identified by 14% of the study’s participants. A demographic analysis showed that this motivation for capturing knowledge was exclusively identified by participants from either an administrative or strategic professional background. Furthermore, only 14% of the participants from an administrative background identified this motivation compared to 57% of the participants from a strategic background. As staff working in more strategic roles are more likely to be subjected to higher levels of responsibility and accountability, it is not surprising this it was mainly this group of participants that considered “self protection” to be a motivation for them to capture corporate knowledge.

A small number of participants, only 7%, described how knowledge capture was simply a result of them undertaking their normal work processes. A demographic analysis showed that it was primarily participants from a technical background that identified this scenario. This may suggest that the work practices and habits of this group of staff is more structured and routinely results in the codification of knowledge.

People recruited to work in customer service roles are often chosen for their helpful attitudes. It was not surprising to find therefore that 71% of participants from a customer service background identified “assist the organisation” as a motivation for capturing knowledge. What was interesting is the fact that they identified this motivation significantly more than participants from all other professional backgrounds. This suggests that people from a customer service background are the group of staff most

willing to capture corporate knowledge simply because it will be of benefit to the wider organisation.

The motivation of “job satisfaction” was identified by 31% of the study participants. It was very interesting to note therefore that this was the top motivation for participants from a technical background. “Job satisfaction” was identified as a motivation for capturing knowledge by 60% of participants from this demographic group, which was significantly more than participants from all other professional backgrounds. This indicates that people working in more technical roles are more likely to enjoy the process of capturing corporate knowledge than staff from other professional backgrounds.

Administrative roles are typically created in an organisation to provide support and assistance to other staff. It was therefore not too surprising that the top motivation for capturing corporate knowledge for participants from an administrative background was to “make others’ jobs easier”. This motivation was described by 57% of participants from an administrative background, which was significantly more than participants from other professional backgrounds. This suggests that staff working in administrative roles will make time to capture corporate knowledge if they can see that it will benefit the staff that they are employed to support.

Extent of Knowledge Sharing

During the structured interviews study participants were asked to describe the extent to which they believe corporate knowledge is shared between staff in the organisation. In other words, “How often do you share corporate knowledge with other staff and how often do they share it with you?” Participants had a wide variety of views regarding the extent to which knowledge is shared within the organisation.

While a variety of views were expressed by participants, they generally presented either a positive or a negative view of knowledge sharing. Some participants felt that knowledge was shared well in the organisation. An executive stated:

“I think it's available and I think it's shared where people are working together on a specific issue or project or something of that nature. I think people are generally fairly good at knowing who to update, their need to be kept in the loop as it were and passing on information. Obviously there are examples of where that hasn't happened but generally I think we are fairly good at it.”

Other participants expressed this positive view of knowledge sharing.

“People are very happy to help you. They are happy to share the knowledge with you” and “I think it's pretty good. I haven't found any blockages...” and “I think it's shared better now certainly than when I first started by a long way”.

In addition to the view that knowledge is shared quite well in the organisation, a number of participants indicated that they believed knowledge sharing had improved significantly in more recent years.

Other participants presented a more negative view and felt that knowledge wasn't shared well in the organisation. A team leader described why she felt knowledge sometimes wasn't shared when she stated:

“I think we could do a lot more and a lot better. As I say it's knowing where to draw the line, you know, what's important to all people, what's important to just some and I suppose in one way, it's knowing, as we said before, what each area does ... It's knowing what each person does and how they might be affected.”

A project officer explained that while it may be good in some areas, other areas were not sharing knowledge well.

“I don't think it's shared to a great extent... in some units you could say, yes, there is just an accepted sharing and understanding. In other units you will find that won't happen for whatever reason. It could be part of the culture. People are not encouraged to share...”

Another team leader expressed this need for improved knowledge sharing when he stated:

“I really think that there's a lot of scope and there's a lot of areas where we can share a lot more corporate knowledge, particularly in [my unit], but it's just not happening.”

It was interesting to note that more participants indicated that they felt knowledge was shared well in the organisation than those that felt it wasn't shared well. A positive view was presented by 65% of participants in the study.

When participants were describing the extent to which they felt knowledge was shared in the organisation, they often made a distinction between pro-active and passive knowledge-sharing activities. Some participants discussed pro-active knowledge sharing, where a person decides to share corporate knowledge they have with others without being requested or prompted in some way. An executive described this pro-active sharing when he stated:

“Some people some of the time will decide they need to share a particular piece of knowledge, and they say the CEO needs to know this, so that's a deliberate decision to share knowledge by people.”

A marketing officer described how she actively shared knowledge with others:

“... through meetings and things but that's just basically bringing them up to date on projects that might impact on their areas, so I've had conversations with our arts and culture officer about things that we have a possibility of working together on, urban development, community services; those sorts of people.”

A number of participants also described how they used regular face to face meetings as an opportunity to pro-actively share the corporate knowledge they have gained with other people in the organisation.

In contrast to the pro-active sharing of knowledge described above, many participants described how people share corporate knowledge only when someone asks them for it. An executive described this when he stated:

“... knowledge is not just shared; knowledge is available to be shared. You have to know where to look or you have to ask for it ... generally speaking when people create knowledge they don't make a decision to share it, they make a decision to record it, and then when they get asked they share it...”

A public relations officer also described how he needed to seek out knowledge before it was shared.

“From my point of view I think it is shared pretty well but I mean when you say shared it's not always that someone has come up and offered me the information it is more a matter of me tracking it down, but so long as I maintain a reasonable level of contact with people around the organisation the sharing is pretty good.”

More participants indicated that they felt knowledge is shared passively rather than pro-actively. According to 48% of participants, corporate knowledge is shared by people when it is asked for, while only 34% described corporate knowledge being shared in a more pro-active way.

Some participants indicated that corporate knowledge was not shared well between certain groups of people in the organisation. A small group of participants (10%) described how managers were sometimes reluctant to share knowledge with other staff at lower levels in the organisational structure. One participant stated that:

“... staff in higher positions think that what they know isn't always important, that staff under them don't need to know it because it's not relevant to them, that's the impression I've perceived from a few units, that it's very, almost class orientated when it comes to sharing information.”

Another participant described how his supervisor often doesn't share knowledge with him.

“It's share on a need to know basis... I would like to know a lot more about how things operate in the budget. I'd like to know a lot more things about

my boss's job... I personally feel that they don't like sharing that because they don't want you to know too much..."

Knowledge-sharing issues like these, between higher and lower levels of the organisation, would be fairly common in larger organisations.

In local governments, a large proportion of staff operate outside the central office environment. Almost half of the organisation's employees work in parks and gardens, works depots, car parks, community facilities and on the streets. A participant that is based in an office at a works depot stated:

"I think it's shared down here among the supervisors... I don't know if we have the same contact with Council House. I don't know if we have the same interaction, let's say, or communication between the two areas, or what it maybe should be... there may well be a barrier between here and there, sort of thing."

A small group of participants (7%) indicated that corporate knowledge was not shared well between members of the 'inside' and 'outside' workforces.

A participant that was relatively new to the organisation described how she felt knowledge was not shared well with newer staff by people that had been working in the organisation for some time. She stated:

"I guess some people who have been in jobs for a long time sometimes will possibly a) they get sick of repeating the same information to new staff who come in or b) they feel that they somehow have to protect their knowledge in a way, because knowledge is power, and so sometimes it's a, I mean it's a generalization, but I find with the employees who have been here for a long time they are not as good at sharing their knowledge and sort of passing it on to the new round of employees and I guess it's a protective thing in a way or maybe it's just boredom."

This reluctance of longer serving staff to share knowledge with new staff should be of significant concern for organisations wanting to transfer the corporate knowledge of staff before they retire.

In 1994 the organisation was restructured by the State government and split into four separate local governments. A manager that was employed by the organisation prior to the restructure stated:

“... in the previous City of Perth, it was very much about empire building, you had the particular areas that would not share information with anybody because it gave away some of their power. The new City of Perth has improved immensely, I was gone for three years, and when I came back it was a completely new organisation and I think the programmes that have been put in place here, such as the Business Excellence Programme, the restructure of some of the units, such as the Approval Services Area, I mean that was always a huge area and used throughout local government, where people come in to get planning approvals, building applications and development applications and having to be pushed and shoved between three or four different areas, so there is a streamlining of the way in which our services are providing and there's a better sharing of knowledge I think within the Approvals area of how health, building and planning decisions can effect people, it's really improved the stakeholder perceptions of our professionalism as well, so I think that's worked extremely well.”

Some participants (33%) that have been working for the organisation for between 6 and 15 years indicated that knowledge sharing is better now than in the organisation prior to its restructure.

Further differences between male and female participants were discovered when analysing these results. It was interesting to note that female participants in the study tended to have a more positive view on the extent of knowledge sharing than male participants. This may indicate that females are more likely to both share their knowledge with colleagues and have others share it with them.

Barriers to Knowledge Sharing

During the structured interviews study participants were asked to describe barriers in the organisation that prevent the effective sharing of information

and knowledge between staff. In other words, “why do you think people do or don’t share their knowledge?” The barriers to knowledge sharing that were identified and described by participants can be grouped into the following five broad types:

- Environment
- Information
- People
- Process
- Technology

Environment-based barriers to knowledge sharing arise out of the physical and cultural environment in which an organisation operates. One participant described this type of barrier when she stated:

“I think starting with my team it's quite conducive to sharing knowledge because we are all positioned together in the open layout, we hear what's going on ... The organisation in general, I don't think it's as conducive to sharing corporate knowledge because it's so spread out and it's a large organisation and it's difficult to know what everybody is working on.”

Participants described the following barriers to knowledge sharing that are a result of the organisation’s environment:

- Lack of time to share knowledge due to high workloads and a fast pace of work.
- The structure of the organisation where people working on a particular issue are located in different teams reporting to different positions.
- A team culture where knowledge is not valued to the same level as other organisational assets.
- The geographical remoteness of different groups of staff making communication more difficult.
- The design of physical workspaces in office areas which compartmentalises work teams and hinders communication.
- A ‘silo mentality’ culture where people don’t understand and consider the needs of other areas of the organisation.

Information-based barriers to knowledge sharing relate to difficulties people having accessing information resources in the organisation. One participant described this type of barrier when she stated that:

“They will toss things out because they can't see any use for them and other people think that's something that we should have kept. A lot of corporate knowledge has gone the way of the trashcan and it's impossible to retrieve it if it's been physically trashed. And having been here for a long time that's a real problem, there is an awful lot of corporate knowledge that left with the restructuring and even now there are people who do not see the importance of corporate documents, corporate memory.”

Participants described the following barriers to knowledge sharing which is a result of how the organisation's information is managed:

- People being overloaded with a large volume of information making it difficult to find the information they need.
- People filtering information they pass on resulting in valuable information not being received.
- A lack of information on particular topics being created or retained by the organisation.
- The inability to find information that is retained by the organisation.
- Difficulties in quickly publishing information for others to be able to access.
- Discontinuities in how information has been stored over time making it more difficult to access a complete history of long term issues.

People-based barriers to knowledge sharing relate to the ways in which individual staff relate and work with each other. One participant described this type of barrier when he stated that:

“... people, humans don't like to be placed in vulnerable positions, they do not like to feel that their efforts, thoughts, feelings or anything are exposed to people they do not know, and as soon as you codify something that can go now to the hit identifier and some hit eyed twit can now look at that and laugh at me so to speak.”

Participants described the following barriers to knowledge sharing that are a result of poor working relationships between staff in the organisation:

- Lack of trust between staff means that knowledge isn't shared for fear of what may be done with it.
- Lack of honesty between staff resulting in the communication of inaccurate or incomplete information.
- People not making time to share their knowledge due to laziness.
- People not sharing knowledge due to lack of thought or arrogance.
- An unwillingness of people to properly research issues.
- People lacking the communication and interpersonal skills to share knowledge with others.
- A defensive attitude or a fear of embarrassing themselves or other staff.
- Lack of good, open communication between staff.
- People wanting to protect their power base or try to maintain 'job security'.

Process-based barriers to knowledge sharing arise out of flaws in an organisation's business processes. One participant described this type of barrier when she stated that a barrier was:

"Having somebody to pass the corporate knowledge on to in a timely way and [knowing] how you actually do it. ... [another officer] is going to retire ... one way would be to have somebody shadowing him for twelve months, probably unrealistic, we manage a bit through relieving when people go on holiday and other people come in, so you get a bit of passing it on at that time, but unless we are prepared to actually have the resource so that we can train somebody up over a fairly extended period of time, I don't know how you can capture a lot of that stuff. ... So I think that is a barrier ... we don't allow people to be trained up. We tend to just buy from outside, you know somebody leaves and we just go out there on the market and buy. ... but they don't have any of our corporate knowledge, we don't grow from within, if we had a stronger belief in growing our own

and putting the resource to it then I think that we would transfer more corporate knowledge.”

Participants described the following barriers to knowledge sharing that have resulted from problems with the organisation’s processes:

- The use of specialist or technical language when using processes to capture and share knowledge making it difficult for other staff to understand and interpret.
- Inadequate use of the organisation’s reward and recognition process to recognise the efforts of staff sharing knowledge.
- Processes not providing an opportunity for staff to share their corporate knowledge with others.
- Poor induction and orientation of staff resulting in people not knowing staff in other areas of the organisation.

Technology-based barriers to knowledge sharing relate to staff having inadequate access to appropriate information technology resources. One participant described this type of barrier when he stated:

“... I've been here now two years and I've had no Lotus Notes training, nothing ... I haven't had any other stuff except for the record keeping system, and that's the only computer training I've had here in two years ... when I first came here I went to my machine and I pulled down the menu and I thought what the bloody hell is all this, you know all these for what, straight in, no word no nothing, and people are already talking to me about corporate, about the I drive, the T drive, so I said can I have a mud map or a break down to how all these relate and what software is on each one.”

Participants described the following barriers to knowledge sharing which result from the organisation’s information technology infrastructure:

- Lack of information technology for staff working at outposts hindering their ability to communicate with other staff and accessing electronic information.

- An over reliance on information technology to share knowledge with staff resulting in people with limited IT access or skills not receiving information.
- Lack of staff training in the effective use of the organisation's information technology to access and share information.

The five types of barriers to knowledge sharing described above were ranked by the number of participants that identified them during the structured interviews. The rankings are shown in the following table.

Knowledge-Sharing Barrier Type	Percentage
People	86%
Environment	76%
Information	38%
Process	38%
Technology	24%

Table 12: Knowledge-Sharing Barriers

The different types of knowledge-sharing barriers described above were compared to the demographic profiles of the study participants that identified them. Certain types of barriers were more frequently identified by some demographic groups than others, providing some predictable and some interesting results which are discussed below.

The length of time a person has worked in an organisation seems to have a significant effect on their views regarding knowledge-sharing barriers. An analysis of the results showed that the longer a participant had worked in the organisation the more likely they were to identify more of the different types of barriers to knowledge sharing. This was not too surprising as the longer serving members of staff have had greater opportunity to experience barriers in the organisation. It does indicate however that knowledge-sharing barriers are not trivial matters that someone can quickly overcome and easily forget about.

The top two types of barriers to knowledge sharing were people and environment based with 86% and 76% of participants identifying them respectively. Both these types of barriers tended to be identified by all demographic groups in the study. This suggests that these barriers are wide spread and affect knowledge sharing among all types of people working in the organisation.

Information-based barriers to knowledge sharing were identified by 38% of the participants in the study. It was interesting to find that two particular demographic groups identified these types of barriers more than other groups. Participants in positions below level six, a lower level in the organisational structure, identified these types of barriers more than participants in higher level positions in the organisation. This may be because people working in higher levels positions often delegate information gathering tasks to people in lower level positions. The other group of participants were those that had worked in the organisation for over 15 years. This could be because they are more likely to use documentary research as a knowledge source and as a result have experienced more barriers when trying to access information.

An analysis of these results against the professional backgrounds of participants tended to show that most groups identified the different types of barriers to knowledge sharing to a similar degree. The main exception to this was participants from a strategic background. These participants tended to identify process type barriers less than participants from other professional backgrounds. This is probably because people working in more strategic roles are less likely to be personally involved in the day to day processes of the organisation and so have less opportunity to experience these types of knowledge-sharing barriers.

Technology-based barriers to knowledge sharing were the least identified in the study with only 24% of the participants discussing this type of barrier. It was not surprising to find that technology was only considered to be a barrier to knowledge sharing by participants over 35 years of age. Furthermore, the

older the participant the more likely it was for this barrier to be identified. This demonstrates that a greater level of investment into training older employees in the use of current technologies is required.

Another interesting observation regarding the differences between male and female participants was discovered when analysing these results. One gender tended to identify more types of barriers to knowledge sharing than the other. As demonstrated in the table below, results showed that female participants tended to identify more types of knowledge-sharing barriers than male participants. This would suggest that females either experience more barriers when sharing knowledge, or they are better at identifying and articulating the various barriers they have encountered. As female participants tended to have a more positive view regarding the extent of knowledge sharing in the organisation, it is probably more likely to be the later. The ability to better identify knowledge-sharing barriers is another indication that women may make better knowledge workers than their male counterparts.

Knowledge-Sharing Barrier	Males	Females	Variance
People	88%	100%	+13%
Environment	63%	100%	+38%
Information	31%	54%	+23%
Process	25%	54%	+29%
Technology	31%	23%	-8%

Table 13: Knowledge-Sharing Barriers, Gender Comparison

Information Management Processes Utilised

During the structured interviews study participants were asked to describe the various information management processes they regularly use at work. In other words, “how do you store and access information?” Participants identified a number of personal and organisational processes that they use to manage their information. The information management processes described by participants were as follows:

- Intranet

- Record Keeping System
- Land Information System
- Other Corporate Systems
- Corporate Library
- Local or Personal Libraries
- Personal Working Files
- Personal Diaries
- Spreadsheets
- Project Management Tools

Using the organisation's **Intranet** for information management was only described by 14% of participants in the study. At the time of conducting this study, the organisation's intranet was relatively new. It was not supported by a Content Management System at that stage and so distributed authoring, or 'self-publishing' was not available to staff. As a result the amount of content published on the intranet was low. Some participants indicated that they used the organisation's intranet as a means of accessing formally published, corporate documents.

Using the organisation's **Record Keeping System** for information management was described by most participants in the study, with of participants 76% identifying it. This result was not surprising, as the organisation had just been through a major project to develop and improve its record keeping system (RKS) and has been operating ongoing awareness, training and education programs for a number of years. The RKS stores unstructured electronic information in the form of word processed documents, spreadsheets, presentations, photos, graphics, significant email messages and digitised documents, maps and plans. It also provides an index to hard copy documents stored in files, archive boxes and on microfilm. Many participants indicated that they regularly use the organisation's electronic record keeping system to store and retrieve information.

Using the organisation's **Land Information System** for information management was described by only 14% of participants in the study. In contrast to the organisation's record keeping system, the land information system (LIS) is used by a relatively small group of staff. The LIS stores structured information regarding properties that are located within the local government's boundaries. Matters covered by the LIS include building and development approvals, event and traffic related permits, public health inspections, parking and ranger infringements, licencing of eating houses and dog registrations.

Using one of the organisation's **other Corporate Systems** for information management was described by 28% of participants in the study. The City operates a large number of corporate systems to support the wide ranging functions of local government in Western Australia. Corporate systems that were described by participants, other than the RKS and LIS described above, included Lotus Notes (email, calendar, contacts and database package), Swift (maintenance work order system), Hansen (asset management system), Finance 1 (financial management system), Business Objects ('Business Intelligence' reporting system), ISYS (full text retrieval system used for searching Council minutes) and AMLIB (library management system).

Using the organisation's **Corporate Library** for information management was described by only 10% of participants in the study. The City's corporate library is staffed by a part-time librarian and provides an online register of predominantly hard copy information resources relevant to the functions of the organisation. Types of items held by the corporate library include published texts, journals and periodicals, Australian standards, newspapers, and various multimedia items. It is the organisation's policy to submit copies of all their publications to the corporate library for permanent retention.

Using **Local or Personal Libraries** for information management was described by 28% of participants in the study. This is significantly more than the proportion of participants that use the corporate library. Local libraries are

maintained by just one area of the organisation and are generally for their exclusive use. A personal library is created and maintained by an individual staff member, is usually housed in their work area and is generally just for their personal use. As these libraries are physical collections of information resources, it suggests that people may prefer to utilise collections that are stored close to their work areas, rather than in a central location, for quick access and reference. The use of these local and personal libraries instead of the centrally accessible corporate library reduces the ability of staff to easily identify and access these hard-copy information resources.

Using some form of **Personal Working Files** for information management was described by 34% of participants in the study. This is significantly less than the proportion of participants that use a 'centralised' file in the organisation's record keeping system. Personal working files are created and maintained by an individual staff member, are usually kept in their physical work area or on a local network drive, and are generally for their personal use. Anecdotal evidence suggests that the use of personal working files by staff in the organisation used to be much higher. The use of working files has decreased in more recent times due to the introduction of the organisation's electronic record keeping system. This system allows people to store their information on 'centralised' files, but still access them from their work areas through their personal computers.

Using **Personal Diaries** for information management was described by 7% of participants in the study. One participant, who spends a lot of his time working out in the field, indicated that he used his hard copy diary almost exclusively to manage his information. While he has access to the organisation's computer systems from his office located at the depot, he doesn't have access when he is working in one of the city's parks or gardens. For this participant, portability of his information seemed to be the key driver behind the use of his diary for information management.

Using **Spreadsheets** for information management was described by 14% of participants in the study. Some participants described how they have created electronic spreadsheets to store and retrieve structured information. This

may be as a quick reference for technical information as in the case of one participant or to help keep track of the status of activities as in the case of another. The use of spreadsheets for information management seems to be prevalent where there are no corporate systems that cover the type of information or perhaps to address a deficiency in an existing corporate system.

Using **Project Management Tools** for information management was described by 10% of participants in the study. Some participants working in coordination or project management roles indicated that they use electronic project management tools to assist with the management of their information. Project information managed by these systems can include details of activities to be performed, activity timeframes and dependencies, resources allocated to activities, and the current status of projects.

The various information management processes described above were ranked by the number of participants that identified them during the structured interviews. The rankings are shown in the following table.

Information Management Process	Percentage
Record Keeping System	76%
Personal Working Files	34%
Other Corporate Systems	28%
Local or Personal Libraries	28%
Intranet	14%
Land Information System	14%
Spreadsheets	14%
Corporate Library	10%
Project Management Tools	10%
Personal Diaries	7%

Table 14: Information Management Processes

The information management processes described above include a mix of electronic and physical (or manual) processes. It was not too surprising to note that participants identified electronic processes more frequently than

physical processes. Electronic processes were identified by 66% of participants, compared to only 34% identifying physical processes. In today's work environment where nearly all office staff have personal access to a networked computer and regularly use it throughout the day, it is to be expected that electronic processes would dominate more traditional processes. This does indicate however that those physical information management processes, while certainly in decline, are still used in organisations and continue to provide many people with a way of managing their information.

The information management processes described above also include a mix of organisational and personal processes. It was pleasing to note that participants identified organisational processes more frequently than personal processes for managing their information. Organisational processes were identified by 63% of participants, compared to only 37% identifying personal processes. This is probably due to the City providing a number of well developed and supported organisation-wide information management processes and actively encouraging staff to utilise them. Reasons that people may prefer to use a personal rather than an organisational process, when one exists, may include lack of training, inaccessibility of centrally stored information and lack of personal control over how their information is managed by an organisational process.

Knowledge Capture Purpose

During the structured interviews study participants were asked to describe the organisational issues that they felt the capture of corporate knowledge could potentially address. In other words, "What are we hoping to achieve by capturing corporate knowledge?" The purposes for capturing corporate knowledge that were identified and described by participants were very varied but can be grouped into the following ten broad categories:

- Assist with organisational learning
- Capture knowledge of retiring staff
- Improve communication and cooperation

- Improve decision making
- Improve management of assets
- Improve quality of products and services
- Improve staff morale
- Predict and prevent future problems
- Reduce duplication of effort
- Reduce risk exposure

Assist with organisational learning was identified by some participants as a reason for the organisation to want to capture its corporate knowledge. As described by such authors as Goh (2002), the sharing of knowledge is a key dimension of the 'learning organisation'. A learning organisation is one that strives to continually learn from its experiences for the continuous improvement of its products, services and systems. A manager articulated the link between knowledge capture and organisational learning when she stated that:

"... it really comes from a big investment in the experiences of those people [staff] and unless you can capture their experiences somehow, you are not learning ... it needs to be part of the learning because unless you capture what the person has learnt through their experience then when they go then all that experience and learning has gone out the door. It's integral to having a learning and developing organisation."

The capture of corporate knowledge to help an organisation learn from the collective experiences of its people is an obvious purpose, but perhaps one that is mostly appreciated by those working towards the longer term development of the organisation.

Capture knowledge of retiring staff was identified by a number of participants as a reason why an organisation would want to capture its corporate knowledge and has clear links back to the concept of the learning organisation. This was not at all surprising considering the amount of recent discussion regarding Australia's 'aging workforce' and the problems that will create for knowledge retention in organisations in the near future. A human

resources advisor described this issue of the aging workforce when he stated:

“Well one of the key ones I suppose is the demographics, the aging workforce within the City. I would imagine that it would be pretty much fact that if a lot of them decided to retire next month, probably they could...”

A customer service officer also explained this issue and the implications for accessing corporate knowledge when she stated:

“I really think that we have got a lot of knowledge with quite an aging work force. There aren't too many younger people within the City and I think that the amount of information that perhaps people knew prior to the split of the City of Perth, you know, even before that, that'll be lost. So many of the people who have been here 20 years, right, it's not until maybe there not here that you realise how much they actually knew...”

Capturing the corporate knowledge that has been accumulated by long serving members of staff before they retire may be an overly ambitious objective, however it is often presented as a key reason for undertaking knowledge capture initiatives.

Improve communication and cooperation was also described by a number of participants as a reason for an organisation to capture its corporate knowledge. When sharing knowledge in a pro-active way with others, some form of communication must be utilised to transfer that knowledge to the intended recipients. A project officer described how she thought that capturing corporate knowledge could improve communication and cooperation between areas when she stated:

“I mean, really, if you look at some of the issues; I think we could be sharing information as to what our business is, what we are about, despite what people say, we are a business. I think people need to be made more comfortable about sharing information...”

Communication and knowledge sharing are two closely related areas and so it is not surprising that people believe that resolving internal communication issues is a purpose of knowledge capture initiatives.

Improve decision making was described by some participants as a key reason for capturing corporate knowledge. This is based on the concept that good decisions are based on facts rather than feelings and opinions. A manager described how decision making may be improved if corporate knowledge was captured better in the organisation.

“The capture of vital information which helps the organisation manage its decisions, ensuring that we have the information there that ensures for people in the future to look back and see how and why actual decisions were made and to ensure that there is consistency there, at least in some of our knowledge too, using that past knowledge in the development in future decisions that we might make... and it can only help us develop as a more mature organisation too because we are being more consistent in our decision making and we know that we are basing our decisions upon sound judgements and sound information and sound data.”

Although decision making occurs at all levels of an organisation, the idea that better access to an organisation’s corporate knowledge will improve decision making is often only recognised by people who are working in more strategic roles.

Improve management of assets was described by one group of staff as a purpose for corporate knowledge capture. A manager described how capturing corporate knowledge regarding the organisation’s assets is essential for asset management activities.

“I would go back to the example that I gave on Asset Management I mean that has had a huge effect on the City, of knowing exactly the state and the value of your assets. It is a big project but it is just so important in making decisions that you can assess the value of it, what it's going to cost to replace it, also on maintenance it's another big thing, maintenance

is extremely important because if you maintain something it is going to last longer... so you've got to deal with all of that knowledge.”

Given that 28% of participants described asset knowledge during the study, it is not surprising that the same participants would also indicate that capturing this knowledge would improve the management of the organisation's many and varied assets.

Improve quality of products and services was described by many participants as an overall purpose for capturing corporate knowledge. Participants indicated this purpose when they stated:

*“It would assist in making sure that people do things in the right way”,
“Well I guess it is always hopefully going to result in better service for our customers...” and “I think the biggest thing is consistency, sharing knowledge, improved standard of work and better customer service, internal [and] external...”*

The City has actively fostered a strong customer service culture since it was restructured in 1993. It is not surprising therefore that participants feel that capturing corporate knowledge would assist with the organisation's overall objective of improving the quality of its products and services for its customers.

Improve staff morale was described by one participant as a purpose for capturing the corporate knowledge of staff. A team leader described this purpose when he stated:

“Well I think if we can capture corporate knowledge it would make it a better organisation and I think mostly it's going to motivate staff. If staff can see that they are important and that their opinion is worthwhile and the knowledge they have gained over the 10, 20, 30 years they've been here is actually worth something, the morale would just pick up a hundred fold so I think gathering it and actually using it and being appreciative of it is the main thing, as opposed to just doing it formalistically.”

The idea that capturing the corporate knowledge of staff would lead to improved morale and presumably more productive staff was an unexpected yet interesting response. The literature often discusses how reward and recognition needs to be provided to staff to encourage them to capture their corporate knowledge. This response suggests however that recognition of a staff member's knowledge can lead to other human resource management benefits beyond the capture of corporate knowledge.

Predict and prevent future problems was presented by some participants as a purpose for capturing corporate knowledge. A director described this purpose when she stated:

"I guess we can use [captured knowledge] as almost being able to second guess what's about to come your way as well because you've got all this knowledge that you've learnt from, there shouldn't be too many surprises coming up because a lot has happened in this organisation over the years and we should have learnt from all those things..."

The purpose of learning from past mistakes and experiences to both predict and prevent problems from occurring in the future has a connection to improving decision making, but takes a more proactive view.

Reduce duplication of effort was described by some participants as a purpose for corporate knowledge capture. One participant described this purpose well when she stated:

"Stop people re-inventing the wheel. Definitely. I think it would also keep some of the history of various things, because I know after the restructure various things were going on and [my manager] would say well we've already done that... we've been there, but the people that were sort of involved in all that had all taken redundancy and gone."

The continuous nature of local government activities means that issues that have been dealt with in the past often re-emerge. If the corporate knowledge regarding these issues is captured in the organisation, duplication of effort can be avoided.

Reduce risk exposure was also described by participants as a reason an organisation would capture its corporate knowledge. A compliance officer explained how capturing corporate knowledge assisted with risk management.

“... for risk management purposes we do inspections of places likes the backpackers’ lodges and the night clubs and all that. If we don't capture the knowledge that we gather during those inspections and then the place burns down the City could be questioned on what we were doing before the accident happened.”

It is increasingly common for governments to be held to account for things that they did or did not do. Capturing corporate knowledge regarding actions taken to reduce risk, particularly public risks, can help an organisation to reduce its risk exposure.

The ten purposes for capturing corporate knowledge described above were ranked by the number of participants that identified them during the structured interviews. The rankings are shown in the following table.

Knowledge Capture Purpose	Percentage
Improve quality of products and services	38%
Capture knowledge of retiring staff	28%
Improve communication and cooperation	24%
Reduce risk exposure	21%
Improve decision making	21%
Predict and prevent future problems	17%
Assist with organisational learning	17%
Reduce duplication of effort	17%
Improve management of assets	14%
Improve staff morale	3%

Table 15: Knowledge Capture Purpose

The different purposes for capturing corporate knowledge described above were compared to the demographic profiles of the study participants that identified them. When analysing these results a particular demographic

characteristic of the participants stood out as a key differentiator for their view of the purpose of capturing corporate knowledge. Results showed that the professional backgrounds of participants had a significant impact on their views. Participants from the same backgrounds had very similar views and often these views were quite different from participants from other professional backgrounds. Not surprisingly, this is the same result as the related area of motivations for capturing corporate knowledge. This provides further support for the notion that the promotion of corporate knowledge capture processes needs to be targeted and tailored according to the professional backgrounds of staff.

The top purposes for capturing knowledge, identified by participants from a **customer service** background, are shown in the table below. It was not surprising to find that to “improve quality of products and services” was the most frequently identified purpose for participants from this professional background.

<i>Knowledge Capture Purpose</i>	<i>Percentage</i>
Improve quality of products and services	57%
Capture knowledge of retiring staff	43%
Improve communication and cooperation	43%

Table 16: Knowledge Capture Purpose, Customer Service Background

The top purposes for capturing knowledge, identified by participants from an **administrative** background, are shown in the table below. These participants identified a wide range of purposes. Although the top three purposes are the same as participants from a customer service background, they also identified other purposes.

Knowledge Capture Purpose	Percentage
Improve quality of products and services	43%
Capture knowledge of retiring staff	43%
Improve communication and cooperation	29%
Improve decision making	29%
Assist with organisational learning	29%

Table 17: Knowledge Capture Purpose, Administrative Background

The top purposes for capturing knowledge, identified by participants from a **technical** background, are shown in the table below. As 60% of participants from a technical background described asset knowledge during the study, it was not surprising to find the same high proportion of participants in this group identifying the improved management of assets as a purpose for capturing knowledge.

Knowledge Capture Purpose	Percentage
Improve management of assets	60%
Improve quality of products and services	40%
Reduce risk exposure	40%
Predict and prevent future problems	40%

Table 18: Knowledge Capture Purpose, Technical Background

The top purposes for capturing knowledge, identified by participants from a **strategic** background, are shown in the table below. This group of participants identified the widest range of purposes for capturing knowledge. Given the management focus of participants in this demographic group it was to be expected that improving decision making and reducing risk exposure would be at the top of this list.

Knowledge Capture Purpose	Percentage
Improve decision making	57%
Reduce risk exposure	43%
Improve quality of products and services	29%
Predict and prevent future problems	29%
Assist with organisational learning	29%
Reduce duplication of effort	29%

Table 19: Knowledge Capture Purpose, Strategic Background

The results of this research project presented above lead to a number of useful findings regarding the capture of corporate knowledge in local government. These findings and some recommendations for organisations wanting to develop and improve knowledge capture processes are presented in Chapter Six: Conclusion, which follows.

CHAPTER SIX: CONCLUSION

While some of the results of this study presented in Chapter Five were quite predictable and supported by the literature, others were rather more unexpected. These findings hopefully lead to some interesting conclusions being drawn regarding methods for capturing corporate knowledge in an Australian local government context. This final chapter summarises the key findings of this research project and provides some recommendations for the development and improvement of processes in local government for the capture of its corporate knowledge.

People working in local government can identify a range of different types of corporate knowledge they need to undertake their duties. The types of corporate knowledge used in the City of Perth are procedural (79%), relational (62%), functional (48%), environmental (45%), historical (41%), asset (28%), precedential (21%), and political (14%). Some of these types of corporate knowledge are used more often than others and many tend to be utilised to a greater or lesser extent by different groups of local government workers. The following findings were of particular interest:

- Procedural knowledge is frequently used by all local government workers, indicating that this is a basic type of corporate knowledge that people require for most tasks and activities.
- Relational knowledge is also used very frequently, but tends to be used more by people that have been working in a local government for longer.
- Once people become more oriented in an organisation, knowing 'who does what' is often taken for granted.
- People from a creative background tend to be more concerned with knowledge regarding their environment.
- Historical knowledge is mostly used by people that have been personally involved in the historical event in some way.
- Knowledge about assets is mostly used by people from a technical background and is underutilised by other people in local government.

- People consider relevant precedents when making a decision mainly when they are inexperienced.
- With the exception of people working in strategic roles, most people do not need political knowledge to successfully perform their work.

Different knowledge capture methods need to be established by local governments that are appropriate for these very different forms of corporate knowledge. Furthermore, these methods need to be designed to meet the needs of the groups of workers that most frequently utilise the different knowledge types. The 'embeddedness' of the knowledge in the people that hold the knowledge and the absorptive capacity of the groups of people that are likely to use the captured knowledge also needs to be taken into account.

Corporate knowledge is acquired by people working in local government through a number of different sources. The sources of corporate knowledge in the City of Perth are personal contact (83%), personal experience (76%), documentary research (55%), training (41%), and dissemination of information (38%). Some of these sources of corporate knowledge are used more often than others and many tend to be utilised to a greater or lesser extent by different groups of local government workers. The following findings were of particular interest:

- Personal contact and experience are the most highly used sources for corporate knowledge by all local government workers, probably because they are more likely to provide people with *a posteriori* knowledge.
- Although people in administrative roles are often involved in the creation, update and storage of documents they don't tend to use these documents as a source of knowledge.
- In-house training in the form of formal courses, one-on-one instruction and mentoring seems like a likely source of corporate knowledge however it is not highly used by people in local government.

- People aged between 35 and 44 years are more likely to actively seek out documents to meet their knowledge requirements than to use information that is provided to them, perhaps due to a lack of trust.

Some groups of people identify more sources than others, demonstrating a broader base for acquiring the knowledge they need to do their work. People working in strategic roles tend to use more sources of corporate knowledge than people working in other types of roles. Over time everyone seems to discover and utilise more sources of corporate knowledge, probably becoming better knowledge workers the longer they remain in the local government. Considering the current high turn over in staff that many local governments face, this has a significant implication for knowledge management. Induction strategies to make it easier for people that are new to an organisation to access relevant people and codified knowledge may assist with this problem.

Difficulties discussed in the literature with knowledge codification processes have also been experienced by people working in local government. The experiences of people in the organisation suggest that when local governments are designing knowledge capture processes the following key issues need to be considered:

- Rather than long serving staff capturing their corporate knowledge, it may be easier for newer staff to capture knowledge as they learn new processes.
- A good procedure should be detailed, logically structured, provide step-by-step instructions, include graphical representations, allow for flexibility, use plain language and avoid technical jargon.
- Procedures need to be continually tested and improved to remain useful and relevant.
- Codified knowledge needs to capture feelings and opinions as well as facts; otherwise it will only provide a brief, factual and sanitised view of the issue with limited depth and context.

- Verbal methods of knowledge transfer can result in the capture of corporate knowledge by ensuring it is known by a number of people in the local government, rather than by just one individual.

It seems that it is often as a consumer of captured knowledge that people learn better ways of capturing knowledge. One of the key reasons that people have difficulties using codified knowledge is because the person codifying the knowledge typically did not know the precise need of the future, 'downstream' consumer. Methods for capturing corporate knowledge in local government must therefore ensure that people using the capture process focus on the identified needs of the intended consumer.

Authors such as Goh (2002) have described how lack of staff motivation is often a key reason knowledge capture processes fail in organisations. The motivations of people for capturing corporate knowledge in the City of Perth are to assist the organisation (38%), make their own job easier (38%), make others' jobs easier (34%), for job satisfaction (31%), for self protection (14%), or just because it is part of the process (7%). These motivations were expressed to a greater or lesser extent by different groups of local government workers. The following findings were of particular interest:

- Younger generations are less inclined to capture corporate knowledge simply to assist the local government; possibly because they feel less connected with the organisations they work for.
- The work practices of older generations are often more disciplined and result in the routine capture of corporate knowledge.
- The motivation of self protection is clearly related to people working in positions with higher levels of responsibility and accountability.
- People working in more operational roles can more easily see how capturing corporate knowledge can be of benefit to the organisation than those working in strategic roles.
- The longer a person has been working in the local government the more likely they are to capture knowledge to assist the organisation.

Results showed that the professional backgrounds of people have a significant impact on their motivations for capturing corporate knowledge in local government. The promotion of knowledge capture processes should therefore be targeted and tailored according to people's professional backgrounds. This study found that:

- Self protection is the top motivation for people working in strategic roles.
- Assisting the organisation is the top motivation for people working in customer service roles.
- Job satisfaction is the top motivation for people working in technical roles.
- Making other people's jobs easier is the top motivation for people working in administrative roles.
- Making their own and other people's job easier is the top motivation for people working in creative roles.

While the extent that knowledge is shared in local government would certainly differ from organisation to organisation, there are a number of findings from this study which would be applicable to most local governments. For example, when examining the extent to which people feel knowledge is shared in the organisation, there is often a distinction between pro-active and passive knowledge-sharing activities. Some people share corporate knowledge they have with others without being prompted, while others only share when someone seeks it from them. Sometimes corporate knowledge is not shared well in particular areas of the organisation or between certain groups of people such as supervisors and their staff, the inside and outside workforces, and new and old staff.

People working in local government are faced with a number of barriers that impede the sharing of corporate knowledge. The knowledge-sharing barriers in the City of Perth are based on people (86%), the environment (76%), information (38%), processes (38%), and technology (24%). Some of these barrier types are encountered more often than others and tend to be a

greater or lesser problem for different groups of local government workers. The following findings were of particular interest:

- People and environment based knowledge-sharing barriers are wide spread and affect all groups of local government workers.
- People in lower levels of a local government's structure and those that have worked in the organisation for over 15 years have experienced more barriers when trying to access information.
- People working in strategic roles are less likely to have experienced process-based barriers to knowledge sharing.
- Technology is only a barrier to knowledge sharing for people over 35 years of age.

The finding that people and environment based barriers to knowledge sharing are more prevalent than other types of barriers echoes the views expressed in both the knowledge codification and knowledge transfer literature. Brady and Marshall (2001) describe the socially-situated character of knowledge, and Goh (2002) discusses the need for a culture of 'Cooperation and Collaboration'.

The types of information management processes utilised by people in local government would certainly depend on the policies and systems of their particular organisation. There are, however, some findings from this study which would be of interest to most local governments. In the organisation more people utilised electronic information management processes than physical processes. Likewise, organisational information management processes were used more frequently than personal processes. Both of these patterns have positive implications for the use of knowledge systems in local government.

People working in the City of Perth believe that the purposes for capturing corporate knowledge are to improve the quality of products and services (38%), capture knowledge of retiring staff (28%), improve communication and cooperation (24%), reduce risk exposure (21%), improve decision making (21%), predict and prevent future problems (17%), assist with organisational

learning (17%), reduce duplication of effort (17%), improve management of assets (14%), and improve staff morale (3%). While these reasons for capturing corporate knowledge are certainly discussed in the literature, there are some notable omissions that can probably be attributed to the nature of the local government sector. The codification of knowledge to encourage innovation, and the creation of new knowledge is one such purpose.

Results showed that the professional backgrounds of people also have a significant impact on their view of the purpose of capturing corporate knowledge. This is the same result as the related area of motivations for capturing corporate knowledge, providing further support for the notion that the design and promotion of corporate knowledge capture processes should be tailored according to the professional backgrounds of staff.

A very interesting finding of this study relates to the different views and behaviours of people of different genders. Significant differences between males and females working in local government were discovered in nearly every demographic analysis in this study. The study found that:

- Females utilise a broader range of knowledge types and sources, or they are better at identifying and articulating the types and sources of knowledge they use.
- The top two motivations for capturing knowledge for females were to “assist the organisation” and “make others’ jobs easier”. Both of these selfless reasons for capturing corporate knowledge suggest that females are willing to capture knowledge even if it does not provide them with any specific, personal benefit.
- The top two motivations for males were to “make own job easier” and “job satisfaction”. In contrast to females, their reasons for capturing corporate knowledge are self-serving, indicating that males are more likely to capture corporate knowledge if it provides personal benefit.
- Females tended to have a more positive view on the extent of knowledge sharing indicating that they are more likely to both share their knowledge with colleagues and have others share it with them.

- Females are better at identifying and articulating the various knowledge-sharing barriers they have encountered.

The above differences provide sufficient reason to believe that females make better knowledge workers than their male colleagues.

Throughout this study the attitudes and opinions of people regarding various aspects of knowledge capture have been examined. Although different groups of people often presented divergent views, overall there was a very positive attitude towards the capture of corporate knowledge. When considering what personally motivates people to capture their knowledge people often presented quite altruistic views. When asked why they felt corporate knowledge should be captured, they provided numerous examples regarding how it could help the organisation. This shows that people working in local government seem to genuinely want what is best for the organisation. This may be true of all people or perhaps is particular to people working in the local government sector.

It is clear from this study that people usually prefer to acquire the corporate knowledge they require from inter-personal communication rather than from codified forms of knowledge. Furthermore the literature often argues that knowledge is perhaps something that cannot be captured at all, only shared between individuals. It is therefore very interesting to note that people still recognize the value and importance of knowledge codification processes. There seems to be a general understanding that, although it may be difficult to codify knowledge, it is a very necessary practice in local government. Relying on inter-personal communication for the capture of corporate knowledge in organisations is often impractical, inefficient and ineffective.

The inherent altruism displayed by some of the sampled population and their recognition of the limitations of inter-personal communication as a method of knowledge transfer are perhaps the most surprising findings of this study. The literature might suggest that altruism is a rare commodity in modern organisations and that people have such a preference for inter-personal communication that they are unable to appreciate the benefits of formal

knowledge capture. Since this study suggests otherwise, these ideas might well provide the basis for further research.

While the concept of knowledge capture is by no means a new one, the focus on knowledge management as a discipline and as an essential corporate process within organisations is certainly a development of more recent times. Using a population study approach, this research project has explored methods for capturing corporate knowledge in Australian local government. By identifying and analysing the different types and sources of corporate knowledge that different groups of people use, local governments can develop and promote appropriate knowledge capture methods that will be embraced their workforce. In today's society this is essential, as effectively harnessing the power of an organisation's knowledge is the key towards organisational growth and prosperity.

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APPENDICES

Appendix A – Structured Interviews Invitation Process

The communication process described below was used by the researcher to invite staff from the organisation to participate in the study. This process was developed to ensure that all participants provided their informed consent prior to the interviews and that the university's ethical standards for human research were adhered to.

Firstly, the managers of staff occupying positions at levels equal to or lower than that of the researcher were contacted. A standard e-mail was sent to these managers seeking their permission for selected staff in their area to be involved in the study. A brief description of the study and a copy of the "Participant Information Sheet" were included in the message. The managers were provided the names of the staff from their area selected for the sample and were requested to advise if they consented to them being invited to participate in the study. All managers consented to the involvement of their staff in the study.

Next, a letter was sent to all staff in the sample inviting them to participate in the study. The letter was signed by the Director of Corporate Services and explained that the study was authorised by the organisation, forms part of its Corporate Knowledge Program and was being supervised by Curtin University of Technology. A "Participant Information Sheet" and "Participant Consent Form" were enclosed with the letter. The invitation outlined the purpose of the study, their rights, the activities they may be involved in if they participate, confidentiality and details of the ethics approval. Participants were advised that their participation in this study was voluntary; they were not required to provide reasons for not participating; they could withdraw at any time; they would not be penalised for not participating; and that their manager had agreed to them participating in this study, if they chose to.

The invitation asked staff to read, sign and return the consent forms to the researcher if they wanted to participate in the study. A small number of staff declined the invitation. Substitutes who fitted the demographic targets of the sample were selected. The process described above was repeated for the substitutes until an adequate sample was obtained, as described in Chapter Four: Methodology. The final number of staff in the sample at the end of this process was 29.

A welcome letter was sent by the researcher to staff in the sample once they had returned their consent form. This letter thanked them for agreeing to participate in the study and provided some more details on the interview process. Participants were provided with a short background to the study to provide some context and a list of the questions and prompts that would be used during the interviews. They were also advised that the interviews would be taped and the information obtained from them would be stored securely, treated with confidentiality and that they would not be personally identified in any published results.

Interview invitations were sent to participants using the organisation's electronic calendar system. An electronic copy of the "Participant Information Sheet" and interview questions were attached to the invitation. A time convenient for the participant was scheduled and at least one weeks notice was provided. The interviews were held in either private offices or meeting rooms to provide privacy and prevent interruptions.

Appendix B – Structured Interview Introduction and Questions

While working in your position at the City of Perth you perform functions, undertake activities and participate in business transactions. When you do these things you use your knowledge to help you complete the task. You may have acquired this knowledge through some form of training or education, during your previous experiences, from one of your colleagues or customers, or by accessing and analysing some information.

You will use a combination of different types of knowledge when doing these tasks. Some of the more basic knowledge you use will be general knowledge that you share with many other people around the world. Other knowledge you use will be more specialised that will be related to your particular profession, trade or industry. Another type of knowledge you use will be more specific to the City of Perth, which is what I will call corporate knowledge. This corporate knowledge may be about the things we do (our services), the people we serve (our customers), how we do things (our processes), what we have done before (our history), what we will be doing in the future (our plans), who does what (our organisation) and the contacts we have made (our relationships).

It is possible for at least some of this corporate knowledge to be captured by the City so that it can be shared between staff. Knowledge capture can be thought of as the process of making the knowledge that only exists within an individual's mind into a more explicit form that can be communicated and shared over time. One way this is often done, is by a person analysing the knowledge they have on a particular subject and then transforming that knowledge into pieces of information (such as written text, a diagram or picture, or a recording of sounds and/or images).

During this interview I would like you to consider the variety of tasks that you perform when working in your position at the City of Perth and the types of corporate knowledge that you use when you are doing these tasks.

Question 1

Pick a key task that you regularly perform in your position. Please describe the corporate knowledge that you need to do this task?

Prompt 1A: What do you need to know to be able to do what you do?

Question 2

Where did you acquire this knowledge from?

Prompt 2A: How did you come to know how to do this task?

Prompt 2B: What was the source of this knowledge?

Question 3

Sometimes people get the corporate knowledge that they have and turn it into information that other people can later use. Please describe your experiences with such knowledge capture processes?

Prompt 3A: When have you captured corporate knowledge?

Prompt 3B: When have you used corporate knowledge that others have captured?

Question 4

What do you think usually motivates you to take time to capture the corporate knowledge you have?

Prompt 4A: Why have you captured corporate knowledge in the past?

Question 5

To what extent do you believe that corporate knowledge is shared at the City?

Prompt 5A: Have other staff at the City shared corporate knowledge that they have with you before?

Prompt 5B: Have you shared corporate knowledge with other staff in your team or with staff from other areas?

Question 6

There are often barriers in organisations that prevent the effective sharing of information and knowledge between staff. Please describe some of the barriers that you have come across at the City?

Prompt 6A: Why do you think people do or don't share knowledge at the City?

Prompt 6B: What prevents you from capturing corporate knowledge?

Prompt 6C: How do you think the structure of the organisation or your team affects the sharing of knowledge?

Prompt 6D: How do you think our office layout affects knowledge sharing?

Prompt 6E: What cultural factors do you think affect knowledge sharing at the City?

Question 7

Describe the various information management processes that you regularly use at the City?

Prompt 7A: What systems or procedures do you use that help you to store or access information?

Prompt 7B: How do you store and access files and documents?

Question 8

The capture of the City's corporate knowledge could potentially address a number of issues facing the City. Please describe issues that you think the capture of corporate knowledge could address?

Prompt 8A: What do you think the capture of corporate knowledge is aiming to achieve?

Appendix C – Data Analysis Process

The data analysis process described below was conducted by the researcher utilising the software “N6” produced by QSR International Pty Ltd.

To allow the analysis of responses against demographics, “nodes” were created in “N6” for each of the demographic characteristics of the sample (i.e. Gender, Age, Level of Position, Years of Service and Professional Background). The full text of each interview transcript was then “coded” (linked) to the demographic nodes that corresponded to the demographic profile of the interview participant.

A set of eight top level response “nodes” were created for each topic covered during the structured interviews. Each interview transcript was then read by the researcher. Response nodes were progressively created under the top level topics for each new response provided by participants. Each paragraph of text in the transcript that related to a response node was then coded to the node. A paragraph would typically be coded to more than one response node and sometimes even to nodes under different top level topics. If a response was a subset of an existing node, a child node would be created and thus a hierarchy of related responses was developed. An image of the “N6 Node Explorer” is provided below to illustrate. A total of 226 response nodes were created in the software once all 29 transcripts had been analysed by the researcher.

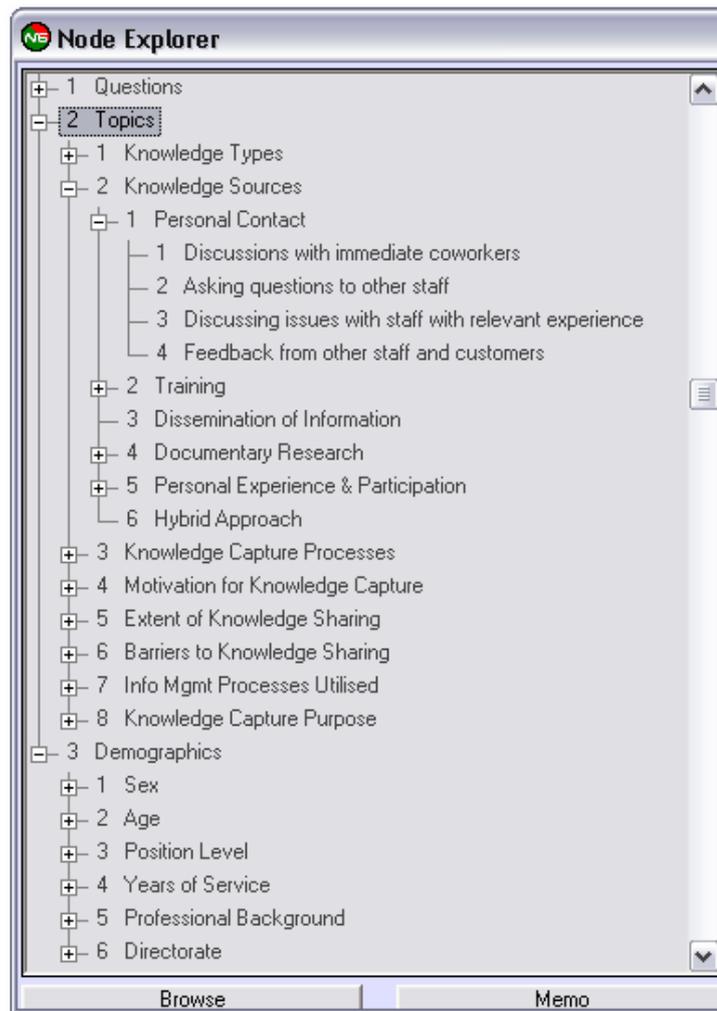


Figure 11: N6 Node Explorer Screen

Once all the transcripts had been analysed and coded, the “Node Search” module of the qualitative data analysis software was utilised to compare all participant responses with their demographics. The software uses Boolean search logic to identify items of text that meet specified criteria. First, “collect” searches were used to group together all responses below specified points in the node hierarchy. Then either “matrix intersect” or “vector intersect” searches were used to find the number of participants within each demographic group that provided a particular response. An image of the “N6 Matrix Viewer” is provided below to illustrate. A total of 137 node searches were conducted to obtain the raw data required for analysis.

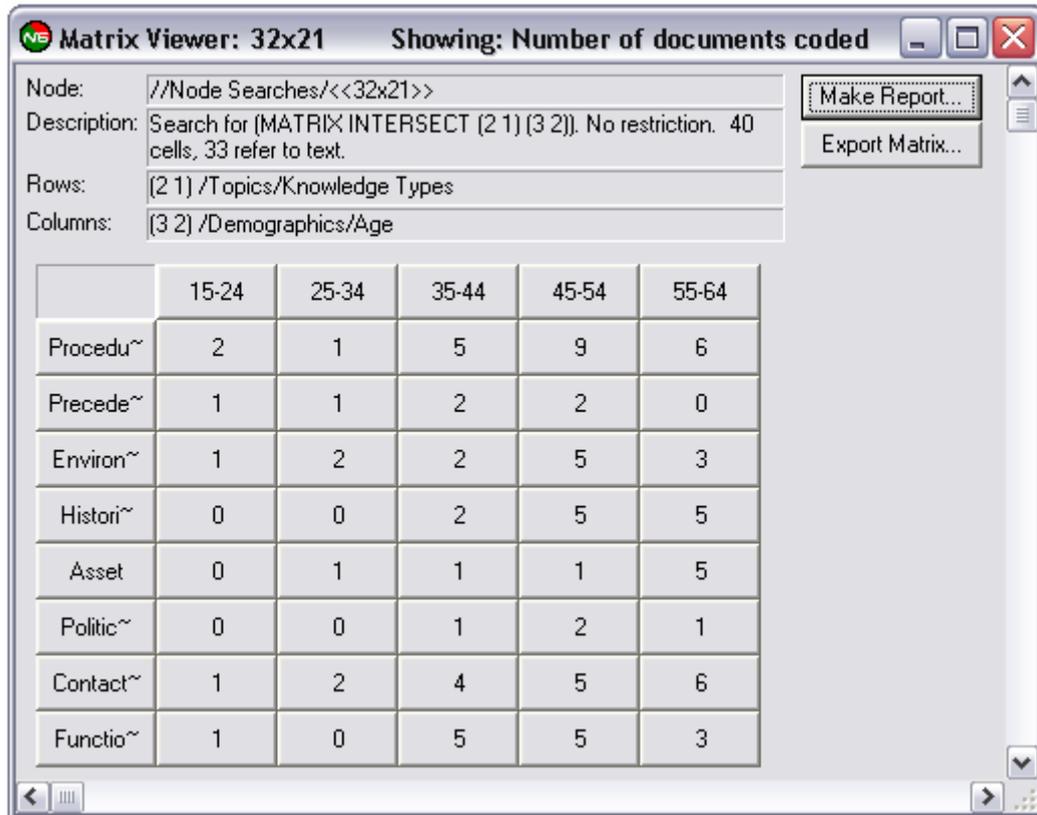


Figure 12: N6 Matrix Viewer Screen

The raw data obtained from each search was then exported from “N6” and imported into a Microsoft Excel spreadsheet for further analysis as described in the Data Analysis section found in Chapter Four: Methodology.