KNOWLEDGE MANAGEMENT INITIATIVES IN THE NEW ZEALAND STATE SECTOR

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Lorraine Hamlin

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Abstract

This research study attempts to determine whether New Zealand State sector organisations do benefit or can benefit from using knowledge management. After considering various approaches taken to developing and implementing knowledge management initiatives, the use of knowledge management in a range of New Zealand State sector organisations is investigated. The practices discovered in each organisation are compared. The positive and negative outcomes experienced from undertaking knowledge management initiatives are discussed. These experiences suggest what similar organisations need to be aware of if contemplating using knowledge management.

The research was a comparative study of several New Zealand State sector organisations that have either implemented or are planning to implement knowledge management initiatives. The research approach was qualitative, and the methodology involved in-depth interviews. These interviews allowed for cross-analysis and comparison across eight different State sector organisations to gain an insight into what has occurred around knowledge management initiatives in each one.

All organisations have gone about developing and implementing knowledge management initiatives in different ways, but all have begun knowledge management work from the common starting point of developing a knowledge management strategy to guide an overall programme of work.

The results of the research indicate that New Zealand State sector organisations have used knowledge management as a change tool, to effect culture changes and staff behaviour changes, and to counteract loss of organisational knowledge.

The key benefits obtained by the organisations that have undertaken knowledge management initiatives have been improving knowledge sharing cultures and environments, and achieving cultural and behavioural changes desired. The critical cornerstones for knowledge management success have been good leadership and buy-in of the knowledge management initiative at chief executive and senior management level.

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SECTION 1 – INTRODUCTION

1.1 Thesis Structure

This thesis is structured into the following sections:

Section 1: Introduction

Section 1 sets out an overall introduction to the matters to be discussed in this thesis. The key components of this section are: providing a background and setting the overall scene for the research undertaken; explaining key concepts which are discussed in more detail throughout the research; and illustrating definitional problems for the terms data, information and knowledge, and introducing working definitions.

Section 2: Literature Review

Section 2 sets out the conclusions and findings of the review of literature in the field undertaken to aid this research study. It begins by providing a background on how knowledge management has arisen. The way in which knowledge is managed in organisations is discussed, including knowledge creation, use, sharing, and transferring, along with the roles of information technology and knowledge management in supporting the management of knowledge in organisations.

Knowledge strategies and knowledge management strategies are then explored, and the role of knowledge management systems outlined. Knowledge management's use in the State sector is then introduced, along with the New Zealand situation regarding knowledge management. This section ends with a summary of key conclusions drawn from the literature review undertaken.

Section 3: Research Methodology

Section 3 sets out the research methodology used in this research study. It begins with a background on the research study's aims and the selection criteria used to choose appropriate organisations. The qualitative research methodology chosen (using in-depth interviews) is then described, along with a précis on why this methodology was selected over other types. Questions used during interviews are then discussed, along with the rationale used to determine question types. The use of an interview guide or questionnaire is also introduced.

The research process undertaken is explained including: contact made with organisations selected; conducting the in-depth interviews; what problems were encountered; and how results collected through the research were analysed.

Section 4: Results

Section 4 sets out the results drawn from the in-depth interviews conducted. It begins with a discussion about the nature of the organisations included in the study. It then explores how the organisations studied view data, information and knowledge. The relationship between knowledge management and strategy is then discussed, along with knowledge management drivers, organisational culture issues and their impact on knowledge management.

The stages and timeframes for knowledge management initiatives in the organisations studied are explored. The storage and use of knowledge and information is then investigated, together with the types of knowledge management systems used in the studied organisations.

The design and implementation of knowledge management systems is examined, and the overall lessons learned by organisations who have implemented knowledge management initiatives are presented.

Section 5: Discussion

Section 5 sets out the discussion regarding the key results and answering the research questions posed. It draws out the overall outcomes of the research undertaken. In particular, it confirms the aims of this research study, and explores definitional findings and key messages about definitions.

Knowledge's use and creation are discussed in terms of what was found through the research study. Then different approaches taken to developing and implementing knowledge management initiatives are explored, along with how New Zealand State sector organisations have used knowledge management initiatives. The lessons learned from knowledge management initiatives that have already been undertaken are determined and discussed in regard to their applicability for other organisations.

Section 6: Conclusion

Section 6 sets out the conclusions to be drawn from this research study. The overall findings and conclusions about what was discovered by conducting this research are presented. In particular, a discussion is included about whether the

results were expected, if the findings differed from previous research held and what new discoveries were made.

1.2 Setting the Scene

Research shows that knowledge management, together with systems and processes used for managing knowledge, are not new ideas. Knowledge is said to have been managed since humans first learned to transfer the skill of making fires (Sveiby, 2001).

However, what has changed in recent years is the significant growth in interest and activity around knowledge management by academics, practitioners, consultants and management writers alike. This has arisen from the convergence of a variety of contemporary ideas, with changing environmental factors. This change has placed emphasis on the role that knowledge can play for organisations, industries and countries. These ideas and themes are explored in more detail in the material that follows.

It has been advocated that knowledge has become a key economic resource of more value than land, capital and labour, the traditional building blocks of an economy. Seen in this light, knowledge is said to play a key role in organisational success. Management writers such as Drucker (1993) have been promoting this view for some time (Ruggles, 1998 and Earl, 2001).

This economic resource view has also given rise to the idea that knowledge societies, or a knowledge age, have been created or have evolved. These environments are often characterised as being staffed by knowledge workers or workforces that are predominantly made up of knowledge workers.

Another trend that has arisen from the economic resource view of knowledge has been for various governments (often in conjunction with industry and academic institutes) to consider how they can encourage the growth of knowledge based economies[1] (Statistics Canada, 2002). Countries such as Ireland, Canada and New Zealand have been exploring how to nurture and grow these economies.

The impact of globalisation in recent years has meant that there is a growing emphasis on international competitiveness, where countries, industries and organisations compete in one worldwide market. This has been a significant move

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[1] Canada's Innovation Strategy, 2002 is in part made up of "Achieving Excellence: Investing in People, Knowledge and Opportunity", which recognises "the need to consider knowledge as a strategic national asset. It focuses on how to strengthen our science and research capacity and on how to ensure that this knowledge contributes to building an innovative economy that benefits all Canadians".

away from previous market conditions where nationally-based markets dominated. The ability to create, use and manage organisational knowledge is likely to become a key factor for competitive advantage in this environment (Grover & Davenport, 2001).

The impact and evolution of telecommunication and technological changes has meant that organisations have been able to create, store, manipulate and use knowledge and information in more diverse ways. This has seen an abundance in the supply of information, but has left organisations with dilemmas about how to manage organisational knowledge and key business information (Grover & Davenport, 2001).

Each of these themes raised are discussed in more detail in Section 2, but when considered together, these influences have focused attention on the role that knowledge has in organisations. Knowledge management has begun to be viewed as one approach to harnessing organisational knowledge's potential value.

The impetus for this research study on considering knowledge management's use in New Zealand-based State sector organisations had two key origins. Firstly, interest in the concept of knowledge-based economies that exist in countries such as Ireland led to questioning what was happening from a New Zealand perspective in terms of knowledge-based activities.

Initial research revealed that, internationally, knowledge management had been in use as a management tool for some time. However, New Zealand is said to be a relatively late adopter of knowledge management given the limited number of New Zealand-based organisations that have either implemented knowledge management initiatives or undertaken some form of knowledge management (Davidson & Voss, 2002). This context provided the stimulus for wanting to find out about what was occurring in New Zealand regarding knowledge management and the uptake of knowledge management initiatives.

Secondly, much of the current research around knowledge management is focussed on private sector organisations; there is little research available about knowledge management's use in public sector organisations. This led to questioning what is the role for knowledge management in the public sector and could public sector organisations benefit from using it?

Initial research also suggested that knowledge is regarded as a key resource and can lead to competitive advantage. However, in the public sector, what often sets public sector organisations apart from others is that they act as monopolies and can command a superior position in terms of organisational knowledge about a given field, area, service or sector. What benefit then could knowledge management have for public sector organisations?

In summary, the impetus for this thesis has arisen from these two sources: researching knowledge-based economies like Ireland, and finding that there is relatively little knowledge management literature focused on the public sector.

1.3 Research Objectives

The key goal and objective of this thesis is to examine the role that knowledge management plays in New Zealand State sector organisations to ascertain if they could potentially gain advantages from adopting knowledge management. A secondary goal was to discover how New Zealand State sector organisations benefit from using knowledge management.

To reach the stated goals and objectives of this thesis, the following framework was adopted to guide supporting research:

- Considering how knowledge is created and used generally in organisations.
- Investigating different approaches to developing and implementing knowledge management initiatives.
- Investigating the use of knowledge management in a range of New Zealand State sector organisations.
- Assessing whether or not New Zealand State sector organisations can learn from the development and implementation of knowledge management initiatives that have already been undertaken in the State sector.

The aim of this thesis is to examine the role that knowledge management could potentially play in public sector organisations in New Zealand. Given that the New Zealand public sector is made up of several large components including State sector organisations (such as government agencies), crown entities (such as universities and district health boards), and local government organisations (such as territorial and local authorities), and that the current Government is looking towards this sector driving its goals towards creating a knowledge-based economy, it was decided to limit this research to the study of State sector organisations.

1.4 Key Concepts

1.4.1 Introduction

Before exploring knowledge management and its potential role in organisations in this thesis, it became apparent that the first step needed was to consider what knowledge is, and also how it relates to the concepts of information and data. These issues raise a number of complex issues, which pose significant research problems.

In particular, there is no single agreed definition or understanding of what constitutes data, or information or knowledge. Indeed, there is debate about whether data, information and knowledge in themselves represent similar concepts and ideas, or are independent and have no bearing on one another. It is suggested by knowledge management writers such as Grover & Davenport (2001) that data, information and knowledge form a progression or hierarchy of linked concepts.

1.4.2 Data

The New Oxford Dictionary of English (1998) defines data as "facts and statistics collected together for reference or analysis". The Collins Dictionary (1985) defines data as "a series of observations, measurements or facts". In this sense, data can be seen as a group of facts.

Davenport & Prusak (1998) describe data as "discrete, objective, facts about events". Data in this form is viewed as basic material, which does not carry any context or purpose outside of a given event.

For the purposes of this thesis, the working definition of data is:

> "Objective facts or records about an event."

This view is taken because data is seen as a group of facts or records, which provide a limited story about a given event. In this regard, data elements usually need to be shaped or analysed by users in order to be meaningful or to become part of a series for comparison or contrast. A single data element may not have much value when viewed alone.

The working definition of data put forward recognises that data relates to a limited group of messages about a given event. Data is often grouped in a series or clustered around rudimentary categories. In this form it is the raw material that with shaping becomes information.

1.4.3 Information

Many management writers and researchers view information as being data that has been transformed or significantly altered by being coupled with some form of meaning or context for its user (Drucker, 1992, Nonaka & Takeuchi, 1995 and Von Krogh, Ichijo & Nonaka, 2000). Examples of key working definitions of information are:

> "Information is data endowed with relevance and purpose. A company must decide what information it needs to operate its affairs, otherwise it will drown in data." (Drucker, 1992:329)

> "Information provides a new point of view for interpreting events or objectives, which makes visible previously invisible meanings or sheds light on unexpected connections." (Nonaka & Takeuchi, 1995:58)

> "Information is data put in context; it is related to other pieces of data." (Von Krogh, Ichijo & Nonaka, 2000:27)

The working definition for information used in this thesis is:

> "Data which has relevance, purpose and context added to it."

This working definition of information again reflects that some sort of adaptation or conversion process has gone on to change data into information. The key cause of this conversion, which takes data or events or objects and turns them into information, is the addition of both purpose and context. By providing a meaningful purpose and context to data, it becomes information.

This transformation of data is also aided by having relevance added to it. This means that data becomes relevant for its recipient.

Nonaka & Takeuchi (1995) and Von Krogh, Ichijo & Nonaka (2000) view information as a necessary building block or basis for forming knowledge. By processing data through adding context, purpose and relevance, information can then in turn become more easily converted into knowledge.

1.4.4 Distinguishing Information from Knowledge

Management writers like Senge (1997), Sveiby (1997), Stewart (2001) and Nonaka & Takeuchi (1995) point to the difficulty in distinguishing information from knowledge. This has arisen as there has been a blurring of the boundaries between information and knowledge.

The difficulty in spotting the difference between knowledge and information is illustrated below by these management writers:

> "We use the words knowledge and information virtually synonymously and for us there is no sharp distinction between the two." (Senge, 1997:136)
>
> "Knowledge and information are often confused with each other. In the information technology industry they are used as synonyms." (Sveiby, 1997:40)
>
> "It is impossible however, to make a clear distinction between information and knowledge that works for a very large group. This is because one man's data can be another man's knowledge and vice versa, depending on context. Your deep expertise in accounting, metallurgy or literature may be an interesting tidbit to the person sitting next to you at dinner tonight. Therefore what's information and what's knowledge depends on context." (Stewart, 2001:6)

One helpful way of distinguishing the difference between information and knowledge is to examine how they both are used. Information sharing and knowledge sharing are considered to be different actions (Senge, 1997, McDermott, 1999 and Sveiby, 1997). In particular, Senge (1997) points to this as a distinction between knowing about things, and knowing how to do things. He sees information sharing as:

> "Giving people something or getting something from them. Whereas sharing knowledge occurs when people are genuinely interested in helping one another develop new capacity for action; it is about creating learning processes." (Senge, 1997:137)

Nonaka & Takeuchi (1995) consider that knowledge is different and distinct from information, as it concerns beliefs and commitment (which are anchored in individual's value systems), which information doesn't include; it is centred on action; and it has some form of meaning, which gives it context.

1.4.5 Knowledge

The question of what is knowledge has puzzled humans since the time of the ancient Greek philosophers such as Plato. Various management writers emphasise that this issue continues to remain current (Drucker, 1992, Grover & Davenport, 2001 and Sveiby, 1997).

Philosophers throughout history have also grappled with related ideas about what it is to know something or to think, and how it is that humans are able to acquire knowledge. Modern philosophy refers to these questions about the human understanding of knowledge as epistemology (Robinson & Groves, 1998).

Recent philosophers including Polanyi have continued to wrestle with this question of "what is knowledge?" and "what does it consist of?" (Drucker, 1992 and Sveiby, 1997). Polanyi (1966) was the first modern day philosopher to advocate that knowledge consists of two distinct elements; tacit knowledge and explicit knowledge.

Management writers Nonaka & Takeuchi (1995) have taken Polanyi's ideas about tacit knowledge and explicit knowledge and expanded them, as discussed below.

- **Tacit Knowledge**

  Tacit knowledge is personalised and context based, and therefore difficult to articulate and formalise (Nonaka & Takeuchi, 1995). Tacit knowledge is also knowledge that resides in people's minds making it largely intangible.

  Tacit knowledge is also said to include skills and experience (McCune, 1999 and Markus, 2001). It can also pass from one individual or group to another (McCune, 1999 and Markus, 2001) through knowledge sharing techniques.

- **Explicit Knowledge**

  Explicit knowledge is knowledge that has been captured, articulated, and codified ie, documented, structured, disseminated and transmitted (Nonaka & Takeuchi, 1995). Organisations can gain relatively easy access to explicit knowledge and promote sharing it.

  Explicit knowledge is also represented in tangible assets such as patents, licences and known information on customers, suppliers and competitors (McCune, 1999 and Markus, 2001).

Like Nonaka & Takeuchi (1995), Von Krogh, Ichijo & Nonaka (2000:6) consider that knowledge can take both explicit and tacit forms and that "knowledge is justified true belief".

Knowledge management writers also draw a wide interpretation about the question of what knowledge consists of. Key working definitions of knowledge prepared by knowledge management writers are given below.

> "Knowledge is information combined with experience, context, interpretation, and reflection. It is a high value form of information that is ready to apply to decisions and actions." (Davenport, de Long & Beers, 1998:43)

> "Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organisations, it often becomes embedded not only in documents or repositories but also in organisational routines, processes, practices and norms." (Davenport & Prusak, 1998:5)

> "Knowledge is the most valuable form of content in a continuum starting at data, encompassing information, and ending at knowledge." (Grover & Davenport, 2001:6)

These working definitions provide some useful signposts to help clarify what is knowledge. In particular, the working definitions prepared by Davenport, de Long & Beers (1998) and Davenport & Prusak (1998) indicate knowledge consists of information that is enhanced with experience and context, which enables someone to take action. This is seen as significant. It is this ability to give someone both a context and material they can act on that sets knowledge apart from information.

The view expressed by Grover & Davenport (2001) that knowledge forms part of an overall data, information and knowledge continuum, also gives a useful insight into how these concepts are linked. It is considered that there is a relationship between these three terms, represented by a progression or refinement of data into information, which in turn is processed into knowledge.

For the purposes of this study, the following working definition for knowledge was originally used when the research began:

> "Knowledge is information that has been fused and blended with understanding, awareness, context, purpose and expertise that enables someone to take action."

This working definition draws from the ideas of Davenport, de Long & Beers (1998) as it represents the concept that information is changed and processed by having extra dimensions like understanding, awareness, context, purpose and expertise packed into it. This can then be utilised by its recipient to allow for some form of action to take place, which is seen as a key element of knowledge.

One of the key elements of the working definitions of knowledge offered by Davenport, de Long & Beers (1998), Davenport & Prusak (1998) and Grover and Davenport (2001) is the premise that, at its centre, knowledge consists of information which as been altered through some sort of conversion process.

Along with providing context and purpose, others' experience, values and interpretations are melded together with information to give a package of material that someone else can act on (Davenport, de Long & Beers, 1998 and Davenport & Prusak, 1998). This interpretation of what knowledge consists of echoes the ideas of Nonaka & Takeuchi (1995) who consider that knowledge is different and distinct from information, as it concerns beliefs and commitment (which are anchored in individual's value systems), which information doesn't include, it is centred on action, and it has some form of meaning which gives it context.

It also resounds with Nonaka, Toyama & Nagata (2000) who believe that knowledge is context specific and that, without having a context, knowledge is information only, and Von Krogh, Ichijo & Nonaka (2000) who also agree that the effective creation of knowledge relies on a context being provided. Furthermore, Nonaka, Toyama & Nagata (2000) consider that knowledge is dynamic and human based, and the product of interventions between people.

The proposed working definition of knowledge incorporates these ideas discussed above. It is essentially about sharing experiences with others within a bounded context to arm them in performing an action.

However, it became necessary to further refine this working definition when more detailed research had taken place (ie, after in-depth interviews had been held in field research) and a clearer view of knowledge had been formed from this research in the field. This is explained in more detail in Sections 3 and 5, but the updated working definition of knowledge became:

"Knowledge is information that has been fused and blended with experience, understanding, awareness, context, purpose and expertise that enables someone to take action."

1.4.6 Knowledge Management

Just as there is a wide range of views about how knowledge is defined, there is a similarly broad range of views about how knowledge management should be defined. Although the term knowledge management is relatively new, some management writers believe that managing knowledge is not a new concept (Sveiby, 2001 and Hansen, Nohria & Tierney, 1999). This point of view is expanded on in section 2.2.2.

Davenport & Prusak (1998) use the following working definition to describe what knowledge management is:

"An effort to capture explicit information and tacit information and knowledge that exists in an organisation, and in the minds of employees, in order to advance the organisation's mission."

Other key working definitions are:

"Knowledge management is a systematic and organisationally specified process for acquiring, organising and communicating both tacit and explicit knowledge of employees so that other employees may make more use of it to be more effective and productive in their work." Alavi & Leidner (1997:7).

"Knowledge management is about applying the knowledge assets available to your organisation to create competitive advantage." Davidson & Voss (2002:32).

The working definitions presented by Davenport & Prusak (1998), Davidson & Voss (2002) and Alavi & Leidner (1997) are important, as they describe the core elements of knowledge that is captured in organisations to aid the organisation or its staff. This is the core of knowledge management.

For the purposes of this thesis, knowledge management is defined as:

"The systematic process of capturing organisational knowledge, and the sharing of this to aid achievement of organisational aims and objectives."

Knowledge management can aid the capture of explicit knowledge and also aid the shaping and sharing of tacit knowledge, by providing enabling systems and processes. By providing these knowledge-enabling systems and processes, the access, storage and transmission of knowledge within organisations is aided. This greater access and sharing of knowledge can lead to organisations driving competitive advantage or achieving organisational aims and objectives by using knowledge to advantage.

SECTION 2 – LITERATURE REVIEW

2.1 Introduction

Management writers and commentators such as Drucker (1993 & 1995), Davenport, de Long & Beers (1998) and Stewart (1997) have been speculating for some time that knowledge (and organisational knowledge particularly) has become more significant for organisations in recent years. In particular, Davenport, de Long & Beers (1998:43) suggest that some kind of economic transformation has taken place, which has knowledge at its centre.

It has been advocated that knowledge has become a key resource for economies and individuals alike (Drucker, 1995:68 & 71) and that all organisations need to learn how to maximise the value of their knowledge. When seen in this light, knowledge is said to have greater value than the traditional economic resources of land, capital and labour (Stewart, (1997:x).

This situation poses challenges for organisations: if organisational knowledge is as important as it is suggested, how should organisations promote and enable knowledge creation, sharing and use to maximise its value? It also raises questions about organisations' ability to physically manage organisational knowledge and gain access to it, given its tacit and explicit characteristics and intrinsic link to people.

Knowledge management provides some options around the sharing and use of organisational knowledge. At its core, knowledge management is about aiding and supporting knowledge-related processes such as knowledge creation, acquisition, sharing and transfer within organisations. However it can be difficult to implement knowledge management successfully.

So, in order to answer the central research question and determine whether knowledge management has an overall benefit for organisations, (including those from the New Zealand State sector), a review of literature in the field has been undertaken which is presented in this section.

The starting point for this work was to ascertain what research has been previously conducted in this field, and to consider significant findings by other researchers. This initial exploration provided a conceptual framework that guided later research into knowledge management's use in New Zealand State sector organisations.

The literature review was undertaken to:

- Explore the evolution and development of knowledge management.
- Consider how knowledge is created and used in organisations.
- Investigate the development of knowledge management strategies, and examine the part they play in implementing knowledge management initiatives.
- Consider the form and role of knowledge management systems, and how they assist in the development and implementation of knowledge management initiatives.
- Investigate the use of knowledge management in the State sector, to initially determine what part knowledge management can play in State sector agencies.
- Explore knowledge management initiatives being undertaken in New Zealand State sector organisations.
- Determine the gaps in current literature in the field regarding understanding about knowledge management and to explore where further research ought to be undertaken.

2.2 Emergence of Knowledge Management

2.2.1 The New Environment

As highlighted in the previous section, managing knowledge is not a new concept for organisations to consider. It has been said that organisations cannot survive without creating, acquiring, using and sharing knowledge (Hansen, Nohria & Tierney, 1999, the OECD, 2001 and Sveiby, 2001).

However, knowledge and behaviours associated with effectively using it (Marchand, Kettinger and Rollins, 2000) have increasingly become recognised as strategic assets (Davenport & Prusak, 1998), which can be key factors that set one organisation apart from others and give some form of advantage.

Many management writers believe that knowledge has become a key economic resource and the dominant (Ruggles, 1998) source of competitive advantage. These writers include Stewart (1997), Harris (2001), Drucker (1993 & 1995), Arthur (1994), Earl & Scott (1999), along with international research bodies like the OECD (1996).

Management writers have also been alluding to the emergence of a new environment or era that places emphasis on intellectual capital (Stewart, 1999) or knowledge (Sveiby, 1997). Some see this as the third wave (Tofler, 1980), others think of it as the information society (Applegate, Austin & McFarlan, 1999, Earl, 2000 and Masuda, 1980) or the knowledge society (Masuda, 1980, Naisbitt, 1982, and Drucker, 1993, 1994 and 1998).

However, there is debate about how these concepts differ and about their usefulness. Some terms used to describe the new environment appear to be in direct contradiction to others. For example, it could be argued that the knowledge society is superior to the information society, if the theory that knowledge is superior to information is believed.

What is important about this new environment is that the creation, storage, sharing and use of organisational knowledge have taken on added significance in organisations. The ways in which organisational knowledge is created, transferred and used in organisations is explored in Section 2.3. As organisational knowledge becomes more valued in organisations, being able to use it in new ways that aid the achievement of organisational aims and goals is likely to be a driver for organisational success.

An allied concept to the idea of a knowledge society is the advent of the knowledge worker. Again there is wide debate about what the definition of a knowledge worker should be. However, most management writers and researchers would agree that knowledge workers are defined by the type of work that they do, in manipulating knowledge to meet organisational demands or objectives (Scarbrough, 1999 and Sveiby, 2001).

One of the changes caused by the new emphasis on organisational knowledge has been the advent of more mobile workforces, moving between organisations as their skills and personal knowledge have become increasingly portable, and market forces have created favourable conditions to support this movement between organisations.

In the local context this has been evidenced by the significant growth in the number of independent contractors who are often highly skilled individuals that move between organisations, working on short-term assignments and projects. This mobility has particular importance for organisations; staff have become a lot less loyal and dependent on one organisation for long-term employment (Scharmer, 2001). They can also transport their knowledge and skills relatively freely.

The emergence of the knowledge society and knowledge workers is likely to have significant impact on organisations. Organisations will probably have to compete more for knowledge assets (or those areas of knowledge or information that are key to providing competitive advantage) and knowledge workers. This will have a knock on effect on knowledge acquisition, creation, transfer and sharing processes, to ensure that they can maximise the value of organisational knowledge.

The rise of the knowledge worker will mean that workforces will take on more competencies and skills around organisational knowledge processes including acquisition, analysis, shaping and application of knowledge. This is likely to create a situation where organisations will actively compete for skilled knowledge manipulators and users.

2.2.2 Evolution of IT Systems and Knowledge Management

One of the drivers for the rise in knowledge management's use has been the evolution of information technology (IT). In this regard it is useful to consider how IT systems have themselves evolved.

When organisations began to computerise in the 1950s, the first IT systems were designed to facilitate data collection and to improve the efficiencies of organisational transactions (Somogyi & Galliers, 1999 and Leidner, 1999).

By condensing information obtained from these transactional processing systems and presenting it to managers, management information systems (MIS) were formed (Leidner, 1999). Eventually the need for data cross-referencing led to the development of data management systems and corporate databases in the late 1960s (Somogyi & Galliers, 1999).

It has been suggested that the role of computers (and particularly PCs) in supporting decision making led to the development of decision support systems (DSS) (Somogyi & Galliers, 1999). In contrast, it is also held that DSS and executive information systems (EIS) evolved from the need to provide specific on-line information for decision makers, presented in a flexible format (Leidner, 1999).

Web-based technologies have emerged which compensate for the limitations of EIS, regarding the difficulty of integrating information across platforms (Leidner, 1999). These are knowledge management systems that provide (for the first time) the ability to pull hardware (ie, computers), software, and databases into a single system, to enable staff to find knowledge and information wherever it resides (Cortese, 1996).

These changes to IT systems have also influenced the evolution of knowledge management. Knowledge management has been developed in a series of distinct waves or stages allied to the growth of IT systems (Prusak, 2002, Sveiby, 2001 and Davenport, 1999):

- **Stage One –** Covering the period from 1989 to 1993

  The first wave of knowledge management initiatives was centred on the re-branding of information management (Prusak, 2002) and on initiatives which began to locate and capture knowledge (Scharmer, 2001). This stage was inward looking, focusing on technical systems in organisations (Sveiby, 2001 and Scharmer, 2001).

  Stage One development of knowledge management can be categorised as organisations managing knowledge and information in a similar fashion to physical assets or objects, which didn't materially differ from information management. This led to knowledge and information being stored in documents, data warehouses and repositories (Sveiby, 2001, Prusak, 2002, and Grover & Davenport, 2001).

  This period can be characterised as having an overall theme of the "silver bullet" approach to knowledge management, where having an IT system for managing

knowledge and information was seen as an instant solution to a range of problems (Prusak, 2002).

- **Stage Two –** Covering the period from 1994 to 1998

  The second wave of knowledge management centred on individuals using IT systems to connect to each other, and to share and transfer knowledge (Scharmer, 2001). It saw a growth in ideas about knowledge capital or intellectual capital. This stage was dominated by technology providers such as Lotus and Microsoft (Prusak, 2002) and IT tools.

  Stage Two was similar to the first stage, but focused more on areas like leveraging knowledge about customers (to give them better service) through systems such as data warehouses (Sveiby, 2001), along with generally looking at what motivates people to share knowledge (Scharmer, 2001).

  This period can be characterised as having an overall theme of "technological utopia", where the view was taken that having the right technology would lead organisations to reach nirvana (Prusak, 2002).

- **Stage Three** – Covering the period from 1998 to the present day

  The third stage of knowledge management's evolution has centred and had significant emphasis on communities of practice (refer to Section 2.3.4 which includes a discussion about communities of practice), the interaction of groups and an overall social approach. It has recognised that knowledge is governed by social processes, and that technology can only act as an enabler (Prusak, 2002). Dominant in this stage, was interaction between people (Sveiby, 2001) in order to create new knowledge (Scharmer, 2001).

  This period can be characterised as having an overall theme of "communities of practice and networks of practice" (Prusak, 2002), where the social processes around people's interaction have been recognised.

  Other knowledge management initiatives undertaken by organisations at this stage included establishing employee networks, nurturing communities of practice, and trying to encourage knowledge and information sharing. Management writers such as Von Krogh (Scharmer, 2001) and Davenport have found that in this stage organisations soon discovered that successfully using knowledge for competitive advantage meant changing many core aspects of the organisation (Davenport, 1999), (Davenport and Glaser, 2002) and (Grover &

Davenport, 2001) and focusing more attention on organisational structures and processes (Scharmer, 2001).

This overall evolution has highlighted that the traditional structure of organisations doesn't ideally allow for knowledge sharing and creation (Prusak, 2002). A new stage for knowledge management is currently emerging:

- **Stage Four** – Covering the present day to the future

  The fourth stage of knowledge management is said to centre on the embedding and embodying of knowledge (Prusak, 2002) and "baking specialised knowledge[2] into the jobs of highly skilled workers – to make the knowledge so readily accessible that it won't be avoided" (Davenport and Glaser, 2002:6). This stage is based around the realisation that the key to unlocking the value of knowledge is understanding people and the way they share knowledge (Sveiby, 2001).

The evolution of IT systems and the growth in knowledge management reflects the changes that have occurred, as emphasis has moved over time in turn from data, to information, and to knowledge. Knowledge management systems have also had to become increasingly flexible to deliver a variety of results to wide-ranging target audiences.

Future developments in IT systems and knowledge management are likely to draw on the current need for flexibility and system integration. This will create challenges in terms of ensuring system stability and security for organisational knowledge assets.

2.2.3 Findings Regarding Background on Knowledge Management

There are some important messages to be distilled from knowledge management's history and overall development. These are discussed below.

Organisational knowledge is said to have become a key resource, particularly for organisations, and is likely to take on added significance and value in the future. In

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[2] Davenport & Glaser (2002) suggest that the most successful way of baking knowledge into jobs or embodying it is to embed it in the technology that knowledge workers use every day to carry out their jobs. In this fashion, knowledge would be delivered on a just-in-time basis for critical work processes (Davenport and Glaser, 2002).

this regard, organisations need to ensure that processes covering organisational knowledge's acquisition, creation, sharing and use maximise the value of organisational knowledge and its potential to aid competitive advantage or organisational success.

The rise of knowledge workers means that organisations will increasingly be staffed by well-educated, highly-skilled knowledge manipulators, who will present challenges in terms of retention, reward and motivation.

With the increasing blurring of boundaries between what has traditionally been regarded as individual professions and new knowledge generalists, such as call-centre staff, there is going to be a demand for skilled organisational knowledge creators, users and manipulators. Organisations are likely to have to compete more for knowledge workers in a competitive market.

There has been a sharp movement away from looking at IT systems as the answer to managing organisational knowledge, to focusing on the importance of people. There is also a growing awareness that knowledge creation and knowledge sharing are socially interactive processes within organisations.

2.3 Managing Knowledge in Organisations

2.3.1 Introduction

Before considering ideas about knowledge management in more detail, it is useful to consider the role of knowledge in organisations, and more particularly, how organisational knowledge is created, used, transferred and shared in organisations.

It is suggested that, although knowledge is now seen as an economic commodity, the way organisations create and manage organisational knowledge is yet to be readily understood (Nonaka, Toyama & Nagata, 2000). In addition, it is held that, while the recent interest in organisational competencies has focused on knowledge deeply rooted in organisations, there has only been a limited exploration of what organisational knowledge consists of and how it is created, and then transferred both within and outside of organisations. This is, in part, due to the difficulties around identifying and measuring organisational knowledge (Spender & Grant, 1996).

A more detailed discussion about how organisational knowledge is created in organisations through knowledge conversion processes is included in this section. In particular, the ideas advocated by Nonaka & Takeuchi (1995) along with Nonaka, Toyama & Nagata (2000) about organisational knowledge processes are outlined and discussed.

This section also introduces the concept that organisational knowledge cannot be created by organisations per se: as it is inherently bound to humans and social processes undertaken by people. It is the social interaction between people within an organisation that leads to the creation of new organisational knowledge.

2.3.2 Knowledge Creation in Organisations

As discussed in Section 1, knowledge is said to consist of tacit and explicit components (Nonaka & Takeuchi, 1995 and Polanyi, 1966) which are complementary forms. Furthermore, new organisational knowledge is created in organisations through the social interaction between individuals (Nonaka, Toyama & Nagata, 2000), and between individuals reacting to their environments (Nonaka & Takeuchi, 1995), and through interaction between individuals' tacit and explicit knowledge, using knowledge conversion processes (Nonaka & Takeuchi, 1995).

New organisational knowledge is also said to be created in organisations when individuals interact together and move beyond their individual boundaries, changing

each other's knowledge and the surrounding environment (Nonaka, Toyama & Nagata, 2000). These circumstances suggest that knowledge creation is also a social, human-based process that justifies personal belief (Nonaka, Toyama & Nagata, 2000 and Nonaka & Takeuchi, 1995).

As knowledge focuses on human activities and actions, a lack of understanding of people and their social interactions causes a lack of understanding and awareness of the processes around knowledge creation in organisations (Nonaka, Toyama & Nagata, 2000 and Nonaka & Takeuchi, 1995). Organisations need to provide the location, environment and context for this knowledge socialisation to occur. They also need to be aware of these socially-based processes.

Furthermore, in this context, organisations have to have an appreciation and awareness of how these processes work in order to understand how knowledge is created and used. Before organisational knowledge can be captured or shaped, it has to be created within organisations through social processes. This is an important point given that knowledge management writers like Davenport & Prusak (1998) suggest that knowledge management is designed to focus on the capture of knowledge that exists in organisations. Without knowing how organisational knowledge is formed, knowledge management work aimed at capturing organisational knowledge may not be successful.

Knowledge creation is seen as a continual process within organisations (Nonaka, Toyama & Nagata, 2000 and Davenport, 1998). Knowledge-creating organisations are said to perpetually make new knowledge from exiting organisational capability using knowledge creation processes, rather than having knowledge stocks available through things like IT systems (Nonaka, Toyama & Nagata, 2000).

This means that organisations largely draw on their existing knowledge stocks to create organisational knowledge. They are therefore likely to need methods, tools and processes to assist with organisational knowledge creation.

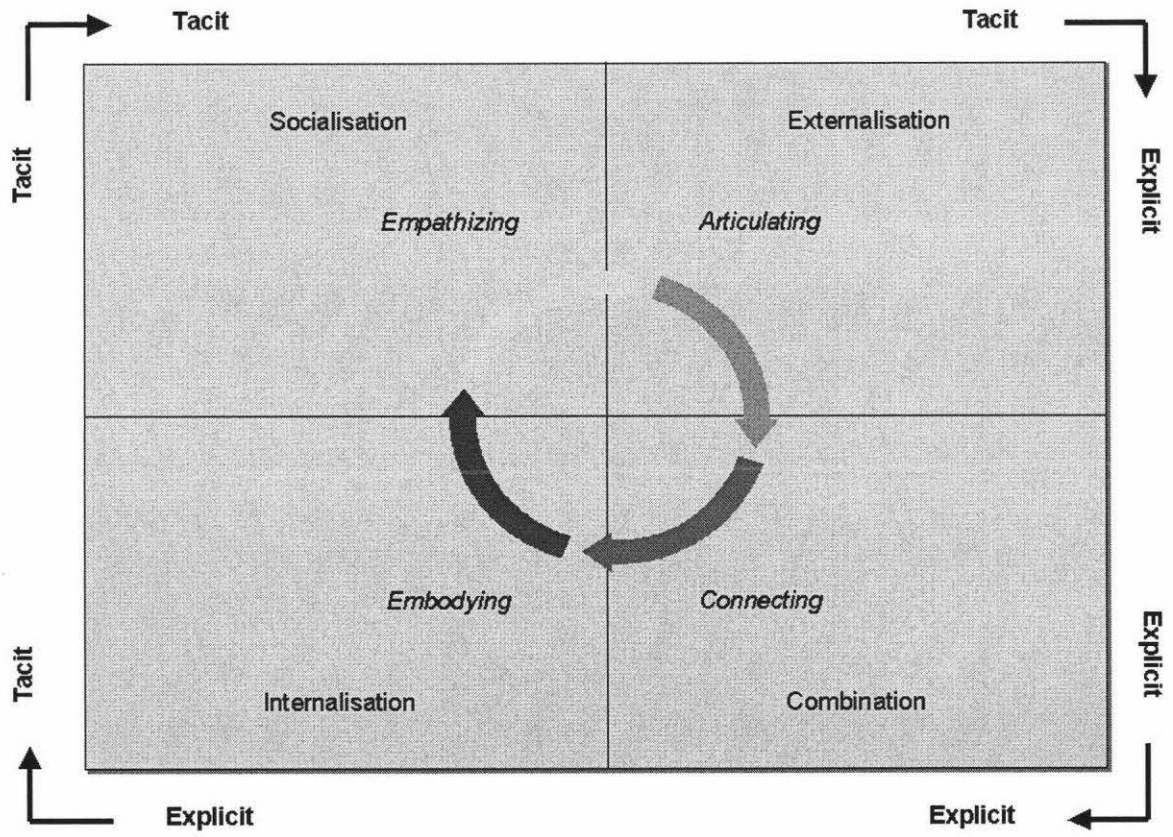
The actual process of knowledge creation in organisations is said to occur in a spiral pattern, which is created in organisations through a knowledge conversation process, which begins with the *socialisation* of knowledge, moves through to *externalisation* of knowledge, then knowledge *combination* and finally knowledge *internalisation* (Nonaka & Takeuchi, 1995 and Nonaka, Toyama & Nagata, 2000).

This knowledge creation process is known as SECI (knowledge socialisation, externalisation, combination and internalisation) and has the following characteristics of:

- **Socialisation** – relates to the conversion of tacit knowledge from one individual to tacit knowledge of another through shared experiences and empathy.
- **Externalisation** – refers to the conversion of tacit knowledge to explicit knowledge through articulation.
- **Combination** – is the conversion of explicit knowledge to explicit knowledge by connection and exchange between individuals.
- **Internalisation** – refers to the conversion of explicit knowledge to tacit knowledge through the embodiment and absorption of knowledge.

Thus, the knowledge creation spiral begins at an individual level and moves through expanding communities of practice, both within and outside of an organisation (Nonaka & Takeuchi, 1995). The overall SECI process discussed above is shown in Figure 1 which follows.

Figure 1 - Nonaka, Toyama & Nagata's Adaptation of Nonaka & Takeuchi's SECI Process



Source: Nonaka, I., Toyama, R. & Nagata, A. (2000). A firm as a knowledge-creating entity: a new perspective on the theory of the firm, *Industrial and Corporate Change*, 9(1), 1-20.

This knowledge creation process is based on the fundamental assumptions that only individuals can create knowledge; ie, organisations cannot create knowledge themselves, and that organisational knowledge creation processes occur when knowledge created by individuals is amplified by the social interaction between individuals (Nonaka & Takeuchi, 1995).

Organisations need to provide infrastructures and processes (such as SECI) that encourage this creation of knowledge initially by individuals, and then by groups and communities of practice. In order to achieve this, organisations need to have an awareness of the nature of the knowledge conversion process and its reliance on people. Organisations also need to understand what it is that drives the creation of knowledge.

The key influences that drive the SECI knowledge spiral are said to be:

- Organisational intent or having a knowledge strategy, which provides the vehicle for knowledge creation, acquisition, accumulation and exploitation.
- Autonomy for individuals and teams to act independently (where appropriate).
- Allowing for flux and creative chaos to stimulate questioning behaviours and reflective action by individuals.
- Providing information that intentionally overlaps with existing knowledge about business functions and the organisation to promote the sharing of tacit knowledge.
- Providing diversity and organisational shapes and structures that are diverse enough to deal with the variety and complexity of the external environment (Nonaka & Takeuchi, 1995 and Nonaka, Toyama & Nagata, 2000).

These knowledge spiral drivers provide the parameters and infrastructures that explain how knowledge creation processes can be accommodated and encouraged within organisations. However, organisations may be unwilling or unable to alter their structures and cultural norms to allow for such knowledge spiral drivers as flux and chaos and autonomy for individuals.

But without taking these conditions and knowledge drivers into account, organisations may lose the benefits of stimulating organisational knowledge creation or limit the extent to which new organisational knowledge can be created.

In addition to the SECI knowledge conversion process outlined above, a five phased knowledge creation process is also said to operate in organisations (Nonaka & Takeuchi, 1995) which consists of:

- Sharing tacit knowledge among multiple individuals.
- Creating concepts by sharing tacit mental models between groups or teams of individuals, and creating new explicit concepts from these.
- Justifying new concepts formed to determine if they are valid for the organisation to pursue.
- Converting the justified concept into an archetype or prototype to model for products or operating mechanism like a new strategy, a new process or a new organisational structure.
- Allowing the new concept to move to a new cycle of knowledge creation at another level, where it can either stay within the organisation or move onto other organisations such as customers, suppliers or competitors of the original company.

The rate in which knowledge is converted using this process in organisations is heavily influenced by: the vision for knowledge use in the organisation; the organisation's structure; reward systems used within the organisation to promote knowledge sharing; organisational culture and norms; together with leadership (Nonaka, Toyama & Nagata, 2000). These ideas are explored further in Sections 2.3.4 and 2.3.5.

The knowledge-creation processes expounded by Nonaka & Takeuchi (1995), are further expanded by Von Krogh, Ichijo & Nonaka (2000). They begin with Nonaka & Takeuchi's ideas there are five key parts to the knowledge creation process: sharing tacit knowledge; creating concepts; justifying concepts; building a prototype and cross-levelling knowledge. However, they considered that the knowledge-creation process posited by Nonaka & Takeuchi (1995) is dependent on a knowledge-enabling context being provided within organisations (Von Krogh, Ichijo & Nonaka, 2000).

What this refers to is providing the location and space for supporting knowledge creation. This is considered to be an important part of the knowledge-creation process.

In particular, organisational knowledge is said to be context specific and without having a context, knowledge is considered to be information only (Nonaka, Toyama & Nagata, 2000). Furthermore, knowledge-creating processes have to be context specific in regard to who can participate in them (Nonaka, Toyama & Nagata, 2000).

This shared organisational context where knowledge is created, shared and utilised as seen as important (Nonaka, Toyama & Nagata, 2000). This place (Von Krogh, Ichijo & Nonaka, 2000) or context (Nonaka, Toyama & Nagata, 2000) is referred to as *ba* – which is the place where information is interpreted and acted upon to become knowledge. Thus *ba* provides an important part of the knowledge conversion process, where information becomes knowledge.

Effective knowledge creation is also supported by five knowledge enablers within organisations (Von Krogh, Ichijo & Nonaka, 2000):

- **Instilling a knowledge vision** – the key criteria for assessing the quality of a knowledge vision are: commitment to a direction; generality; a specific style; a focus on restructuring the current knowledge system; a focus on restructuring the current task system; external communication of values, and a commitment to shaping competition.

- **Managing conversations** – the key principles for managing good communication in organisations are: actively encouraging participation; establishing conversational etiquette; editing conversations appropriately; and fostering innovative language.

- **Mobilising knowledge activists** – organisations require knowledge activists to promote the creation of new knowledge. These activists fulfil the role of catalysts, co-ordinators, and "merchants of foresight" within knowledge-creation processes. Knowledge activism is said by Von Krogh, Ichijo & Nonaka (2000) to have the purposes of:

  - Initiating and focusing knowledge creation.

  - Reducing the time and cost necessary for knowledge creation.

  - Leveraging knowledge creation initiatives throughout the organisation.

  - Improving the conditions of those engaged in knowledge creation by relating their activities to the company's bigger picture.

- Preparing participants in knowledge creation for new tasks in which their knowledge is needed.

- Including the perspective of micro-communities in the larger debate on organisational transformation.

- **Creating the right context** – to promote knowledge enabling contexts in organisations, the following types of interactions are necessary:

  - *Originating interactions* – which is about how individuals share feelings, tacit knowledge, emotions and experiences.

  - *Conversing* – which allows for people to share their mental models and skills to form concepts.

  - *Documenting* – which allows for the conversion of knowledge into explicit forms.

  - *Internalising* – where individuals internalise explicit knowledge (converting the knowledge into tacit knowledge again).

- **Globalising local knowledge** – the essential purpose of globalising local knowledge is to enhance the capacity for social action, competence and successful task performance. To achieve this, knowledge needs to be locally recreated (Von Krogh, Ichijo & Nonaka, 2000) through the following process:

  - *Triggering* – which begins with the recognition of a need or opportunity. Groups or individuals then search for a possible solution, using approaches and tools such as bulletin boards, regular knowledge conferencing and the use of knowledge activists.

  - *Packaging and dispatching* – relates to the movement of explicit knowledge across organisational boundaries. It includes: deciding on what knowledge needs to be packaged; deciding what the sequence of shipment ought to be; having local experts or spokespeople assigned to the dispatched knowledge who can explain and provide assistance on the knowledge; deciding the knowledge storage container; and developing a knowledge-exchange policy.

  - *Recreating* – is about how knowledge that has been dispatched is reassembled at a local level, to suit a changed environment to that in which knowledge was first created. It may be that the recipients of the knowledge have to improvise to adapt the explicit knowledge being

transferred. This improvisation leads organisations to kick-start the knowledge creation process again: starting with sharing tacit knowledge; creating a concept; justifying the concept; building a prototype; and cross-levelling knowledge.

Organisations that intend conducting knowledge management programmes or initiatives need to firstly understand the way that knowledge is created in organisations through conversion processes like the SECI process advocated by Nonaka & Takeuchi (1995) and Nonaka, Toyama & Nagata (2000). They need to be aware that new organisational knowledge is created when individuals come together and socialise their tacit and explicit knowledge.

Organisations also have to have some recognition that the SECI process operates in spirals and is influenced and driven by knowledge strategies, organisational shape and organisational cultures that provide for flexibility and autonomy. In addition, organisations should have awareness that knowledge creation processes typically consist of sharing tacit knowledge, creating concepts, justifying concepts, building a prototype and cross levelling knowledge, which are largely people and socially based processes.

Having a knowledge-enabling context within organisations is also said to be an important ingredient in encouraging knowledge creation to occur in organisations. Furthermore, it needs to be recognised that there are five key knowledge enablers which influence knowledge creation: instilling a knowledge vision; managing conversations; mobilising knowledge activists; creating the right context; and globalising local knowledge. When conducting knowledge management work, organisations need to have a rudimentary understanding of how these knowledge-creation processes work and how knowledge enablers impact upon them. ,

Out of the five enablers, knowledge management could provide support for the globalisation of local knowledge phase. In particular, the triggering and packaging processes rely on tools and approaches such as bulletin boards and knowledge conferencing, and the dispatching processes on the movement and shipment of explicit knowledge across organisational boundaries. Recreating knowledge in this phase also triggers off the knowledge-creation process again, which knowledge management could have a role in supporting.

2.3.3 Knowledge Use in Organisations

Knowledge management initiatives are said to fail and not be successful when they are isolated or divorced from the way in which organisational knowledge is used in organisations.

This is because those who design and build knowledge management initiatives and systems may have limited or inaccurate views about how people use organisational knowledge every day in their jobs (Pfeffer & Sutton, 1999).

However, this view is based on the assumption that users and creators of original knowledge don't get involved with designing and implementing knowledge management initiatives. This may not necessarily be so.

But it is important that the organisational knowledge captured in knowledge management systems or transmitted by knowledge management tools needs to be useful to its intended recipients. Knowledge management approaches developed and implemented in organisations need to be tailored around the types of organisational knowledge that is used by staff every day in their jobs; ie, it has to be significant or important organisational knowledge that is contained within knowledge management tools and systems.

Therefore, organisations have to be confident that knowledge they capture in knowledge management systems for use is what the organisation needs, and what staff commonly refer to in carrying out activities and functions. Many organisations have fallen into the trap, in using knowledge management, of collecting data, information and knowledge that has not been used, because the organisation didn't ask staff what data, information or knowledge would be most valuable and in what format it was needed to aid performing roles and activities (McCune, 1999).

This means that knowledge management system users have a role to play in developing and implementing knowledge management programmes and initiatives. Knowledge management system users must actively contribute their tacit knowledge to knowledge management systems (Leidner, 1999).

If staff cannot relate organisational knowledge captured and transferred in knowledge management tools to their jobs and activities performed, it is unlikely that they will see any benefit in using knowledge management tools and systems as part of their day-to-day work.

In addition to providing information about the types of knowledge required and to inputting their own tacit knowledge, knowledge management system users also

need to become knowledge stock maintainers. Accessing and using organisational knowledge within organisations is said to only be the initial step in a knowledge management process or initiative, which must become continuous and never-ending (Davenport, 1998). This, too, also suggests that staff have to be involved in designing, implementing and maintaining knowledge management initiatives. Their roles are so central to the success of a knowledge management initiative that their input cannot be excluded from the initiatives undertaken.

This tends to suggest that once organisations have started knowledge management work, they are likely to find that it doesn't have a finite end point. Organisations may not be willing to make this sort of commitment into knowledge management without knowing more about its benefits, advantages and full implications. They also need to appreciate that knowledge management forms a continual process.

The use of organisational knowledge in organisations also raises questions around ethics. It can be viewed that all explicit material created on the job rightfully belongs to the organisation in which it is created (McInerney & Le Fevre (2000), and its storage in knowledge repositories and other knowledge management stores is appropriate. However, there is a question about who owns the knowledge residing within staff – the staff member or the organisation – particularly if the individual has gained the knowledge through carrying out their job or work-related activities.

The potential exploitation of an individual's knowledge raises questions of fairness and justice. In effect, it may be very difficult to draw boundaries between what knowledge belongs to an individual and what knowledge belongs to an organisation. There is a question of ethics about mining knowledge from staff – who is the owner of knowledge: the organisation or an individual staff member?

In summary, knowledge is inherently bound to people, and by adopting processes and techniques that force staff to formalise or share knowledge, organisations may in fact be lowering its value and causing staff to resist sharing knowledge. Therefore, it is important when designing and implementing knowledge management initiatives to understand the philosophy behind what knowledge is needed by staff to carry out their everyday jobs and how they share knowledge.

Organisations also have to know what organisational knowledge is critical to the organisation's success, how staff use it, and how best to make long-term use of it. The literature studied also suggested that staff need to be involved in designing, developing, implementing, and maintaining knowledge management initiatives and systems. Without this input, knowledge management initiatives could tend to

become isolated from need or go unused by staff, particularly if organisational knowledge is captured in knowledge management tools that staff don't need or refer to on a regular basis.

2.3.4 Knowledge Sharing and Transferring in Organisations

Sharing knowledge in organisations is said to be dependent on creating appropriate infrastructures and trust within organisations (either between individual staff members or between staff members and outside agencies such as partners and suppliers). Trust in organisations also tends to be based on some sort of exchange or transaction (particularly of explicit knowledge).

In addition to the need for trust within organisations to support knowledge sharing, the state of "care" exists when people voluntarily co-operate and freely give or share tacit knowledge (Scharmer, 2001) and needs to exist in organisations to promote knowledge-creation behaviours (Von Krogh, Ichijo & Nonaka, 2000).

It is particularly important to foster care in organisational relationships, as the sharing of tacit knowledge cannot be based on being able to immediately recognise the value of tacit knowledge traded. The nature of tacit knowledge means that individuals must trust one another and share such knowledge, then allow for time to elapse before it is used.

The notion of care in organisations refers to:

- Mutual trust, particularly between individuals.
- Active empathy in order to understand what another individual needs.
- Access to help, particularly when it is needed.
- Lenience in judgement, so that individuals can learn from mistakes and feel unconstrained to pass on what they have learnt.
- Courage to allow experimentation, test concepts and give feedback.

Nonaka, Toyama & Nagata (2000) also echo these ideas by suggesting that knowledge creation and sharing is dependent on having organisational cultures that foster care, trust and commitment. In addition, organisational cultures that demonstrate fairness, innovativeness and affiliation are more likely to encourage knowledge sharing and have a large impact on knowledge-sharing behaviour (Bock, Zmud, Kim & Lee, 2005)

There are three levels of motivation that are considered critical to knowledge sharing: individual benefit; group benefit; and organisational benefit. Also critical are organisational cultures and climates that have a high level of trust and include the characteristics of: easy access to information; tolerance of mistakes; and encouragement of care (Bock, Zmud, Kim & Lee, 2005).

However, there are other matters that can impede knowledge sharing from occurring in organisations. In particular, forcing staff to share organisational knowledge or codify knowledge they hold may be resented and could be resisted. This reaction would counter the aims of knowledge management – to use, capture and share knowledge to further organisational objectives.

Organisations need to consider the impact of this potential barrier to knowledge sharing and need to be clear that knowledge management initiatives can help with the sharing or accessing of organisational knowledge only. It is noted that knowledge management practices to date have tended to focus on systems and tools, rather than understanding people and processes (Scarbrough & Swan, 2001).

Organisational reward schemes may also act as a deterrent to individuals sharing their knowledge within organisations, as individuals can be discouraged from sharing knowledge they have acquired or created if they are rewarded for knowledge that sets them apart from peers (Bock, Zmud, Kim & Lee, 2005) or if sharing lowers the value of the knowledge to its first owner (Nonaka, Toyama & Nagata, 2000). Knowledge can still remain hidden to others in knowledge management initiatives, unless the owner of the knowledge makes it available (Bock, Zmud, Kim & Lee, 2005) or if individuals don't co-operate in externalising their knowledge (Nonaka, Toyama & Nagata, 2000).

In this view, changing people's behaviour becomes the largest hurdle to promoting knowledge-sharing behaviours (Bock, Zmud, Kim & Lee, 2005). One way of countering this is to provide reward systems designed to explicitly promote the sharing of individuals' knowledge (Nonaka, Toyama & Nagata, 2000).

In addition to the knowledge-sharing barriers discussed above, there can also be barriers hindering knowledge transference. Individuals may be hindered from absorbing new knowledge by having little accommodation for new knowledge, new knowledge may threaten their self image (Von Krogh, Ichijo & Nonaka, 2000) and knowledge which resides in individual and organisational practices is not easily expressed (being largely tacit knowledge), replicated or accessed (Spender & Grant, 1996). Further, organisations may not be aware of individuals' expert knowledge or have the ability to use it to maximum advantage.

Knowledge transfer is a complex process (Nonaka, Toyama & Nagata, 2000) and is reliant on time, effort and resources in order for the recipient of the knowledge to absorb it. Although it is noted that it is a challenging task to extract expertise, knowledge and learning from one person and transfer it to another, this is preferable to the alternative of having valuable organisational knowledge lost when skilled and knowledgeable staff leave an organisation (McInerney & Le Fevre, 2000).

The ability to create new knowledge from existing knowledge is largely achieved through learning by doing, and it is difficult for other organisations to replicate this knowledge without mirroring systems, culture, norms and staff from the organisation where the knowledge is created (Nonaka, Toyama & Nagata, 2000).

It is suggested that social interaction processes like workshops, seminars, meetings in the cafeteria and telephone calls are still the most important channels for informal knowledge transfer (Kempis & Ringbeck, 1999 and Pfeffer & Sutton, 1999). These knowledge-sharing methods also need to be considered and taken into account in any potential knowledge management initiative.

Knowledge management systems are also said to rarely reflect the fact that essential organisational knowledge is often transferred between people by stories, gossip and watching one another work. Some knowledge management writers believe that organisational knowledge is best transmitted and added to through storytelling, mentoring and improvisation for problem solving (Brown and Duguid, 2000 and Swap, Leonard, Shields & Abrams, 2001).

One form of knowledge sharing and transferring has been developed through the formation of communities of practice, which are informal groups who stimulate knowledge sharing, learning and change. These groups of people tend to be bought together by shared expertise and interest in issues (Wenger & Snyder, 2000). Some commentators believe that these communities of practice will eventually evolve into networked societies (Feraud, 2000).

However, at present communities of practice are not prevalent, as few organisations have taken the step of encouraging them due to the difficulty of building and sustaining them over time. In particular, they present technical, cultural and management challenges (McDermott, 1999) as they are informally based.

It is recommended that the formation and maintenance of communities of practice should be encouraged in organisations to help with knowledge-sharing processes

and behaviours (Bock, Zmud, Kim & Lee, 2005). Although communities of practice can't actually be managed, they may prove to be a useful tool for organisations to promote knowledge sharing and use.

In addition to the views about communities of practice, another similar type of work group involved with creating knowledge is micro-communities (Von Krogh, Ichijo & Nonaka, 2000). People who belong to micro-communities tend to communicate through face-to-face interactions.

Like communities of practice, micro-communities are said to come together to share knowledge about common issues of interest, and can come from diverse original backgrounds. It is their point of interest and sharing of tacit knowledge that binds them together (Von Krogh, Ichijo & Nonaka, 2000).

What these ideas point to is that it is important to get staff to articulate and share knowledge. Organisations have to think about ways of facilitating this. If a group of people doesn't already share their knowledge within organisations, or doesn't have contact, or doesn't understand what knowledge will be useful for others, then knowledge management is not likely to be useful in aiding knowledge sharing and transferring, and is unlikely to succeed.

In summary, knowledge sharing in organisations relies on a number of conditions. These include having appropriate infrastructures along with cultures that are dominated by trust and care (to allow people to willingly share their tacit knowledge).

Organisations also need to understand social relationships and interaction between staff, and encourage knowledge-sharing forums such as communities of practice and micro-communities of knowledge. They also need to be aware of the motivational forces that influence knowledge sharing: individual benefits; group benefits; and organisational benefits.

In order to promote knowledge-sharing cultures, organisations need to recognise that appropriate rewards need to be offered to support knowledge sharing. These need to avoid some of the pitfalls that arise from rewarding individuals for their specialist knowledge per se, so that knowledge-sharing behaviours are rewarded.

Organisational cultures also have a large part to play in supporting knowledge management initiatives. It is considered that organisational cultures need to be knowledge friendly, support knowledge sharing and demonstrate trust, in order to best support a knowledge management initiative.

Organisations have to be aware that tacit knowledge resides in individuals and organisational practices, and may be difficult to access and replicate. In fact, they may not always be aware of this type of organisational knowledge. The transfer of organisational knowledge is complex and relies on time, effort and resources on the part of its recipient.

Knowledge management initiatives often entail changes to staff behaviour and improvements to work processes and practices. To drive this, knowledge management initiatives need to be led from the top of organisations and need senior management 'buy-in' to support the change in behaviour desired. Organisations need to allow for this to occur when developing and implementing knowledge management initiatives.

Allowances also need to be made for supporting other socially-based knowledge-transfer processes such as workshops, seminars, story telling and communities of practice to support or complement more formal, technically-based knowledge management systems and processes.

These cultural issues point to the fact that knowledge creation, transfer and use are dependent on people. If staff members are unwilling to share their knowledge or can't see the benefit in doing this, then it is doubtful that a knowledge management initiative will succeed. Individual staff members have to see the value in sharing their knowledge within an organisation.

2.3.5 New Organisational Forms

In order to best support knowledge creation processes, organisational forms and practices often need to change (Nonaka & Takeuchi, 1995). Two organisational forms that support knowledge creation are the hypertext organisation and the knowledge-based view of the firm. These forms are discussed in detail below.

- **Hypertext Organisation**

  A hypertext organisation is one new form that supports the continuous creation of knowledge (through the spirally-based SECI process) and a middle-up-down style[3] of organisational management (Nonaka & Takeuchi, 1995).

[3] The management style of middle-up-down is needed, where team leaders and middle managers are at the centre of knowledge management, often acting as conduits, passing knowledge between the top levels of the organisation down to the front line, and vice versa (Nonaka & Takeuchi, 1995).

The core elements of a hypertext organisation are:

- Having staff who can easily move from one context to another.
- Having a non-hierarchical, self-organising structure working in tandem with a hierarchical formal structure.
- Having a series of interconnected layers or contexts such as a business system level, a project team level and a knowledge-base level. Staff would work in the first two levels mentioned, and the knowledge-base level would provide infrastructure knowledge like the organisation's vision and strategy, organisational culture and technology. This level taps into and collects tacit knowledge and explicit knowledge, and can be easily accessed through IT systems. Knowledge becomes readily accessible and available through this level.

Team members from different parts of the business system level can be assigned to a project team at the top level, , and would be creating knowledge in their project. Once their project had been completed, they would work in the knowledge-base level, recording and reshaping knowledge etc gained during the project. They would then return to the business system level and perform routine tasks until asked to join another project (Nonaka & Takeuchi, 1995).

The hypertext organisation can most readily support the SECI process of knowledge creation, rather than existing models, which only tend to support parts of this knowledge-creation process. A hypertext organisation can also support the conversion of knowledge from outside of the organisation, as it interacts on knowledge processes with customers and suppliers (Nonaka & Takeuchi, 1995).

In support of these ideas expressed by Nonaka & Takeuchi (1995), organisations that have undertaken knowledge management initiatives have had to change form and concentrate on knowledge processes, and adopt new values to become more knowledge-based, in order to focus on generating or creating new knowledge (Scharmer, 2001). In forming new virtual teams and structures, organisations lose the ability to share some forms of knowledge, by creating physical distance and space between people. Knowledge management is said to have been created in answer to the issues and challenges related to the new ways of organising business (Scarbrough & Swan, 2001).

However, in contrast Von Krogh, Ichijo & Nonaka (2000) believe that in a hypertext organisation, knowledge creation needs to be supported by

managers, rather than them trying to control it. They consider that managers can have an influence on knowledge enabling (the organisational functions that affect knowledge creation positively) which is about facilitating relationships, together with sharing localised knowledge either within an organisation or on its boundaries . This knowledge enabling is pivoted on the idea of care within organisations (Von Krogh, Ichijo & Nonaka, 2000).

It is considered that, although the creation of knowledge within organisations is said to need support by the creation of new practices, such as middle-up-down management, organisations may be unwilling to go to these lengths to support knowledge creation process, unless they can see the benefit of doing this.

Organisations that implement knowledge management initiatives may have to consider carrying out this type of action to get the best results from what they are doing. Similarly, it may be necessary to change organisational forms to those such as hypertext organisations to support the continuous creation of knowledge within organisations.

Again, organisations may be reluctant to carry this out unless they do become knowledge centric or are aware of the benefit that knowledge can provide for them. Organisations need to have a good understanding of how knowledge is created by individuals and teams before altering their structures or changing their original practices; otherwise they could risk adversely affecting knowledge creation and transfer processes.

- **Knowledge-Based View of the Firm**

The new environment that regards knowledge as a key economic resource is said to have given rise to a new organisational form: a knowledge-based view of the organisation. This knowledge-based view of the organisation focuses on knowledge creation and utilisation to create competitive advantage (Nonaka, Toyama & Nagata, 2000).

Furthermore, knowledge creation becomes the raison d'etre of an organisation, where knowledge enables the creation of new products, services or processes, or the improved effectiveness and efficiency of existing ones (Nonaka, Toyama & Nagata, 2000).

A knowledge-centric view of an organisation relies on the need to examine how organisational knowledge is produced, through functions undertaken, organisational strategies, culture and structure. These types of organisation are

organised and managed with a primary focus on knowledge (Nonaka, Toyama & Nagata (2000).

However, a different view of the knowledge-based view of the organisation places its key focus on managing organisational knowledge resources, together with related human, financial and material (ie, IT system) resources (Holsapple & Joshi, 2001).

Holsapple & Joshi (2001) see this wider take on knowledge resources as significant, as they consider that competitive advantage comes from understanding the wider chain of knowledge activities used to manipulate knowledge, not just from managing knowledge stocks themselves.

In contrast, Von Krogh, Ichijo & Nonaka (2000) echo the ideas of Nonaka, Toyama & Nagata (2000) and maintain that it is not possible to manage knowledge itself. For them, a knowledge-based view of the organisation must take this into account.

In addition, Von Krogh, Ichijo & Nonaka (2000) believe that it is essential for knowledge-centric organisations to take time considering what knowledge means in their organisation and how to apply the concept of knowledge practically.

Although the concept of a knowledge-based view of an organisation is relatively new and there are differences in view about what the term refers to, there are some key ideas which could be drawn from it.

These include the idea that organisations exist in order to create knowledge, and that organisations need to examine and understand in detail how knowledge is produced, and what knowledge means to them.

2.3.6 Role of IT in Managing Organisational Knowledge

It has been commented that, in the last 20 years, industries in the US have spent more than $1 trillion on IT, but have realised little improvement in organisational efficiency or effectiveness. In this regard, IT has been viewed as some sort of panacea to help solve organisational inefficiency. This has been attributed to organisations not understanding how their staff collaborate, share knowledge and build on others' ideas (Malhotra, 1998).

Furthermore, it has been raised that the confusion between knowledge and information has caused organisations to spend a lot on IT, which has delivered

marginal results, rather than looking at organisational knowledge and its use in social processes (Sveiby, 1997).

It is considered that IT is a useful enabler for the storage and transmission of knowledge, but it isn't particularly helpful in its creation or use (Davenport, 2000, Kempis & Ringbeck, 1999 and Davenport, 1997). Effective management of knowledge requires solutions that marry human-based knowledge with supporting IT systems (Davenport, de Long & Beers, 1998).

In addition, knowledge management systems are said to be useful for finding knowledge that has been codified, but there is a great deal of organisational knowledge that remains uncodified (Ruggles, 1998). For these reasons, organisations need to have multiple channels for knowledge access and storage (Davenport, de Long & Beers, 1998).

What all of these ideas put forward by Sveiby (1997), Davenport (1997 and 2000), Kempis & Ringbeck (1999), Davenport, de Long & Beers (1998), and Ruggles (1998) point to is that organisations shouldn't see investing in IT or knowledge management systems alone as an instant cure for improving organisational performance or as the solution to managing organisational knowledge.

Knowledge has such important links to people and social processes that it has to be recognised that systems cannot replace or duplicate these knowledge-sharing relationships. Thus, IT systems should be seen as enablers that support knowledge sharing in organisations. Knowledge management systems also have to be focused on supporting the sharing of different types of knowledge within organisations.

Organisations achieve the greatest benefit from using IT when coupling IT investment with investment into new strategies, new business processes and new organisational forms (Brynjolfsonn & Hitt, 1998) and knowledge management initiatives must be integrated with other organisational initiatives to be most effective (Damodaran & Olphert, 2000).

Malhotra echoes this by saying "that successful implementation of IT, BPR, knowledge management or what have you requires deep understanding of not only people, processes and technology issues, but the changing nature of business as well as the changing business of IT" (Malhotra, 2000:2). These matters point to the fact that organisations should look holistically at organisational issues such as culture, strategies, structures and work processes, when developing and implementing knowledge management initiatives.

Another technology issue that needs to be taken on board for knowledge management initiatives is that, although it is relatively straightforward to measure the costs of developing and implementing knowledge management systems and to measure the direct outputs from these, it is relatively difficult to measure the extent to which organisational knowledge generated from knowledge management systems is used and what impact this knowledge has on the long-term health of the organisation.

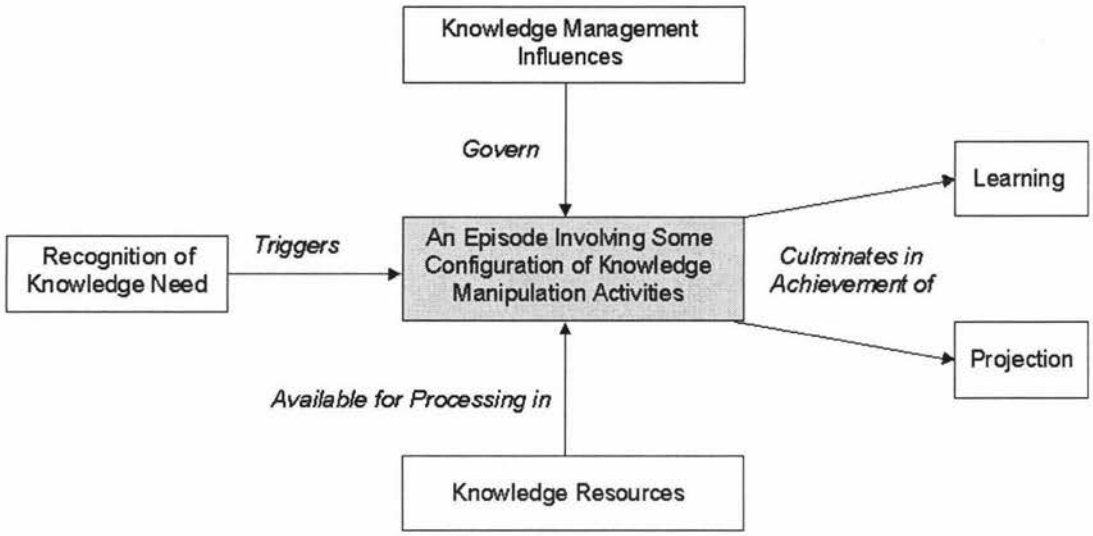
It is also difficult to pinpoint if the end result reached – that is, the use of knowledge – was a good return for the outlay of investment needed for the initial development and implementation of the knowledge management initiative.

These technology issues need to be carefully considered by organisations thinking about undertaking knowledge management initiatives.

2.3.7 Role of Knowledge Management in Managing Organisational Knowledge

Knowledge management aids managing knowledge by "getting the right knowledge to the right processor at the right time in the right representation and at the right cost" (Holsapple & Joshi, 2002a:477). A knowledge management episode beginning in the recognition of a knowledge need and ending in its solution or abandonment may be a single event or part of a chain or cluster of interrelated episodes (Holsapple & Joshi, 2002a). This process is shown below as Figure 2.

Figure 2 - Holsapple & Joshi's Architecture of a Knowledge Management Episode During the Conduct of Knowledge Management

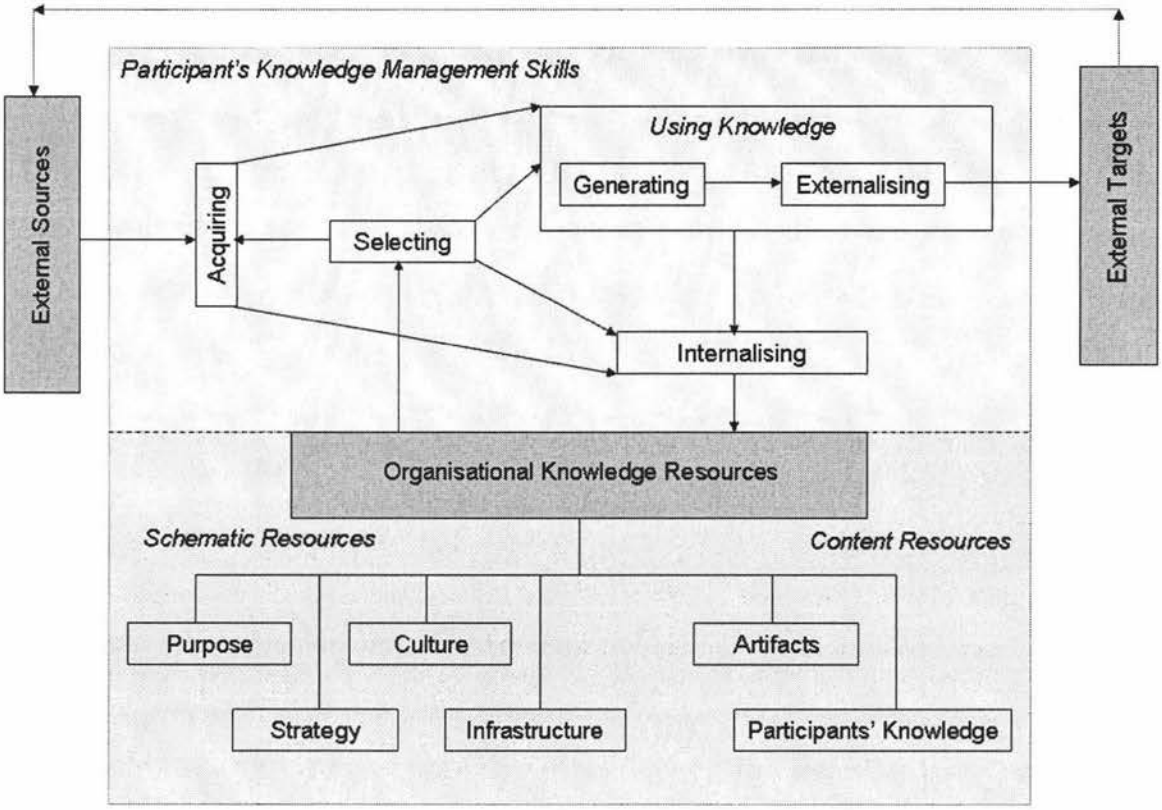


Source: Holsapple, C. W. & Joshi, K. D. (2002a). Knowledge manipulation activities: results of a Delphi study, *Information & Management*, 39, 477-490.

There is a common set of inter-connected knowledge management activities that are carried out in every organisation, which are reliant upon the interconnected knowledge manipulation functions of acquiring, selecting, internalising and using knowledge. It is these knowledge manipulation activities that are used, along with knowledge resources, to create value in organisations (Holsapple & Joshi, 2002b).

Knowledge management in organisations is dependent on applying knowledge management and manipulation skills to an organisation's knowledge resources, as shown in Figure 3 below.

Figure 3 - Holsapple & Joshi's Major Knowledge Management Activities



Source: Adapted from Holsapple, C. W. & Joshi, K. D. (2002b). Knowledge management: a threefold framework, *The Information Society*, 18, 47-64.

Knowledge management is also affected by resource influences, managerial influences and environmental influences. In particular, resource influences around knowledge resources and financial resources can act as a constraint, while managerial influences such as leadership, co-ordination and measurement can have a significant impact on how knowledge management is conducted in organisations (Holsapple & Joshi, 2002b).

Without the commitment of leadership, it is difficult to effectively leverage knowledge and, similarly, without co-ordination or measurement, it is difficult to ensure that organisational knowledge resources are effectively and efficiently used during knowledge management activities.

There are three common pitfalls around knowledge management (Von Krogh, Ichijo & Nonaka, 2000):

- Knowledge management can rely on easily accessible quantifiable information – the type of information that is available in documents, policies, procedures and databases that is easily stored, accessed and transmitted through IT systems.

However, this also relies on the idea that knowledge is equal to information, and IT systems provide the answer to knowledge sharing, but they in fact have limited use in sharing tacit knowledge and are not the answer to aiding knowledge creation.

- Knowledge management can centre on the development and implementation of tools – the focus on tools and methods can hinder creativity and social contact processes.

- Knowledge management can depend on a dedicated knowledge officer or champion – which can give knowledge in organisations a limited exposure, whereas in fact knowledge is created throughout an organisation, and often at the front line.

In addition, knowledge management commentators like McCune (1999) and Scarbrough (1999) point to a range of organisational cultural obstacles that can hinder the effectiveness of knowledge management initiatives. These are focused on issues such as staff unwillingness to share their knowledge with others, resistance to change, lack of organisational culture support, and the need to change individuals' behaviour. The difficulty with most knowledge management effort lies in changing organisational culture and work habits.

Knowledge management initiatives also need to be built on a culture of trust (Damodaran & Olphert, 2000) and be implemented into knowledge-friendly cultures (Davenport, de Long & Beers, 1998) in order to survive. A knowledge-sharing culture is said to be the most important organisational condition for successful knowledge management initiatives (Damodaran & Olphert, 2000).

Without these cultural conditions being present, knowledge management initiatives are not likely to be adopted by staff. If people do not trust each other, it is doubtful that knowledge transfer will be successful because new knowledge from different parties will not be valued or absorbed (McInerney & Le Fevre, 2000).

Organisations need to consider whether their cultures can support knowledge management initiatives, by ascertaining if they will support knowledge sharing, if they are knowledge friendly and if they are built on a high degree of trust. If organisational cultures do not or are unlikely to support these conditions, it is unlikely that knowledge management initiatives will flourish.

The development of knowledge management has largely been based on the view that knowledge is an economic resource. However, this is hinged on the assumption that, if knowledge is a critical resource and provides a source of

competitive advantage, then it must somehow be managed more efficiently, ignoring the wider questions of whether knowledge and knowledge work can or should be managed (Swan & Scarbrough, 2001).

The nature and location of tacit knowledge makes it difficult to codify or capture formally. The act of trying to manage knowledge or formalise it through knowledge management initiatives may, in fact, lower its value. Swap, Leonard, Shields & Abrams (2001) point out that attempts to extract tacit knowledge may be both unwelcome and difficult to achieve.

It is also held by some knowledge management writers that organisational performance will improve by paying more attention to creating, providing, sharing, and using knowledge (Earl, 2001). This may not always be the case. Organisations won't necessarily be guaranteed improved efficiency by implementing knowledge management initiatives. There could be other outstanding organisational issues that could override the potential benefits offered by knowledge management, or organisations may not implement knowledge management initiatives in a way that maximises the use of knowledge held in the organisation.

Many tools, guides and recommended approaches related to knowledge management have a mechanical treatment of knowledge, with key issues such as the nature of tacit knowledge, the limited role of IT systems and organisational environment influences taken lightly (Scarbrough & Swan, 2001).

Much of this arises from the commercially-based view advanced by Drucker (1993) that knowledge is the key economic resource of the day (Scarbrough & Swan, 2001 and Nonaka, Toyama and Nagata, 2000). IT-based tools and solutions have been regarded as the key emphasis in much of the literature related to knowledge management and the knowledge-based view of the organisation.

Malhotra (2000) suggests that the biggest barrier to implementing knowledge management initiatives is obtaining buy-in from senior management. Damodaran & Olphert (2000) concur with this and believe that, to be successful, knowledge management initiatives must be driven by chief executives. Similarly, the OECD (2001) considers that the implementation of a knowledge management initiative requires strong commitment from the top of organisations, overseeing implementation of knowledge management initiatives.

It is considered that, without chief executive and senior management buy-in into knowledge management initiatives, it is unlikely that knowledge management work will succeed.

Leadership is one of the most important factors in encouraging knowledge creation and sharing (Nonaka, Toyama & Nagata, 2000). Leadership is needed to provide direction to foster knowledge creation, develop organisational forms to support knowledge-creation processes and encourage organisational cultures that support knowledge sharing (Nonaka, Toyama & Nagata, 2000).

Knowledge management means changing staff behaviour, improving knowledge work practices and ensuring that knowledge is institutionalised into normal working practices (Malhotra, 2000, Davenport, 1998, and Damodaran & Olphert, 2000). However, this is often not willingly accepted by staff that may have been carrying out work practices for some time or by those staff that can't see the benefit of changing their work practices and behaviours.

2.3.8 Findings Regarding Managing Knowledge in Organisations

The literature review disclosed a number of findings about managing knowledge within organisation that are important to the aim of this research study. These are summarised below.

Knowledge creation in organisations is said to occur through the social interactions of individuals using knowledge-conversion processes. The key knowledge-conversion process discussed in this research study is Nonaka & Takeuchi's (1995) SECI process which consists of: socialisation of knowledge; externalisation of knowledge; knowledge combination; and knowledge internalisation.

This SECI process is said to operate in spirals and is supported by a knowledge-creation process made up of: sharing tacit knowledge; creating concepts; justifying concepts; building a prototype; and cross-levelling knowledge.

Having a knowledge-enabling context within organisations is also said to be a vital ingredient in encouraging knowledge creation to occur in organisations. Furthermore, there are five key knowledge enablers that influence knowledge creation: instilling a knowledge vision; managing conversations; mobilising knowledge activists; creating the right context; and globalising local knowledge.

When conducting knowledge management work, organisations need to have a rudimentary understanding of how these knowledge conversion and creation processes work and how they are impacted upon by knowledge enablers.

Knowledge management can aid the knowledge enabler to globalise local knowledge.

Organisations need to take cognisance of what organisational knowledge is needed by staff to carry out their everyday jobs and how they share and use knowledge when designing and implementing knowledge management initiatives. Organisations also have to know what organisational knowledge is critical to the organisation's success, how staff use it, and how best to make long-term use of it.

Staff input into designing, developing, implementing, and maintaining knowledge management initiatives and systems is needed to avoid knowledge management tools not being used.

Knowledge sharing within organisations relies on a number of conditions, including having appropriate infrastructures and cultures that contain the elements of trust and care so that staff members are willing to share their knowledge. It is considered that organisational cultures need to be knowledge friendly, support knowledge sharing and demonstrate trust, in order to best support a knowledge management initiative. In order to promote knowledge-sharing cultures, organisations need to recognise that appropriate rewards need to be offered to support knowledge sharing.

Organisations also need to understand social relationships and interaction between staff, and encourage knowledge-sharing forums such as communities of practice and micro-communities of knowledge.

Organisations contemplating knowledge management work have to be aware that tacit knowledge resides in individuals and organisational practices, and may be difficult to access and replicate. Developing and implementing a knowledge management initiative is not a guarantee of organisational success.

Knowledge management initiatives often entail changes to staff behaviour and improvements to work processes and practices. To drive this, knowledge management initiatives need to be led from the top of organisations and need senior management 'buy-in' to support the change in behaviour desired. Organisations need to allow for this to occur when developing and implementing knowledge management initiatives.

These cultural issues point to the fact that knowledge creation, transfer and use are dependent on people. If staff members are unwilling to share their knowledge or can't see the benefit in doing this, then it is doubtful that a knowledge management

initiative will succeed. Success depends upon staff members seeing the value in sharing their knowledge within an organisation.

Organisations that implement knowledge management initiatives may have to consider changing organisational forms and practices to get the best results from what they are doing.

Organisations also need to have a good understanding of how knowledge is created by individuals and teams, before altering their structures or changing their organisational practices; otherwise they could risk adversely affecting knowledge creation and transfer processes.

It is considered that IT is a useful enabler for the storage and transmission of knowledge, but it isn't particularly helpful in its creation or use. Effective management of knowledge requires solutions that marry human-based knowledge with supporting IT systems.

Knowledge management is interconnected with knowledge, as the skills associated with knowledge manipulation (knowledge acquiring, knowledge selection, internalisation and use of knowledge) also apply to knowledge management. The emergence of knowledge management has been linked to the increased awareness of knowledge's role in organisations, but it has also been heavily associated with IT-based tools and approaches. It has to be recognised that, by centring on knowledge management tools and approach in knowledge management initiatives, organisations can hinder social contact processes, and thereby limit knowledge sharing.

2.4 Knowledge Strategies and Knowledge Management Strategies

2.4.1 Introduction

Some knowledge management writers and researchers believe that the natural starting point for knowledge management initiatives is to develop a knowledge management strategy, which guides the overall development of knowledge management programmes (Davidson & Voss, 2002, Earl, 2001, and Hansen, Nohria & Tierney, 1999).

Knowledge management strategies are important for organisations that undertake knowledge management work as they provide a road map or guide on knowledge management work that ought to be undertaken within an organisation. These knowledge management strategies also give organisations an opportunity to explore the role that organisational knowledge takes within the organisation and how it can be utilised to aid the achievement of organisational goals and aims.

This echoes the ideas of Nonaka & Takeuchi (1995), Von Krogh, Ichijo & Nonaka (2000) and Nonaka, Toyama & Nagata (2000) who consider that understanding knowledge-creation processes begins with having a knowledge strategy which provides the vehicle for knowledge creation, acquisition, accumulation and use. Both of these types of strategies are discussed below.

2.4.2 Knowledge Strategies

Von Krogh, Nonaka & Aben (2001) draw from the ideas of Nonaka & Takeuchi (1995) and Von Krogh, Ichijo & Nonaka (2000) by suggesting that organisations can choose to develop a knowledge strategy around either knowledge creation or knowledge transfer, and can seek to either develop knowledge from the existing organisational knowledge domain[4] or create a new knowledge domain.

It is cautioned that reaching a balance between developing existing or new knowledge domains is not straight-forward and should be considered with care.

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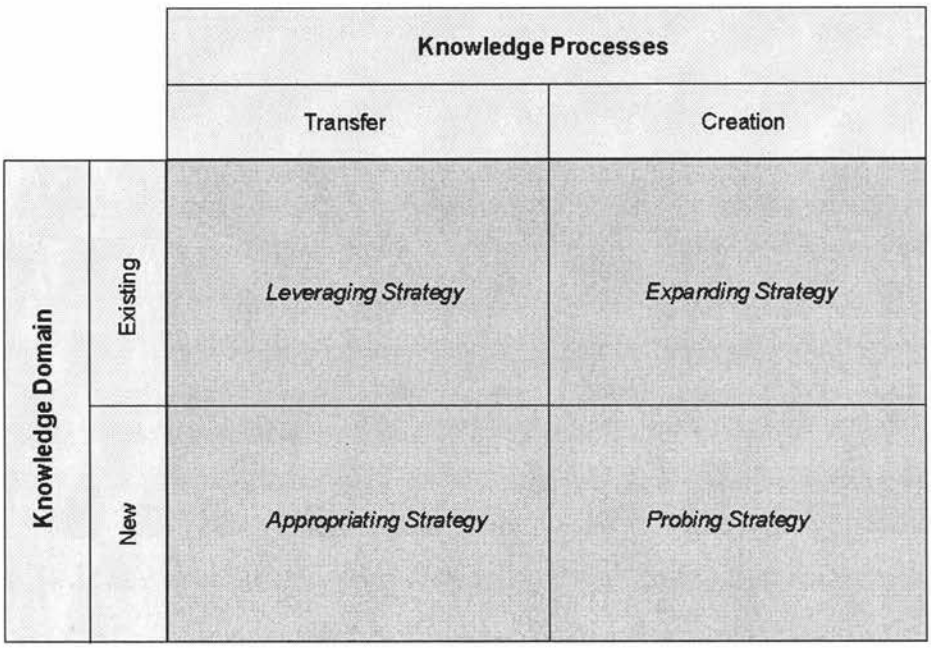
[4] This is the data, information and knowledge within an organisation, together with knowing who the key people, groups and communities of practice are within the organisation who act as guardians of this material.

Industry age and stability has a part to play in this consideration (Von Krogh, Nonaka & Aben, 2001).

There is a range of generic knowledge strategies organisations can choose from to guide managing knowledge: a *leveraging strategy*; an *expanding strategy*; an *appropriating strategy*; and a *probing strategy* (Von Krogh, Nonaka & Aben, 2001). Figure 4 below shows how each of these four knowledge strategies can be diagnosed.

Figure 4 – Von Krogh, Nonaka & Aben's Knowledge Strategy Diagnostic Tool



Source: Von Krogh, G., Nonaka, I. & Aben, M. (2001). Making the most of your company's knowledge: a strategic framework. *Long Range Planning*, 34, 421-439.

- **Leveraging Strategy** – this uses existing knowledge domains as a starting point and focuses on transferring this knowledge throughout the organisation. The leveraging strategy can help the achievement of strategic goals by focusing on achieving efficiencies in operations and reducing risk. It also ensures that existing knowledge is transferred and shared.

- **Expansion Strategy** – this also uses existing knowledge domains as a starting point, but focuses on knowledge creation, drawing on existing data, information and knowledge. It places an emphasis on increasing the scope and depth of

knowledge by refining what is known and bringing in additional knowledge creation expertise.

It helps achieve strategic goals by creating better understanding of key processes, helps achieve better innovation, and increases the ability to manage risk through leveraging new knowledge.

- **Appropriation Strategy** – this is an externally-orientated strategy, where a new knowledge domain is built up by transferring new knowledge in from external sources. It starts from the basis of having to build a knowledge domain. An appropriation strategy can help with achievement of innovation goals, as it involves partnering with another organisation to build new knowledge, products and services. It also helps to manage risks by capturing new knowledge from external sources.

- **Probing Strategy** – this again starts from the premise that there isn't an existing knowledge domain within the organisation. It involves identifying participants with an interest in doing something new within the organisation, who need to build their own community. The probing strategy can contribute to strategic goals by assisting to achieve innovation and also providing opportunities to improve business processes. It also reduces knowledge deterioration risks, as it allows for a more balanced portfolio of existing knowledge, alongside new knowledge.

Von Krogh, Nonaka & Aben (2001) consider that, to get the most out of organisational knowledge, knowledge-strategy development and choice needs to be tightly linked to other organisational strategies, as knowledge and resource allocation can be strategic drivers to creating advantage.

These knowledge strategies can assist with guiding the way in which organisations can go about managing their knowledge, particularly if they wish to maximise the value of organisational knowledge. They can act as the first stepping stone in formalising knowledge creation and knowledge transfer processes.

2.4.3 Knowledge Management Strategies

Knowledge management strategies can aid with better understanding of knowledge related processes, which drive the achievement of organisational goals. In particular, knowledge management strategies are tools that organisations intending to develop and implement knowledge management initiatives should consider using, as part of an overall knowledge management programme.

They provide the benefit of focusing knowledge management work and forming an overall roadmap for the direction of a knowledge management programme. Knowledge management strategies also provide a useful opportunity for organisations to scope knowledge management work.

Potential tools that organisations can use to diagnose and develop knowledge management strategies are presented below. Knowledge management strategies adopted by organisations tend to be formed from a number of different influences.

The most holistic writers and researchers believe that knowledge management strategies are dependent on the types of "schools" shaping thoughts about knowledge management (Earl, 2001). In particular, Earl (2001) advocates that there are seven schools of knowledge management (shown in Table 1 below), which ultimately govern the shape of a knowledge management initiative.

These schools are not seen as mutually exclusive and elements of each can be found in most organisations, and their knowledge management strategies (Earl, 2001).

Table 1 – Earl's Schools of Knowledge Management

Knowledge Management School Type	**Aim and IT Contribution Focus**
Systems School	▪ Aimed at knowledge bases and codification, where the principal IT contribution is knowledge-based systems.
Cartographic School	▪ Aimed at knowledge directories and connectivity, where the principal IT contribution is profiles and directories on internets.
Engineering School	▪ Aimed at knowledge flows and capability, where the principal IT contribution is shared databases.
Commercial School	▪ Aimed at knowledge assets and commercialisation, where the principal IT contribution is intellectual asset registers and processing systems.

Knowledge Management School Type	Aim and IT Contribution Focus
Organisational School	▪ Aimed at knowledge pooling and collaboration, where the principal IT contribution is groupware and intranets.
Spatial School	▪ Aimed at knowledge exchange and contactivity, where the principal IT contribution is access and representational tools.
Strategic School	▪ Aimed at knowledge repositories and consciousness, where the principal IT contribution is eclectic.

Source: Earl, M. J. (2001). Knowledge management strategies: towards a taxonomy, *Journal of Management Information Systems, Summer 18*(1), 215-233.

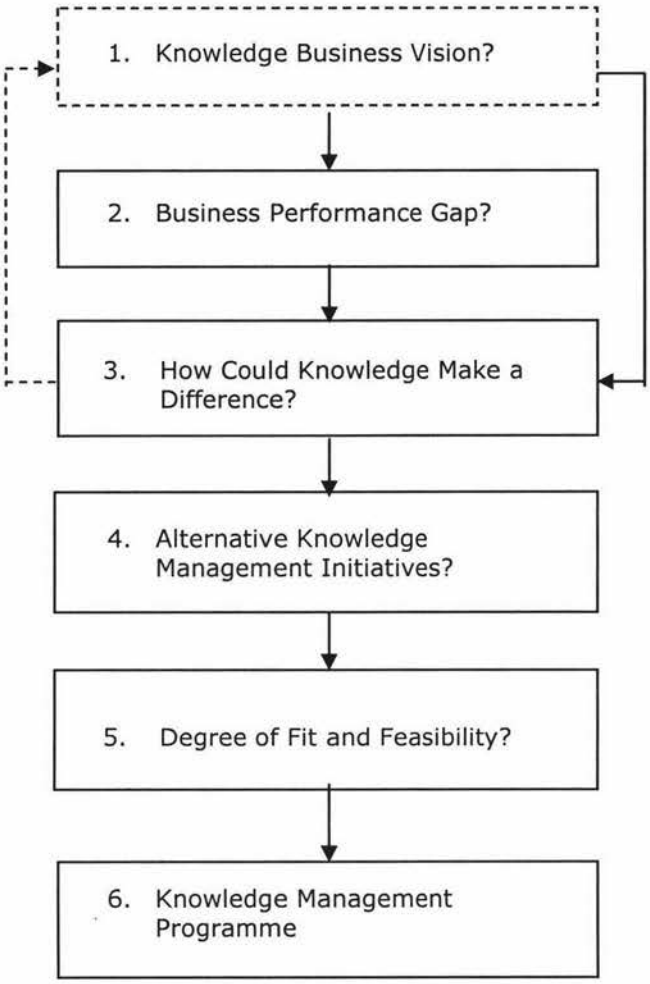
Other knowledge management writers (Hansen, Nohria & Tierney, 1999) point to knowledge management strategies being derived from the type of business operated, or the recognition of knowledge's importance within an organisation.

Suggested models for successful knowledge management strategies include the following three models:

- **The Earl Model**

Earl (2001) recommends the use of the diagnostic tool shown in Figure 5 below to formulate a knowledge management strategy to guide the development of an overall knowledge management initiative.

Figure 5 – Earl's Knowledge Management Strategy Diagnostic Tool



Source: Earl, M. J. (2001). Knowledge management strategies: Towards taxonomy, *Journal of Management Information Systems, Summer 18*(1), 215-233.

Organisations that do not have a vision that includes a reference to knowledge or the contribution knowledge makes towards organisational aims need to start the process at Step 1. If an appropriate vision including these points has been formed, the starting point becomes Step 4.

To move from Step 1 to Step 2, organisations need to examine potential performance gaps to see where knowledge management initiatives might best be aimed. These gaps can be diagnosed after performing a SWOT (strengths, weaknesses, opportunities and threats) analysis to demonstrate where shortfalls are between capability and strategy.

Step 3 poses the question "how could knowledge make a difference to resolve the gaps identified?" The results of this analysis may cause the organisation to re-examine its vision and return to Step 1.

Leading on from the analysis performed at Step 3 or directly from Step 1 (if an organisation has already developed a knowledge-related vision for itself) Step 4 asks if there are alternative knowledge management initiatives. It is about examining possible knowledge management initiatives and can be linked to each of the seven knowledge management schools highlighted in the material presented in the proceeding section.

This leads to Step 5, which is about ensuring that knowledge management initiatives fit with organisational culture and overall organisational strategy. Step 6 is about confirming the knowledge management programme, allocating resources to it and planning its implementation.

Following this outlined process, organisations can prepare a holistic knowledge management strategy, to guide the development of an overall knowledge management initiative or programme.

- **The Hansen, Nohria and Tierney Model**

Hansen et al (1999) contend that the approach taken by Earl (2001) is too broad. They maintain that there are only two types of strategies used for knowledge management, as shown in Table 2 below.

Table 2 – Hansen, Nohria & Tierney's Knowledge Management Strategy Model

Strategy Type	Focus of Knowledge Management Strategy
Codification Strategy	▪ Where knowledge (rather than information) is carefully codified and stored in databases.
Personalisation Strategy	▪ Where knowledge is closely tied to the person who developed it and it is shared mainly through direct person-to-person contact.

Source: Adapted from Hansen, M. T., Nohria, N. & Tierney. T. (1999). What's your strategy for managing knowledge?, *Harvard Business Review*, *March-April*, 106-116.

An organisation's choice of either knowledge management strategy is far from arbitrary, in the view of Hansen et al (1999), as it depends on the way the organisation serves its clients, the economics of its business, and the people it hires, as to whether a codification or personalisation strategy is the best fit. Above all, Hansen et al (1999) contend that an organisation's competitive strategy must drive the knowledge management strategy used. Organisations deciding to adopt either a codification or a personalisation strategy for knowledge management must ask themselves:

- Do you offer standardised or customised products [or services]?
- Do you have a mature or innovative product [or service]?
- Do your staff rely on explicit or tacit knowledge to solve problems?

Answers to these questions will give a sense of whether a codification or a personalisation strategy is the right knowledge management strategy to follow (Hansen et al, 1999).

For organisations with a *codification strategy* the knowledge management strategy pivots on the relationship between people and documents, and features the development of an electronic document system that codifies, stores, disseminates and reuses knowledge. These types of organisation benefit from knowledge management systems.

On the other hand, organisations with a *personalisation strategy* focus on person-to-person relationships where emphasis is placed on developing networks for linking people to enable sharing of tacit knowledge. IT is used as a support to bring these networks together (Hansen et al, 1999).

This model is closely tied to the nature of the organisation. Its key characteristics dictate choice for knowledge management strategies.

- **The Davidson and Voss Model**

Davidson & Voss (2002) maintain that there are three components that form essential ingredients of a knowledge management strategy:

- *Information and Knowledge* – the right knowledge streams and sources feeding into the organisation.
- *Technology* – the right technology to store and communicate that knowledge.
- *Culture* – the right workplace culture so that staff are motivated to make use of that knowledge.

They believe these three components have the following purposes and focuses, as illustrated in Table 3 below. Davidson & Voss (2002) also advocate that successful knowledge management can only occur when information and knowledge, technology and culture are aligned.

Table 3 – Davidson & Voss's Knowledge Management Strategy Components

Component	Purpose	Focus
Information and Knowledge	▪ Inputs into knowledge management ▪ Sources and streams of knowledge	What do we need to know?
Technology	▪ Mechanisms for the storage and communication of knowledge	How do we keep on top of what we know?
Culture	▪ Structures that motivate staff to share their knowledge and to integrate the collected knowledge into their work	How do we motivate staff to share what they know, and use what we all know?

Source: Davidson, C. & Voss, P. (2002). Knowledge management: an introduction to creating competitive advantage from intellectual capital. Auckland: Tandem Press.

This model forms the most internally focused tool for diagnosing a knowledge management strategy out of the three presented. It centres on key infrastructure areas of an organisation.

2.4.4 Findings Regarding Knowledge Strategies and Knowledge Management Strategies

Von Krogh, Nonaka & Aben (2001) recommend the use of four generic knowledge strategies to assist organisations with the management of knowledge. These include a leveraging strategy, an expanding strategy, an appropriation strategy and a probing strategy, which aim to grow knowledge domains. These can also provide some influence over the shape and form of subsequent knowledge management work. A knowledge strategy is useful for providing an anchor for knowledge creation, acquisition and use within an organisation.

Each of the three knowledge management strategy models outlined (the Earl model, the Hansen, Nohria & Tierney model and the Davidson & Voss model) demonstrates the ways in which an organisation can go about diagnosing and developing a knowledge management strategy, to guide overall knowledge management work.

They differ in focus significantly because of their authors' differing views about what knowledge management strategies ought to reflect, as discussed below.

For Earl (2001), an organisation's group of business strategies (or strategic direction) is not complete without either a knowledge or information strategy. Furthermore, he considers that business strategies, along with knowledge and information strategies, need to be integrated into one. In this view, knowledge and information help determine an organisation's overall strategic direction (Earl, 2001).

In the case of Hansen et al (1999), the dominant value of knowledge management is realised when IT is co-ordinated with competitive strategies. Their view is that companies which isolate knowledge management risk losing its benefits, and they believe that, at a minimum, knowledge management needs to be co-ordinated with competitive strategies, along with HR and IT strategies (Hansen et al, 1999).

Davidson & Voss (2002) build on the ideas put forward by Stewart (1997), stating that a knowledge management strategy is dependent on the building blocks of intellectual capital: having human capital, structural capital and customer/supplier capital.

It is considered that, from the three models presented for developing a knowledge management strategy, the approach recommended by Earl (2001) offers the most pragmatic and holistic knowledge management strategy diagnostic tool. This tool connects potential knowledge management initiatives and programmes into a knowledge management strategy that is directly linked to organisational visions and strategic directions.

A knowledge management strategy developed using the Earl (2001) approach also reinforces the importance of organisational knowledge to the business. It also forces organisations to consider how knowledge is related to overall organisational strategies and aims.

These connections mean that a knowledge management strategy is not developed that is out of step with other organisational strategies, or isolated from goals and objectives. It is therefore considered that this approach offers the best knowledge management strategy development tool for organisations.

2.5 Knowledge Management Systems

2.5.1 Introduction

Knowledge management systems are those information systems or information technologies that help organisations organise and access expertise, knowledge and information (Leidner, 1999). They commonly contain knowledge itself, policies and procedures, along with types of electronic storage and retrieval systems, to support organisational knowledge management behaviour (Damodaran & Olphert, 2000 and Alavi, 2000).

Examples of knowledge management systems and associated tools (Bowman, 2002) include:

- **Intranets –** corporate intranets were early forms of repository knowledge management systems. They have utilised World Wide Web (WWW) standards to simplify the tasks of storing and distributing a wide range of materials in different formats.

- **Search Engines –** these were initially developed for librarians to enable bibliographic search and retrieval, but they have been quickly adapted for the WWW. Search engines provide the ability to index any type of file by key words for subsequent search and retrieval.

- **Document/Content Management Systems** – tools that were initially developed to assist in version control, storage and retrieval for word processing documents. They have expanded for knowledge management purposes to manage additional file formats and often provide knowledge maps to categorise stored materials.

- **Collaboration Software –** collaboration tools that enable staff to share access to documents in multiple formats. These tools assist in the creation of new materials or the modification and refinement of items that have been retrieved from knowledge repositories.

- **Enterprise Information Portals –** this software was designed to create and manage knowledge repositories. Enterprise Information Portals have a broad range of features, including search engines, knowledge maps, standing queries, and simple collaboration tools, and are characterised as giving single access to a number of separate knowledge repositories.

- **Knowledge Maps –** these were created to provide useful taxonomies to group knowledge into categories relevant to the organisation. Knowledge maps must allow for evolution of ideas and growth of knowledge.

- **Knowledge Repositories –** these repositories allow staff to access and utilise information stored in unstructured forms such as word documents, spreadsheets, and schematics.

Two of the most commonly used forms of knowledge management systems are knowledge maps and knowledge repositories. Both are explored in more detail in the following section.

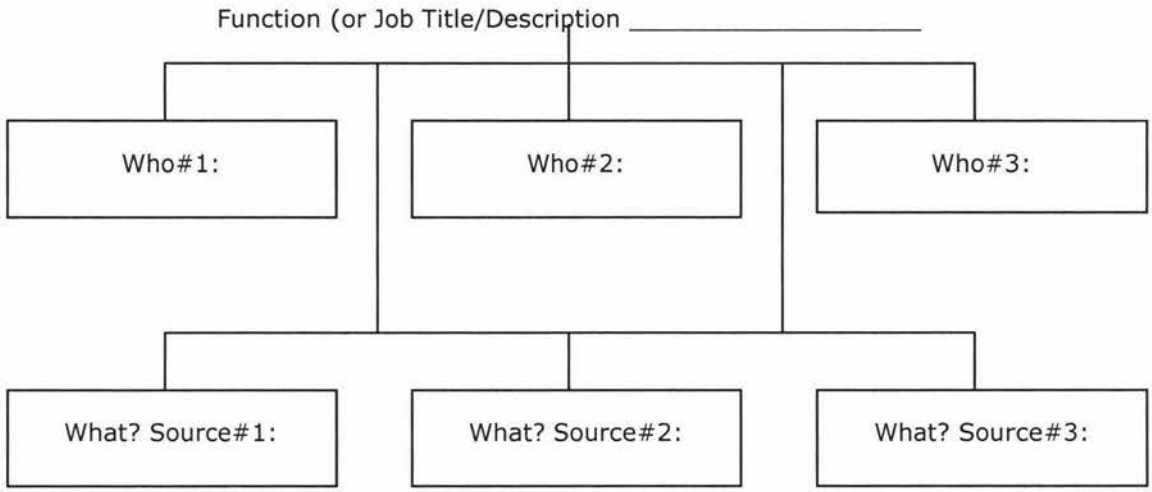
2.5.2 Knowledge Maps

A knowledge map is the visual display of captured knowledge and information in an organisation, along with organisational relationships, which enables knowledge to be acquired and transferred. The individual items of knowledge or intellectual capital included in such a map can be text, stories, graphics, models or numbers. Knowledge maps can take simple or complex forms depending on an organisation's need or use of knowledge (Vail, 1999).

An example of a simple knowledge map is shown in Figure 6. An example of a more comprehensive knowledge map is shown in Figure 7.

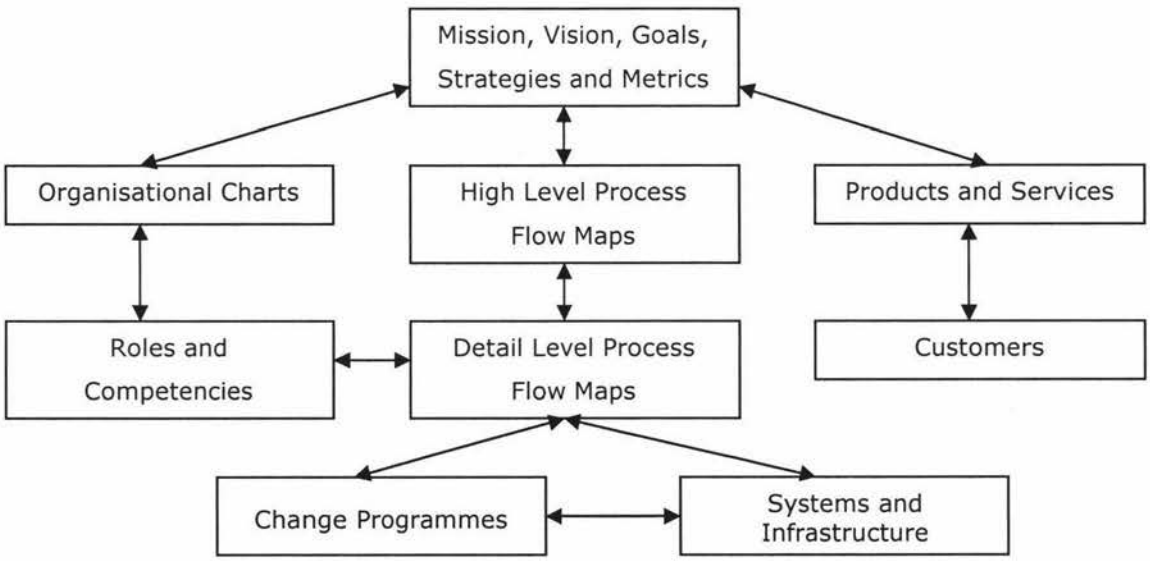
Knowledge maps also allow organisations to capture relevant knowledge that is continuously evolving, in a wide range of formats, and to create new knowledge through the discovery of new relationships or gaps between knowledge and knowledge experts. Knowledge maps also have the benefit of making knowledge accessible to everyone at every level of an organisation who needs it (Vail, 1999).

Figure 6 – Davidson and Voss's Blueprint for a Knowledge Map



Source: Davidson, C. & Voss, P. (2002). Knowledge management: an introduction to creating competitive advantage from intellectual capital. Auckland: Tandem Press.

Figure 7 – Vail's Best Practice Example of Knowledge Map Elements



Source: Vail, E. F. (1999). Knowledge mapping: getting started with knowledge management, *Information Systems Management, Fall*, 16-23.

2.5.3 Knowledge Repositories

Knowledge repositories are used to store and disseminate knowledge and information in a variety of formats. Most knowledge repositories were designed primarily to provide access to corporate knowledge stores, but it is now common for organisations to have internal portals that allow staff members to access a range of

material from different knowledge repositories at one access point (Grover & Davenport, 2001).

Repository-based knowledge management systems utilise many features (Bowman, 2002) including:

- **Text Search and Retrieval Tools** – one of the key features of a knowledge management system repository is the ability to perform keyword searches to retrieve knowledge and information. Boolean search tools are common search tools used.

- **Gateways to Enterprise Applications and Other Computing Resources –** a comprehensive knowledge management system allows users to have access to all the organisation's information and computing resources. Portals work best where users have a single interface to provide all the information they need.

- **Standing Queries –** the repository engine should be able to notify users when new repository entries matching their interests are received.

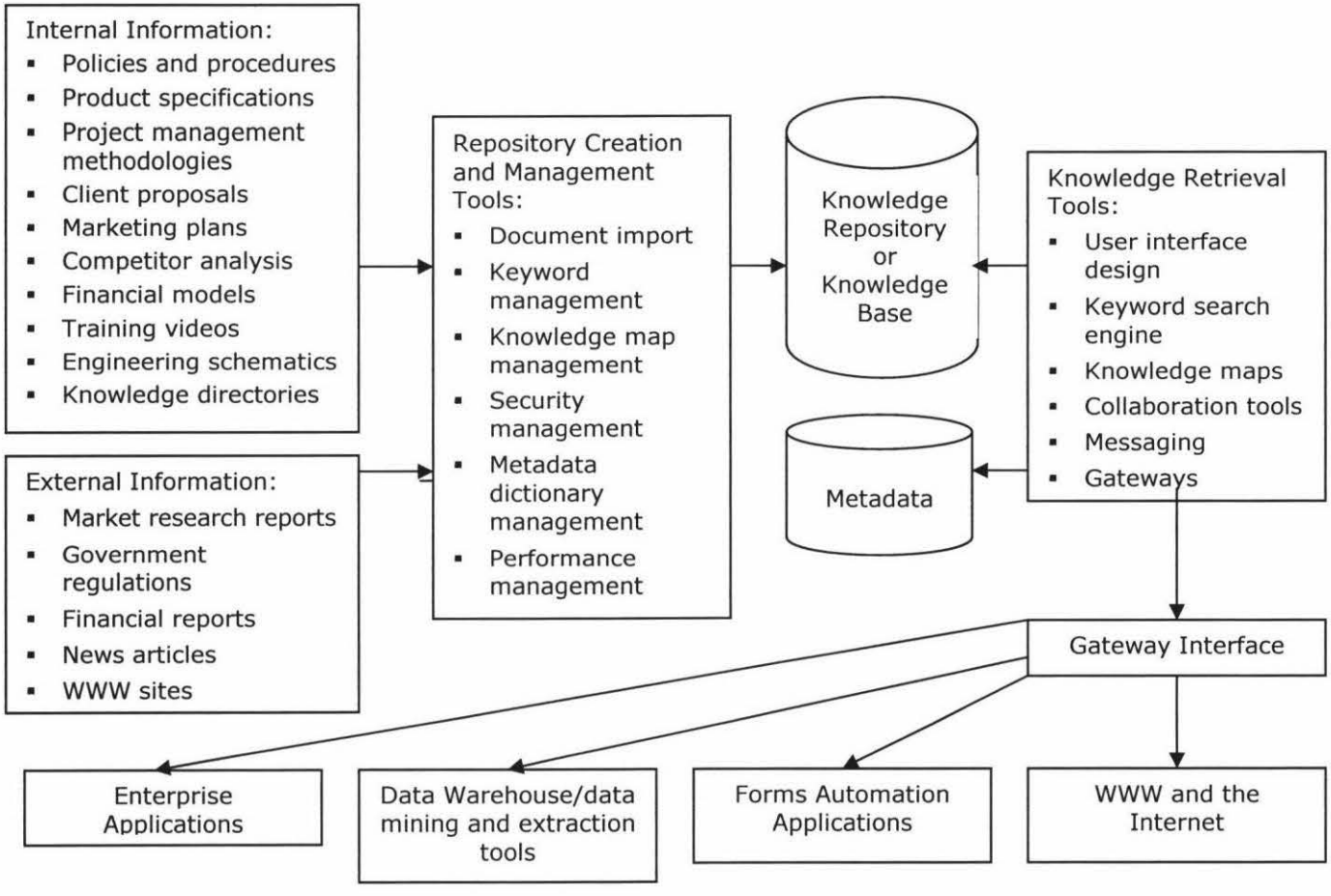
- **Knowledge Directories –** knowledge networks and directories identify experts who have knowledge about the categories included in the knowledge maps and provide contact information. As a user searches the knowledge map, the repository engine should identify the experts for each topic, in addition to the collection of stored materials. Email links can also be formed.

- **Personalisation –** giving users a personalised view of the repository contents reduces complexity and helps them access topics most germane to their jobs.

- **Multimedia Search and Retrieval Tools** – to allow for audio and video files to be incorporated into repositories and accessed using search engine retrieval tools.

A repository knowledge management system can be represented as shown in Figure 8.

Figure 8 – Bowman's Repository Knowledge Management System



Source: Bowman, B. J. (2002). Building knowledge management systems. *Information Systems Management*, *Summer*, *19*(3), 32-40.

2.5.4 Findings Regarding Knowledge Management Systems

Knowledge management systems utilised in organisations are usually tailored towards the needs of the organisation implementing them. Although they can range in design and type, knowledge management systems generally have the common purpose of providing access to knowledge and information.

The types of knowledge management systems developed by organisations, which may be structured as knowledge maps or knowledge repositories or take other forms, are dependent on the needs of an organisation. It is not a case that "one size fits all".

Knowledge management systems need to be integrated with existing IT systems operated by organisations to be able to draw on the data, information and knowledge that these may contain. They also need to be tailored towards supporting knowledge acquisition, creation and sharing processes utilised within organisations.

2.6 Knowledge Management in the State Sector

2.6.1 The Global Picture

The OECD agrees with the view expressed by Drucker (1993) that knowledge has become an important economic resource. Furthermore, the OECD (2001) sees knowledge as a crucial public good, which affects a country's overall competitiveness. They anticipate that this emphasis on knowledge will lead to significant changes in societies and organisations, resulting in the boundaries being blurred between the production, promotion and use of knowledge in the private sector and the public sector (OECD, 2001:7).

It is suggested by the OECD that "the public sector has a unique role in promoting the production, use and transfer of knowledge including:

- Providing knowledge not traditionally provided by private firms (eg: basic research).
- Ensuring education and information for all.
- Constructing information superhighways.
- Regulating knowledge production, transfer and use" (OECD, 2001:6).

Furthermore, the question is posed that it is not whether governments have ever managed knowledge or whether they should, but rather how can they improve their practices to better adapt to the knowledge age (OECD, 2001).

The OECD (2001) is concerned that governments are now at risk of falling behind the practices of leading-edge private sector companies in regard to knowledge management. In particular, governments are said to no longer hold a monopoly on knowledge in their own field, as information about policies and services delivered has become more directly available to citizens and lobby groups, primarily through e-Government initiatives (OECD, 2001:4).

The OECD considers (2001) that, as efficiency is increasingly linked to the production and sharing of knowledge, knowledge management initiatives in public sector organisations will have greater impact on a country's overall competitive advantage. Increased globalisation has led to traditional public service monopolies having to compete with foreign organisations delivering similar public services.

Knowledge management can therefore assist public sector organisations to gain strategic advantage in this type of environment (OECD, 2001).

As part of their research into knowledge management, the OECD has been conducting an international survey on what kinds of knowledge management practices are used in the private sector and their effectiveness, to gauge applicability to the public sector. Three OECD member countries, Canada, Germany and Denmark have been conducting pilot surveys to examine knowledge management practices in their respective countries.

Results from the Canadian survey show that 90% of the organisations surveyed were using knowledge management initiatives relating to the capture and sharing of knowledge by the organisation. Half of these organisations used knowledge management practices to improve their competitive advantage, and most organisations reported that the most effective result from using knowledge management initiatives was improving worker skills and knowledge, particularly to compensate for the loss of key staff (Statistics Canada, 2002).

2.6.2 The Domestic Picture

The New Zealand Government has been considering how to grow the New Zealand economy, foster innovation and promote movement to a knowledge-based economy. One approach used to promote these ideas has been "Knowledge Wave Conferences".

At the first Knowledge Wave Conference (held in 2001) representatives of the government sector, the private sector and the New Zealand community explored and made a commitment to promote New Zealand as a knowledge economy. This arose from participants' beliefs that knowledge, together with society's well-being and economic growth, are intrinsically linked (as reported by McKinsey and Company, 2003).

This was followed by Knowledge Wave Conference 2003, which amongst other things advocated that creating a knowledge-based economy for New Zealand is a knowledge management challenge on a national scale. Knowledge management for a society is said to contain three aspects (McKinsey and Company, 2003):

- **Knowledge Cultivation**

  Knowledge cultivation in societies has two main factors:

  - *Education*

Knowledge can be cultivated through education systems, provided that high quality education institutions exist at primary, secondary and tertiary levels, that individuals from all parts of society have access to these and that a high proportion of individuals make use of these institutions to progress into post-graduate level education.

- *Research and Development*

  Research and development (R & D) is a direct way of cultivating knowledge that can have relatively short payback times. New Zealand's R & D is noted to be amongst the lowest of OECD member countries.

- **Knowledge Dissemination**

Knowledge dissemination in societies is dependent on having individuals both develop and share knowledge. This involves knowledge intermediaries (such as teachers and knowledge workers) who can develop knowledge dissemination programmes. Societies need to:

- Champion knowledge dissemination as a core value of society.
- Make knowledge intermediary roles attractive to highly skilled individuals.
- Retain knowledge that is cultivated locally.
- Import the best global knowledge.

Knowledge management in society is also reliant on technology support. The following three aspects of technology are important for knowledge management in societies:

- High bandwidth to allow for the maximum speed to access knowledge.
- Search technologies to guide knowledge searches.
- Flexible access points to support access through a wide range of tools like mobile phones etc.

- **Knowledge Use**

Knowledge use in societies is reliant on individuals using their knowledge. They have to have the skills and will to use their knowledge. Knowledge use skill building must extend beyond primary, secondary and tertiary education into the

workplace. Similarly, individuals have to see the value in using knowledge. A society that values knowledge is said to be able to influence this to a large extent.

Knowledge Wave Conference 2003 participants resolved that to become a knowledge economy "New Zealand needs to maximise the creation of value from knowledge in all parts of our society: academic and educational institutes, commercial firms, government agencies, not for profit [organisations] and the community at large" (McKinsey and Company, 2003:1).

The Government has also considered what part the State sector ought to play in fostering a knowledge economy. Since the 1980s and the large reform of the State sector, successive New Zealand governments have focused on improving public management through the State Sector Act 1988 and the Public Finance Act 1989 (State Services Commission, 2003).

The current Government would like these performance enhancements to continue. It wants the State sector to move to delivering outcomes for New Zealand society in addition to traditional outputs. That is, it wants better long-term results achieved for New Zealand citizens. This will mean that government organisations will need to work more effectively together and collaborate with other agencies, stakeholders and customers (State Services Commission, 2003). In addition to this focus on managing for outcomes, the Government has also implemented its e-Government initiative to provide more services and information electronically.

The e-Government initiative (State Services Commission, 2003) has the mission that by:

- June 2004, the Internet would be the dominant means of enabling ready access to government.
- June 2007, network and Internet technologies would be integral to the delivery of government information, services and processes.
- June 2010, the operation of government would have been transformed through its use of the Internet.

The broad goals that the e-Government initiative is aimed at delivering are:

- Convenience and satisfaction – people would have a choice of channels to government information and services that are convenient, ready to use and deliver what is wanted.

- Integration and efficiency – information and services would be integrated, packaged, and presented to minimise cost and improve results for people, businesses and providers.

- People would be better informed and better able to participate in government.

2.6.3 Knowledge Management Use in New Zealand

Infinity Solutions (2002) surveyed private and public sector organisations in New Zealand in 2002 to determine what knowledge management initiatives have been implemented, along with general trends and issues associated with these. Of the 51 organisations taking part in their 2002 survey, 57% of organisations were from the private sector and 43% were State or public sector organisations.

Organisations responding to Infinity Solution's 2002 survey gave the reasons for implementing knowledge management initiatives as: improving quality; improving productivity; improving decision making; and improving response time (in that order). Benefits gained from knowledge management initiatives according to survey respondents were: improved response times; improved decision making; improved quality; and improved innovation (Infinity Solutions, 2002).

Infinity Solutions were particularly interested in exploring how organisations use tacit knowledge. Their 2002 survey indicated that 94% of the responding organisations recognised the importance of staff knowledge in achieving organisational success, but only 26% actually knew what tacit knowledge was critical to their success.

What is more revealing is that 17% of the responding organisations said that tacit knowledge had been identified and used within parts of the organisation, while only 6% reported that identification and use of tacit knowledge was high throughout the organisation (Infinity Solutions, 2002).

Survey respondents indicated that the strongest cultural factors for facilitating knowledge sharing in their organisations was having individuals who were willing to share their knowledge with other staff, and sharing knowledge with other organisations where appropriate. The weakest cultural factors for facilitating knowledge sharing were in relation to linking knowledge management to individual performance, knowledge sharing being rewarded within organisational remuneration and reward systems, and knowledge sharing being measured within organisational performance management systems (Infinity Solutions, 2002).

Findings from the survey conducted by Infinity Solutions in 2002 revealed that, of the responding organisations, 20% had a formal knowledge management strategy, 47% had an informal knowledge management strategy and 33% had no knowledge management strategy. Organisations with either an informal knowledge management strategy or no strategy reported that knowledge management initiatives had been moderately successful, whereas organisations with a formal knowledge management strategy tended to find knowledge management initiatives had either successfully or very successfully met their business needs (Infinity Solutions, 2002).

This suggested that, for the organisations surveyed, having a knowledge management strategy had been an ingredient in successfully implementing a knowledge management initiative.

2.6.4 Findings Regarding Knowledge Management in the State Sector

As more public sector knowledge, information, and services become accessible to the public through IT channels, governments and their agencies will have to change the way their businesses are carried out to respond to this. State sector organisations are likely to increasingly be expected to share their knowledge and expertise with clients they serve and with other related agencies alike. This will present a number of challenges in both technological and cultural areas.

Many State sector agencies have operated for numbers of years as monopolies where they have guarded and protected their specialist knowledge. Any movement to recognising their knowledge as an essential public good could potentially take a large paradigm shift. Yet knowledge management may offer a way for State sector agencies to capture and share their knowledge in a whole-of-government or integrated manner.

The current Government is expecting the State sector to play a large role in moving New Zealand into being a knowledge-based economy. Although there has been significant change in the State sector in the last 20 years, there is a feeling that the sector has to become even more innovative and productive in the future.

The current Government's exploration of creating a knowledge-based economy has seen the introduction of the "Knowledge Wave Conferences", where a cross section of society has come together to determine how value can be maximised from New Zealand's collective knowledge. Ideas have been put forward as to how society as a whole ought to cultivate, disseminate and use knowledge to grow New Zealand's

economy; that is, how knowledge management tools can be put into practice to aid a whole country.

The current Government is also expecting State sector agencies and organisations to work more effectively together and collaborate more with each other, and with stakeholders and customers. It sees this goal as increasingly being delivered though its e-Government initiative.

It is anticipated that the Internet will be the key platform for public sector service delivery by 2010. By this point in time, New Zealand citizens are likely to expect that State sector knowledge, information and expertise will be readily available, easy to access, and holistic and will genuinely add value to them.

This presents challenges for State sector organisations. State sector organisations are going to have to be comfortable about sharing their knowledge and information with clients, fellow agencies and other groups like non-Government organisations. Without some level of trust, it is likely that State sector agencies will be reluctant to share their knowledge. However, the Government's e-Government initiative may well compel them to perform this.

These State sector organisations are going to have to have compatible technology systems or a common platform where knowledge and information can be easily transmitted and exchanged, but remain secure.

The knowledge and information made available by the State sector should fit the aims of maximising society's overall knowledge to benefit all and advance the Government's knowledge based economy objectives. Put simply, it should add value. It would appear that knowledge management has a part to play in helping State sector organisations deal with this environment and the expectations placed upon them by the Government to deliver e-Government solutions.

2.7 Key Conclusions Arising from the Review of Literature in the Field

2.7.1 Introduction

This review of literature in the field has been undertaken in part to aid the examination of the role that knowledge management plays in New Zealand State sector organisations to ascertain if they can potentially gain advantages from adopting knowledge management, as well as discovering how New Zealand State sector organisations benefit from using knowledge management. In addition, it has been carried out to determine what the key findings and learnings from other knowledge management research has been and to explore what the current state of literature in the field is around knowledge management and its use.

The review of literature in the field has also been used to determine what the shape and scope of subsequent research in the field (associated with this thesis) ought to take, along with the important themes and concepts this field research should subsequently test or provide further evidence on.

In order to examine the role that knowledge management plays in New Zealand State Sector organisations, to determine the advantages they may gain from adopting knowledge management, and to discover how they benefit from using knowledge management, the following framework was adopted to guide supporting research:

- Considering how is knowledge created and used in organisations?
- Determining what are the commonly used and researched approaches to developing and implementing knowledge management initiatives?
- Determining what use of knowledge management is made in a range of New Zealand State sector organisations?
- Assessing whether New Zealand State sector organisations can learn from the development and implementation of knowledge management initiatives that have already been undertaken in the State sector?

The review of the literature in the field was carried out to particularly provide assistance in answering the first two questions given above. It was recognised that there is very little published research about knowledge management's use in New Zealand, and little material publicly available about knowledge management

initiatives which have been carried out in New Zealand State sector organisations.

Hence, it became clear that this thesis would in part have to be focused on collecting material which could aid the answering of the two latter questions, along with testing ideas about key concepts, and filling in gaps in understanding about knowledge management and its use.

2.7.2 Considering How is Knowledge Created and Used within Organisations?

The literature in the field suggests that, while it is possible to manage knowledge-related processes such as organisational knowledge-creation processes, it is not possible to manage knowledge itself (Nonaka & Takeuchi, 1995 and Von Krogh, Ichijo & Nonaka, 2000). This is something that all organisations that implement knowledge management initiatives need to understand.

Organisations carrying out knowledge management work may believe that it is possible to manage knowledge, without necessarily understanding what organisational knowledge consists of, and also not being aware of how knowledge is created in the organisation itself. Therefore, the field research to be carried out needed to begin with testing in the organisations studied as to whether they consider that organisational knowledge can be managed or not. As a contrast, it would also be useful to test with them if they consider that information, along with data, can be managed.

To gauge if organisations see knowledge as being part of a continuum that extends from data, information and knowledge, or as separate ideas, organisations studied would also be asked about the relative value they place on these. This is important given the suggestion from the literature that knowledge management initiatives often fail as organisations undertaking them were not aware of the knowledge that was critical to the business or did not understand what data, information and knowledge staff needed to perform their jobs.

An area where a greater understanding of organisational knowledge is needed for this research study is determining how organisations identify what is critical organisational knowledge in terms of knowing what knowledge is essential to the organisation and how it operates.

The review of literature in the field also suggested that having a vision for the use of knowledge within organisations was important, and that this should be embodied in a knowledge strategy or the overall group of strategies/strategic direction of an

organisation. This is a theme that merits closer examination to determine if organisations that undertake knowledge management initiatives carry out such actions, and the effects this has had.

An additional idea also to be explored in field research is whether knowledge is referred to or contained within organisational objectives. This would gauge if organisations see knowledge as an important ingredient in supporting the achievement of organisational objectives or delivering superior organisational performance.

One of the significant ideas which occurs in the literature of the field is that organisational cultures have to be such that knowledge creation and sharing can be supported. This raises the questions of whether organisational cultures and norms have to be altered in organisations implementing knowledge management initiatives to support this work, or whether organisations with cultures which support knowledge creation and sharing are better suited to implementing knowledge management initiatives, than those without these supporting characteristics.

These ideas suggested that field research should also explore whether organisational culture and norms in studied organisations support knowledge sharing and creating behaviours, as cultural implications such as these need to be carefully considered by organisations when implementing knowledge management initiatives. For example, cultural barriers such as reluctance to share knowledge, the lack of a knowledge-friendly or knowledge-sharing culture, and the lack of trust in an organisation are said to impede knowledge management initiatives.

These cultural barriers are linked to the fact that knowledge is embedded in people, and to knowledge sharing being a social interaction process. It should not be overlooked that, due to its nature, knowledge cannot be easily manipulated, stored and used unlike parcels of data or information. The literature in the field points out the organisations that have been down the track of implementing knowledge management initiatives and discovered too late that neither their culture nor structures supported such work.

There is also greater recognition and awareness that knowledge creation and sharing are inherently social processes. Organisations are likely to increasingly search for ways to promote organisational knowledge sharing in the future.

Techniques and forms that can assist with knowledge sharing range from encouraging informal communities of practice through to using storytelling techniques. A constant challenge for organisations will be to develop knowledge management initiatives that support organisational knowledge creation and sharing processes.

The literature review places a strong emphasis on the need for organisations to support social processes and to provide a context or place where knowledge can be shared, created and used. Given these conditions, it would be interesting to discover if organisations that implement knowledge management initiatives provide for knowledge-sharing processes and encourage their staff to share what they know. The field research also explores this point.

There is a question around whether knowledge and knowledge work can or should be managed. Tacit knowledge is difficult to access and share, and there are ethical implications about tapping into individuals' tacit knowledge.

Organisations need to carefully consider if knowledge management initiatives should focus on capturing and sharing explicit knowledge and aiding the sharing of tacit knowledge. It may not be possible or desirable to capture or formalise all tacit knowledge residing within an organisation.

2.7.3 Determining What are the Commonly Used and Researched Approaches to Developing and Implementing Knowledge Management Initiatives?

One of the issues raised by Von Krogh, Ichijo & Nonaka (2000) is that organisations should take time to consider what knowledge means to them, in the context of their organisation. This raises a question around whether every organisation that is planning to undertake knowledge management work should consider what knowledge means to them, particularly before they begin any other work; ie, should this be the first step in a knowledge management programme?

Once organisations have considered what knowledge means to them, it would be interesting to know if they can then apply their definition of knowledge practically; ie, once they have identified what knowledge is, how would they ensure that this is commonly understood within the organisation and how would they apply this concept of knowledge on a practical basis? Would they treat organisational knowledge differently having defined it?

Following on from this issue, it would be useful to know if organisations implementing knowledge management initiatives draw distinctions between data, information and knowledge. Given the lack of clarity around defining knowledge and issues of knowing how it differs from information, it would be beneficial to see if knowledge management practitioners and organisations that have implemented knowledge management initiatives see the distinction between data, information and knowledge as clearly as researchers and management writers, and if they consider this important in carrying out knowledge management work.

In a similar vein, literature in the field raised that there is no one agreed definition of knowledge management. The field research explores the meaning of knowledge management with research participants to gauge how their organisations view the term knowledge management and what it is understood to represent.

Some knowledge management writers believe that the best place to start a knowledge management initiative is to develop a knowledge management strategy (Earl, 2001). It is considered that such a strategy has to be developed by an organisation itself, as only the organisation can be aware of the importance organisational knowledge plays.

Any knowledge management strategy adopted, like knowledge management initiatives, needs to be championed and led from the top of the organisation to be successful. Without this level of commitment and buy-in from senior management, there is a danger that the knowledge management initiative will not succeed. This concept is explored with research participants.

The survey conducted by Infinity Solutions (2002) seems to suggest that organisations with knowledge management initiatives that had developed knowledge management strategies had tended to achieve more success in their knowledge management work than those organisations without knowledge management strategies. It was considered useful to explore if this holds true for New Zealand State sector organisations that have implemented knowledge management initiatives.

Given that the literature review suggested that IT tools and systems can have only a limited role in knowledge management, by supporting the sharing and transferring of knowledge, it would be useful to know if organisations with knowledge management systems think that they deliver benefits. It was noted from the literature that much of the approach to knowledge management has focused on knowledge management systems and tools.

The literature review revealed that organisations have to think about the type of knowledge they should capture in knowledge management systems. It has been found that many businesses are gathering data, information or knowledge which doesn't get used, because organisations didn't find out what knowledge or information was critical to business success or needed by staff. In this context, knowledge captured in knowledge management systems has to be relevant to its users.

It would be useful to know if organisations only store knowledge and information in knowledge management systems or actually use a wider array of storage systems. In addition, it would also be useful to know how much use this material receives once it has been included in a knowledge management system. Furthermore, it was suggested in the literature in the field that organisations often don't know what knowledge and information is critical to their operations.

Organisations should have some idea that the knowledge and information they collect in knowledge management initiatives and systems is what the organisation needs. This is further explored in the field research.

The literature in the field does not indicate what timeframes are used in terms of the time it takes to go from initiating to implementing a knowledge management initiative. As time can be a critical criterion in assessing whether knowledge management initiatives are entered into, this is explored with participating organisations in the field research.

It is also advocated in the literature in the field that the most common form of knowledge management systems are knowledge maps and knowledge repositories. However, given New Zealand is said to be in its infancy with knowledge management's adoption, it would be useful to know if this case applies to New Zealand knowledge management initiatives implemented in the State sector.

As the New Zealand market for knowledge management is relatively young, it was considered advantageous to determine if New Zealand State sector organisations with knowledge management initiatives had chosen to either make or buy knowledge management systems, and whether they had engaged external assistance in developing and implementing knowledge management initiatives. This would provide a useful insight into knowing how New Zealand State sector organisations tend to approach knowledge management work.

Leadership and support from the top of the organisation has been identified as an element that must be present in every successful knowledge management

initiative. It would be useful to know if this is also true of New Zealand State sector organisations.

An important aspect raised throughout the review of literature in the field was that leadership is critical not only for influencing the creation and sharing of organisational knowledge, but also for the overall success of knowledge management initiatives. Lack of senior management buy-in into knowledge management initiatives is said to be one of the key barriers impeding knowledge management initiatives.

It would be useful to test if these circumstances around leadership support held true for the New Zealand State sector organisations that have implemented knowledge management initiatives. Accordingly, the extent of leadership support for knowledge management initiatives is further explored in the field research.

2.7.4 Determining What Use of Knowledge Management is made in a Range of New Zealand State Sector Organisations

In the New Zealand context, the current Government has implemented a range of activities to promote New Zealand becoming a knowledge-based economy. This presents challenges as to how New Zealand society as a whole cultivates, disseminates and uses knowledge. The current Government is expecting the State sector to take a lead in this. It is also expecting that the Internet will be the key platform for the delivery of government services in New Zealand by 2010.

In this regard, New Zealand citizens are likely to expect that State sector knowledge and information will be readily available, and well integrated (in that it may represent material about the same issue that could be managed by several government agencies). This means that State sector organisations need to consider how they manage their knowledge and information, along with what sorts of tools and techniques they need to implement to support this aim.

As highlighted by the OECD (2001), internationally Government sector organisations risk falling behind the private sector in terms of the pace for adoption of knowledge management. The extent and timeframe for adopting knowledge management by New Zealand State sector organisations is explored further in the discussion of field research results.

2.7.5 Assessing Whether New Zealand State Sector Organisations can Learn from the Development and Implementation of Knowledge Management Initiatives that have already been Undertaken in the State Sector

As highlighted earlier, there is little published research regarding the adoption and implementation of knowledge management initiatives by New Zealand State sector organisations. Therefore, it is necessary to conduct field research as part of this thesis to ascertain the current state of knowledge management's use within the New Zealand State sector.

This further research seeks to determine what the important learnings have been in the organisations that have carried out knowledge management work to date. The research undertaken would add to the understanding and knowledge about knowledge management's use in New Zealand, and also compare and contrast the knowledge management initiatives undertaken in State sector organisation to date.

These issues and gaps raised and discussed in this overall section are further explored and expanded on in the sections that follow. In particular, the research methodology, together with key questions posed in field research and identified gaps and issues to be explored further in field research, are included in the next section (Section 3).

Findings from the research conducted in the field are presented in Section 4, then the findings from the review of literature in the field (Section 2) are compared and contrasted with research findings gathered for this thesis in Section 5.

2.7.6 Areas for Future Research

There is a question or assumption that without chief executive or leadership level of support, knowledge management wouldn't be effective or not actually started by an organisation. Although it is outside of the scope of this thesis, it would be useful to know how many knowledge management initiatives have begun and subsequently fallen over due to lack of chief executive buy-in.

The literature review also highlighted the need to shape organisational structures around supporting knowledge creation, along with the potential need to alter organisational reward systems in order to support knowledge sharing. Although these issues are beyond the ambit of this thesis, they do represent issues that could be further researched, to gauge how often organisations which are

knowledge-centric do actually alter their structures and infrastructures to support the creation and transfer of knowledge.

Another allied area raised through the review of the literature in the field was the idea of care having to exist in organisations to support knowledge sharing. Again this level of detail around understanding the nature of knowledge sharing is beyond the ambit of this research, but an area for further research would be to explore how the idea of care is regarded in organisations, particularly those implementing knowledge management initiatives, to see it this idea has merit or recognition in organisations and is taken into account for knowledge management work.

SECTION 3 – RESEARCH METHODOLOGY

3.1 Introduction

The purpose of this section is to describe the research methodology used to examine the role that knowledge management plays in New Zealand State sector organisations, to ascertain if they could potentially gain advantages from adopting knowledge management. In addition, as this thesis is also aimed at discovering how New Zealand State sector organisations benefit from using knowledge management, the research methodology used to determine this is also included in this section.

To achieve these goals and aims for this thesis, the following framework was adopted to guide supporting research:

- Considering how knowledge is created and used in organisations.
- Investigating different approaches to developing and implementing knowledge management.
- Investigating the use of knowledge management in a range of New Zealand State sector organisations.
- Determining if New Zealand State sector organisations can learn from the implementation of knowledge management initiatives that have already been undertaken in the State sector.

The research methodology selected for this research study to support the overall thesis involved the qualitative technique of conducting in-depth, semi-structured interviews. These interviews were designed to give a detailed understanding about what had occurred in selected New Zealand State sector organisations regarding knowledge management initiatives.

The information collection methodology associated with the interviews involved using a range of open-ended and close-ended questions, included within an interview guide or questionnaire. Interviewees' responses to these questions were then compared and contrasted to give an overall picture about how knowledge management initiatives had been developed and implemented, along with the lessons learned through carrying out this work in the organisations studied. These matters are discussed in more detail in the material that follows.

3.2 Research Methodology Concepts

3.2.1 Information Collection Method

In order to collect information to help determine if New Zealand State sector organisations do or can benefit from using knowledge management, it was considered that the qualitative research technique of conducting interviews would be most appropriate.

Interviewing as a technique is said to have the strengths of obtaining large amounts of expansive and contextual material and data quickly, providing background context for more focus on activities, behaviours and events; and also providing participant's perspectives on ideas and events (Marshall & Rossman, 1999). On the other hand, the weaknesses of interviewing include: depending on the co-operation of a small group of key informants or participants; data collected being subject to observer effects; and depending on the researcher's ability to be resourceful, systematic and honest to control bias (Marshall & Rossman, 1999).

On balance, it was considered that conducting interviews would allow for the gathering of detailed information about how organisations had gone about their knowledge management initiatives in a manner that could allow for cross-analysis and comparison between very different organisations. This qualitative technique would give an in-depth and detailed understanding about what had occurred in selected State sector organisations around knowledge management work.

The types of interviews available offered a wide range of possible research options to be pursued (Hughes, 2002). In particular, there is a continuum of interview types, which spans from structured interviews through to unstructured interviews (Minichiello, Aroni, Timewell & Alexander, 1990). Structured interviews can be seen as featuring pre-determined, standardised questions, such as those that are used in survey or opinion polls. In contrast, unstructured interviews don't use pre-determined questions or interview guides, relying solely on the interaction between interviewer and interviewee during a controlled conversation. The midpoint between these two forms is the focused or semi-structured interview, which features using an interview guide or questionnaire that sets out a list of topics (Minichiello et al, 1990).

However, some types of interviews were discounted for this thesis because of their limitations. Unstructured interviews would not have lent themselves to robust cross-analysis, while telephone interviewing would not have allowed for the same

level of rapport to be developed with interviewees as face-to-face interviews, and survey or opinion polls would have been difficult to arrange given the relatively small number of people involved with knowledge management initiatives across the New Zealand State sector.

Therefore, it was considered that the most applicable type of qualitative research technique and interview method was in-depth interviews using a semi-structured format for questions. These allow for intensive questioning to occur in order to gather significant amounts of information on the interviewee's views about the research subject (Benjamin & Moore, 2002). Initial questions can be general or broad, then go into more detail about given research topics.

In-depth interviews have the advantage of giving the researcher the greatest opportunity to find out what an interviewee thinks or feels about a given topic, along with their attitude (Benjamin & Moore, 2002), and to find out how the interviewee reacts to various situations and issues. Thus, this research technique offered the best way to explore a number of issues in-depth, such as: gauging the value organisations give data, information and knowledge; finding out about how well organisational cultures support the use and sharing of organisational knowledge; and looking at how organisations manage, store and use information and knowledge, in some depth.

In this regard, it was possible to devise and develop an interview guide/questionnaire which focused on: exploring how knowledge is created and used in organisations; investigating different approaches to knowledge management and its implementation; investigating the use of knowledge management in a range of New Zealand State sector organisations; and determining what lessons can be learned from organisations that have already implemented knowledge management initiatives.

3.2.2 Defining Interview Question Types

A number of possible interview questions were considered to assist with collecting information. Patton (1990) suggests that the following types of questions can be asked in interviews:

- Experience/behaviour questions: based on what a person does or has done.
- Opinion/value questions: to understand the cognitive and interpretative processes of people.

- Feeling questions: to understand the emotional responses of people to their experiences and thoughts.
- Knowledge questions: to discover factual information the respondent has.
- Sensory questions: questions about what is seen, heard, touched, tasted and smelled.
- Background/demographic questions: to identify characteristics of the person being interviewed.

Each of these question types were considered in terms of applicability to this research study, and a number of interview question groupings were devised to cover Patton's (1990) schema. These groupings formed a framework of research themes including:

- General introductory questions to set the scene about organisations and their views on data, information and knowledge.
- Questions about organisational culture including knowledge-sharing behaviours and culture changes needed to support system changes, along with chief executive support for the knowledge management work.
- Questions about the storage and use of knowledge and information within organisations.
- Questions about specific knowledge management initiatives undertaken.
- Concluding questions to gauge lessons learned in the selected organisations regarding knowledge management initiatives.

Consideration was also given to question forms. The two most commonly used question structures in interviews are closed-ended questions and open-ended questions. Closed-ended questions can be described as being those questions in which an interviewee is asked to choose between several pre-determined answers – yes, no or don't know types of response (Minichiello et al, 1990). These tend to be inflexible, but allow for easy analysis and interpretation.

Open-ended questions are questions in which the interviewer asks the interviewee what he or she thinks or feels about a given topic or situation, such as "how would you rate..." (Minichiello et al, 1990). The researcher takes notes in response to this and can ask further or subsequent questions to the original one posed. However, this can complicate data collection and analysis.

It was considered that, for the planned interviews to be held to aid this research study, there should be a mixture of both closed-ended and open-ended questions included in the interview guide/questionnaire. Closed-ended questions would indicate an initial yes or no answer, to quickly ascertain whether certain conditions applied for the organisations studied. Open-ended questions as appropriate would then allow for the interviewees to go into some depth to explain what had occurred in their respective organisations. This form of questions would also allow for questions aimed at recording interviewees' impressions and values about certain topics.

Potential questions were grouped into the research themes given above and clustered around closed-ended questions. Then open-ended questions were added that had subsequent follow-up topics, which would elicit more information about choices made, the progress of events and other supporting material which would go some way to explaining why events had or hadn't occurred in the organisations studied. This mixture of question types allowed for depth to be built into focused areas to gain an appreciation for what had occurred in individual organisations, while also allowing the researcher to be able to compare and contrast events and opinions collected from across the organisations researched.

3.2.3 Interview Guide/Questionnaire Preparation

Once overall interview question groupings were identified around common research themes (including introductory questions, organisational culture questions, questions about the storage and use of knowledge and information, questions about specific knowledge management initiatives and concluding questions), and question forms and types considered and selected, individual questions were then developed around broad categories. These individual questions were then tested for robustness and to ensure that they were clear in terms of intent.

The developed questions fell into the following four broad categories:

- Closed-ended questions which began with yes or no responses that then led to subsequent follow-up open-ended questions, where interviewees were asked to give more explanation around initial responses. These questions were devised to gather in-depth information about sequences of events or greater detail about what had happened in organisations studied.

- Questions which were targeted towards getting interviewees' opinions and values on certain statements which interviewees could choose to answer, along a series of responses including *strongly disagree*, *disagree*, *neutral*, *agree* and

strongly agree. These were devised in order to make comparisons on value statements between organisations taking part in the study.

- Questions that gave interviewees a list of pre-set responses they could either tick or cross according to their applicability. These were devised to find out about certain knowledge management tools and methods used in organisations studied.

- Appropriate opening and closing interview questions were also asked to mark the start and end of the interview. The opening question began with establishing the purpose of the organisation researched and the closing question was used to check if participants had any other comment they wanted to make about their organisation's knowledge management initiative which had not been touched on during the interview.

An overall interview guide or questionnaire form was then prepared that covered the question groupings shaped around the research themes highlighted in 3.2.2 and was made up of the four broad categories of questions outlined above. Interview guides are said to list general issues the interviewer wants to cover in an interview (Minichiello et al, 1990).

The overall groups of questions included in the questionnaire were anticipated to give an indication about how New Zealand State Sector organisations manage their knowledge and information to support wider government aims in regard to promoting the development of a knowledge-based economy. They were also designed to enable the comparison and contrast of knowledge management initiatives undertaken in New Zealand State sector organisations. Refer to Appendix 1 for the actual interview guide/questionnaire. The types of questions prepared and included in the questionnaire are discussed below.

- **Overall Introductory Questions**

  In the general introductory section of questions about the importance of data, information and knowledge to the organisations studied were included. This question group was focused at generally exploring how these concepts are viewed.

  As the review of the literature in the field revealed that it is not possible to manage knowledge itself (Nonaka & Takeuchi (1995), questions were included to find out interviewees' views on the ability to manage organisational knowledge. To round these views out, questions were also included about

organisational ability to manage information and data.

Literature in the field also revealed that having a strategy to manage knowledge can be an important ingredient in knowledge management initiatives (Infinity Solutions, 2002) and the knowledge creation and transfer processes (Nonaka & Takeuchi, 1995 and Von Krogh, Ichijo & Nonaka, 2000). The work of Earl (2001) also pointed to the possible saving that can be made from beginning a knowledge management initiative with a knowledge management strategy.

Therefore, questions were included around determining if organisations had knowledge management strategies and/or information management strategies, and if these were linked to overarching organisational objectives or strategies.

To gauge the overall extent of how IT or knowledge management systems were seen to support the achievement of strategic directions or organisational objectives (and act as knowledge sharing and transfer enablers), questions were also included to explore these matters with interviewees.

- **Questions about Organisational Culture**

From the literature review, the work of Nonaka & Takeuchi (1995) and Nonaka, Toyama & Nagata (2000) emphasised the need to understand the social interaction processes in the transfer and creation of organisational knowledge, along with having organisational cultures which support knowledge sharing and transfer (Nonaka, Toyama & Nagata, 2000 and Bock, Zmud, Kim & Lee, 2005). A range of questions was therefore included in the interview guide or questionnaire about organisational culture and cultural changes arising from the introduction of knowledge management initiatives.

The literature in the field also highlighted the need for leadership support for knowledge management initiatives (Holsapple & Joshi, 2000b and Nonaka, Toyama & Nagata, 2000). Accordingly, questions were included within the questionnaire to find out about chief executive level support for knowledge management initiatives in the organisations included in this research study.

- **Questions about Knowledge and Information Use and Storage**

Another range of questions included within the interview guide or questionnaire was about the storage and use of knowledge and information within organisations. This was particularly aimed at ascertaining if the organisations taking part in this research study were aware of what knowledge and

information is critical to their success, and could also distinguish if it was contained within organisational knowledge and information stores.

Questions were also included around establishing how organisations determine that the knowledge and information captured in knowledge management systems is what the organisation needs. The review of the literature in the field disclosed that knowledge management initiatives often don't succeed because those involved with developing and implementing knowledge management initiatives failed to ask organisational staff what knowledge and information was needed by them in carrying out their jobs (McCune, 1999, and Damodaran & Olphert, 2000).

- **Questions about Specific Knowledge Management Initiatives Undertaken**

It was considered important to determine the drivers that led organisations studied to undertake knowledge management initiatives. This was considered important to explore primarily to determine if organisations see knowledge management as a key in managing the creation and transfer of organisational knowledge.

Additional questions were also included in the questionnaire around the timeframe and stage of development that organisational knowledge management initiatives were at, as the literature in the field didn't give an indication of how long organisations should anticipate taking to develop and implement knowledge management initiatives.

A series of questions was included within the questionnaire about the types of knowledge management systems implemented within studied organisations to gauge if knowledge maps and knowledge repositories are the most common forms of systems used, as suggested by the literature in the field. This was considered important, given New Zealand's suggested infancy in terms of the uptake of knowledge management.

Questions were also included in the questionnaire around gauging the extent that organisations studied had used external help to assist them with developing and implementing knowledge management initiatives, and to check if organisations had either made or bought their knowledge management systems. These questions were aimed at looking at potential insights into how New Zealand State sector organisations go about carrying out knowledge management work.

Also included in the questionnaire, within the general category of questions about knowledge management initiatives undertaken, were questions about how much use knowledge management systems get, together with questions relating to determining how knowledge captured in knowledge management systems is kept up to date. These were included to check and see if organisations studied know if their organisational knowledge is kept up to date and is current.

- **Concluding Questions**

  The last group of questions included within the interview guide or questionnaire related to the lessons learned by New Zealand State sector organisations in carrying out knowledge management work. These included gaining insight into the positive and negative aspects of the knowledge management initiatives undertaken in studied organisations. The purpose of these questions was to ascertain what the important learnings have been in the organisations that have carried out knowledge management work to date.

  Questions were also included in this section of the questionnaire to determine if organisations had valued the knowledge management initiatives undertaken, and to find out if organisations would take alternative routes or actions if they had the opportunity to repeat their knowledge management work again.

In summary, the interview guide or questionnaire was developed to cover the areas discussed above to add to the understanding about knowledge management's use in New Zealand State sector organisations. As pointed out in the literature review, there is little published material available about this.

3.2.4 Selection of Organisations to Participate in Field Research

State sector organisations were selected for participation in this research study on the basis that they had indicated in their Annual Reports and/or Statements of Intent[5] that they had been carrying out some type of knowledge management work, or were looking at ways of managing their organisational knowledge, or had suggested that knowledge was seen as an organisational asset.

A total of thirteen State sector organisations were initially selected and considered appropriate to contact in relation to becoming part of this research study. These

[5] Which are both publicly available accountability documents.

organisations were all contacted and were invited to participate in the study (refer to Appendix 2 which includes a research study introduction letter).

Four State sector organisations initially contacted chose not to take part in this research study, largely for the reasons that their knowledge management work was not far enough advanced to be of useful comparison, or that they considered that they were not doing enough in terms of knowledge management work to merit inclusion in the study. Two of the State sector organisations initially selected as potential participants had been merged together at the time contact was made for in-depth interviews. In total, eight New Zealand State sector organisations took part in this study.

3.3 The Research Process Undertaken

3.3.1 Contact made with Organisations

Each organisation identified as a potential candidate for inclusion within this research study was contacted separately and permission was requested to conduct an interview with appropriate people nominated by the organisation. Most organisations contacted responded to the researcher directly, but follow-up telephone calls were made where necessary with organisational representatives (to request permission to conduct interviews and to find out who would be appropriate to interview).

As highlighted by Hughes (2002) and Bell (1999) getting access to interviewees did have an influence on the interviews, as representatives of organisations contacted selected who in the organisations would take part. This meant that potential interviewees spanned wide-ranging roles in selected organisations from Chief Knowledge Officers to knowledge architects.

All interviews were arranged at mutually convenient times, for an initial interview lasting no more than an hour. Bell (1999) suggests that interviews should not extend beyond 60 minutes and that the interviewer should pay attention to ensuring that they don't exceed this.

An information sheet was prepared giving an outline of the research study and its purpose (refer to Appendix 3 for the information sheet). These information sheets were forwarded to each interviewee prior to the interview being held. In addition, interviewees were either sent a copy of the interview guide/questionnaire in advance of the interview or were given a copy when the interview commenced.

Also prior to each interview being held, the researcher gathered general background information on each organisation to be studied, as recommended by Hughes (2002). This gave the opportunity to provide a context for comparing and contrasting studied organisations.

3.3.2 Conduct of In-Depth Interviews

The interviews were held between February and April 2004. Each in-depth interview held began with interviewees being asked to sign a prepared consent form for each of the interviews (refer to Appendix 4 for the consent form). This consent form outlined the interviewees' participatory rights and also recorded if the interviewee had agreed to the interview being audio-taped.

The purpose of the interview and the research study's aims were introduced at the beginning of each interview held, as recommended by Hughes (2002). The format and process for how the interview would be conducted was also raised with each interviewee to ensure that they understood and were comfortable with what was proposed. This also helped build rapport with interviewees, which is an important factor for interviews (Minichiello et al, 1999 and Hughes, 2002).

All interviewees included in this study gave their permission for interviews conducted to be recorded onto audio-tape. Interviewees were also informed that they could ask that the audio-tape recording be stopped at any time at their request. An audio-tape recording was made of each interview to supplement note taking. This was carried out to provide greater objectivity in data recording, as recommended by Benjamin & Moore (2002).

The researcher filled in the interview guide or questionnaire as each interview proceeded and also took notes of what was being said during each interview. Interviewees were advised that the audio-tape recording would only be used as a back up to support notes taken during the interview, in case any issues were missed or points of clarification were needed about responses given to questions.

Hughes (2002) warns that, in answering questions, interviewees might raise issues that the interviewer would challenge in the course of a conventional conversation. However, he stresses that the nature of interviews means that the interviewer has to listen to the interviewee's view and appear to remain neutral about what is being raised (Hughes, 2002). This approach was taken by the researcher to prevent personal bias entering the interviews.

Most of the interviews held lasted about an hour in total as recommended by Bell (1999) and Benjamin & Moore (2002), and were conducted according to the order of questions included in the interview guide/questionnaire. Interviewees were also advised that, if they had any concerns about the conduct of the research, they could contact an appropriate member of the Massey University Human Ethics Committee to discuss their concerns. They were also provided with contact details for this person.

3.3.4 Evaluation of Results

The researcher took the verbal responses given and recorded against questions asked during the interview from the interview guide/questionnaire, together with other notes taken during the interview, and formed an overall interview outline for each interview held. The researcher also transcribed the audio-tape recording of

each interview, particularly to assist in areas where gaps in the notes or interview guide/questionnaire were later found.

The eight interview outlines prepared, along with the transcripts for each interview, were analysed to compare and contrast responses to groups of questions included in the interview guide or questionnaire. Broad subject categories were formed around central research themes, and more detailed analysis carried out for each theme (Benjamin & Moore, 2002). Miles & Huberman (1994) suggest that there are five key stages associated with analysing qualitative data:

1. Collection of data
2. Reduction of data
3. Display of data
4. Drawing conclusions
5. Verifying findings.

The researcher used this process to analyse and interpret interview data for this research study. The outcomes and results from this work are included in Section 4.

3.3.5 Problems Encountered and Overcome

One of the potential problems raised in this research study was ensuring that interviewees had a common understanding and view around the distinction between the terms data, information and knowledge. This was particularly important as questions included in the interview guide/questionnaire were targeted towards drawing out if these are viewed in organisations in distinct ways and the values placed upon them in organisations.

To overcome any potential confusion about what interview questions were driving at, each interview began with a discussion led by the researcher about the meaning given to the terms data, information and knowledge for the purposes of this research study.

These terms were defined as follows (as given in Section 1):

- **Knowledge** – Information that has been fused and blended with understanding, awareness, context, purpose and expertise that enables someone to take action.[6]

- **Information** – Data which has relevance, purpose and context added to it.

- **Data** – Objective facts or records about an event.

Interviewees were advised about the distinction between these terms and referred back to these working definitions during the course of the interview, where necessary.

3.3.6 Ethical Issues Surrounding the Research Undertaken

Another issue encountered during the conduct of the interviews was that the researcher is employed by a business consulting company, and during the course of an interview it was discovered that one of the organisations taking part in the study has engaged a competing business consulting company to assist with their knowledge management initiative. The researcher told the interviewee that the information obtained from the project would only be used in conjunction with this study or with any publication that may arise out of it.

It was also explained that, once information had been obtained, it would be analysed by the researcher, who would compare and contrast it with other information to diagnose key trends and findings. These findings and conclusions would then be incorporated into the Master's thesis itself, which would be held by the researcher and Massey University.

3.3.7 Unexpected Directions the Research Took

An unexpected outcome from conducting the research was the need to alter the working definition used by the researcher to explain what knowledge is, after having gained more insight into the nature of knowledge. In particular, during the discussions held about the working definitions being used in the research study, it was commented on more than one occasion that knowledge has a unique characteristic which allows for one person to readily accept the experiences and

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[6] This working definition was refined and changed after the interviews had been held, as earlier alluded to. The revised working definition became *information that has been fused and blended with experience, understanding, awareness, context, purpose and expertise that enables someone to take action.* A greater discussion of this definitional issue is included in Section 5.2.1.

insight of another person, together with their own experiences and insights, and use this for action. This definitional issue is discussed in more detail in Section 5.2.1.

This was an important insight into the nature of knowledge that had not been previously included in the working definition for knowledge used by the researcher. As a result of discovering this, the working definition used in this thesis to describe knowledge was changed to include the word 'experience'.

SECTION 4 – RESULTS

4.1 Introduction

The review undertaken of literature in the field revealed a number of key concepts, and conclusions about knowledge management. These ranged from considering how knowledge is created and used in organisations, looking at the form and role of knowledge management systems, and investigating the use of knowledge management in the State sector. The literature review also highlighted the New Zealand context regarding the role that the government sector is expected to take in relation to knowledge cultivation, access and use to promote a knowledge-based economy.

From these ideas and conclusions discussed in the literature review, the overall shape and content of the subsequent research study was developed. This included considering possible research methodologies that would allow for in-depth material to be collected to explore concepts, findings and conclusions discovered through the literature review to a greater extent. The qualitative research methodology of conducting in-depth interviews was selected as the most applicable research method to achieve this aim.

In-depth interviews were held with representatives from selected New Zealand State sector organisations, which were focused on gathering detailed information over a wide range of topics. These topics spanned from looking at how New Zealand State sector organisations view data, information and knowledge, to finding out how the selected organisations had carried out knowledge management work and the lessons they had learned along the way.

The overall aim of the in-depth interviews was to give a picture in time about what had occurred in a range of New Zealand State sector organisations carrying out knowledge management work, and to provide insight into the experiences shared regarding this work. The interviews held also provided the opportunity to compare and contrast what had occurred across the organisations studied. Results, discoveries and findings gathered during the interview phase of this research study are presented and discussed in this section.

The New Zealand State sector organisations taking part in this research study represented a diverse mix in terms of size and function. The work performed by the organisations included providing policy advice (four organisations) or delivering services (one organisation), or a mixture of both of these activities (three

organisations). The smallest organisation involved had 70 full-time equivalent staff members, while the largest had 4,500 full-time equivalent staff members.

From the overall group of organisations that took part in the research, two policy agencies and one service delivery agency had been early adopters of knowledge management initiatives in the New Zealand State sector. Both agency types had found using knowledge management to be beneficial, although policy agency representatives commented that managing organisational knowledge was particularly important, as policy advice relies heavily on organisational knowledge.

4.3 Data, Information and Knowledge

4.3.1 Defining Data, Information and Knowledge

Each in-depth interview conducted began with an explanation of the terms used in the interview guide or questionnaire. Specifically, the working definitions used for this thesis on data, information and knowledge were outlined. For some interviews this provoked a discussion with interviewees about the working definitions used, and the nature of data, information and knowledge.

Most interviewees accepted or agreed with the working definitions supplied by the researcher. However, some interviewees stated that it was their view that when knowledge was written down or formalised it became downgraded in value and was converted into information; ie, codification of knowledge altered it into information. These ideas about the nature of data, information and knowledge were explored in more depth during the interviews, and findings about these are discussed below.

The difficulties highlighted in the literature review about the inability to distinguish knowledge from information, and the blurring of the boundaries between these two terms (Senge, 1997, Sveiby, 1997 and Stewart, 2001) were borne out in the field research. Specifically, in answering questions about the nature of data, information and knowledge some interviewees commented that it was often difficult to distinguish between knowledge and information in a practical sense.

This was due to there being a blurring of boundaries between what these terms referred to in their organisations, or organisational practices tending to treat knowledge and information as one. Some interviewees considered that it sometimes wasn't meaningful for their organisations to draw a distinction between knowledge and information in terms of practices used to manage knowledge and information.

However, other interviewees considered that it was very important for organisations to define data, information and knowledge for their own purposes, and to have a common understanding about what these terms refer to before undertaking knowledge management work. This was seen as a vital issue, in that these interviewees thought it could be easy to misconstrue what knowledge is without having a shared definition of it or a common understanding about it. There could be a tendency in adopting knowledge management initiatives to capture things of less value than organisational knowledge.

4.3.2 Value of Data, Information and Knowledge to Organisations Studied

The literature review suggested that there is a view held that knowledge is perceived to be the most valued element in a data, information and knowledge continuum (Grover & Davenport, 2001). To test this idea in the research study interviewees were asked questions to rank the importance of each to their respective organisations.

All eight of the interviewees *strongly agreed* that knowledge is very important to their organisation. This validated the initial selection criteria used to choose particular organisations, in that selected organisations were undertaking some form of knowledge management initiative as they saw knowledge as important.

When asked about the value of information, seven of the interviewees *strongly agreed* that information is very important to their organisations, while one interviewee *agreed* that information is very important to their organisation. Six of the interviewees *strongly agreed* with the statement that data is very important to their organisation, and the remaining two *agreed* that data was very important to them.

These results revealed that there is a graduated difference in the value that organisations place on data, information and knowledge. It would appear that knowledge is seen as having more value than information or data in the studied organisations. This would tend to support the idea that there is a value-based continuum used in organisations extending from knowledge to data.

This result can be partly explained by the nature of the organisations involved with this research study. Some interviewees representing the policy agencies studied commented that data was of less importance to their organisation than knowledge and information, given its nature and their organisations' role of implementing policies of the Government of the day and providing policy advice to Ministers. These interviewees tended to consider that knowledge was of primary importance as using, producing and disseminating organisational knowledge was at the heart of creating and providing policy advice.

4.3.4 Ability to Manage Data, Information and Knowledge

When asked the question "in your view, can knowledge be managed?" interviewees taking part in this study had very mixed responses. Four (50%) interviewees

considered that it is possible to manage knowledge outright, while the remaining four considered that, while there are some elements of knowledge that can be managed (ie, explicit knowledge), it is not possible to manage tacit knowledge. They remarked that it is easier to facilitate, harness, direct and develop knowledge than manage it.

Managing knowledge was seen as something akin to managing people for some interviewees, in that they considered that not all aspects of human behaviour could be managed by organisations. Therefore knowledge in its entirety (tacit knowledge and explicit knowledge) could not be managed in the view of these respondents.

These findings in part resonate with the views of Nonaka & Takeuchi (1995), and Nonaka, Toyama, & Nagata (2000). In particular, these writers consider that knowledge outright cannot be managed ie, they don't draw distinctions about the ability to manage either the tacit or explicit components of knowledge.

It was the opinion of three interviewees (37.5%) that, in formalising knowledge, by writing it down or recording it, knowledge's value is largely lost. These interviewees saw this distinctly as a transformation or codification of knowledge into information. That is, knowledge became downgraded or lost important elements through the process of trying to record it or codify it. Human experiences or lessons learned, in particular, fell into this category of being devalued through codification in the view of these interviewees.

However, interviewees did not share the same mixed views about organisational ability to manage information and data. These concepts were seen to be manageable, more tactile and structured than knowledge and therefore much easier to capture. All eight interviewees considered that both information and data could be managed by organisations. All interviewees also thought that it was easier to manage data than both knowledge and information.

4.3.5 Findings About Data, Information and Knowledge

The first key finding uncovered from this study was that interviewees saw knowledge as having more value than either information or data, notwithstanding the issue around distinguishing the difference between knowledge and information. For the organisations studied, knowledge was the most important element in the data, information and knowledge continuum.

This recognition of the importance of knowledge had led the organisations studied into considering ways of maximising its value. This had created a natural platform

or exploration point for knowledge management in the participating organisations.

A useful insight also gained from the interviews held was about having an agreed organisational definition of data, information and knowledge. Some interviewees saw this as an important task to complete at the early stages of knowledge management work in order to avoid later confusion or resource wastage due to the wrong material being collected in knowledge management initiatives.

Another key finding in this area was that interviewees pointed out that tacit knowledge contained in individuals' heads couldn't be easily managed, which is widely recognised in literature about knowledge management (Nonaka & Takeuchi, 1995, and Nonaka, Toyama & Nagata, 2000). It was recognised that it is much easier to manage information and data than it is knowledge, due to their relative tangibility and nature when compared to knowledge.

4.4 Strategy and Knowledge Management

4.4.1 Use of Knowledge Management and Information Management Strategies

Davidson & Voss (2002), Earl (2001) and Hansen, Nohria & Tierney (1999) suggest that a good starting point to begin knowledge management work was to develop a knowledge management strategy.

In order to test out the validity of this idea, interviewees were initially asked whether or not their organisation had developed knowledge management strategies to guide knowledge management work. In response, it was discovered that five out of eight organisations had developed knowledge management strategies, and the remaining three hadn't. Those organisations without current knowledge management strategies have all committed to developing these in the future and they consider knowledge management strategies to be beneficial.

Organisations that had been early adopters of knowledge management initiatives had all used knowledge management strategies successfully to guide knowledge management work. In addition, most organisations have been re-examining or recasting knowledge management strategies to chart future knowledge management work which builds on initial projects undertaken.

These findings concurred with the views of Davidson & Voss (2002), Earl (2001) and Hansen, Nohria & Tierney (1999) about the usefulness of beginning knowledge management work with a knowledge management strategy.

One of the contentions raised by Hansen, Nohria & Tierney (1999) and Earl (2001) is that it is important to integrate or co-ordinate knowledge management strategies (or information management strategies), wherever possible, with other organisational strategies and objectives in order to reap the value of knowledge. To test this contention, interviewees were asked about the extent to which knowledge management strategies had been integrated with other organisational strategies or objectives in their organisations.

From the group of five organisations that had implemented knowledge management initiatives, two had integrated knowledge management strategies with other organisational objectives and strategies (such as human resource and IT strategies). The remaining three organisations hadn't linked or integrated knowledge management strategies with wider organisational objectives and

strategies. This gave the impression that, on the whole, organisations taking part in the study hadn't found value in integrating knowledge management strategies with other strategies and objectives, or had not considered this important.

This question also revealed a similar proportion of the participating organisations had developed both information management strategies and knowledge management strategies (five out of eight organisations), while three of the organisations hadn't developed information management strategies. Interviewees from the organisations with information management strategies tended to remark that these had been developed some time ago and that current information management strategies are being reviewed, updated or modernised.

4.4.2 IT System Support of Organisational Objectives

To gain a full picture about the extent to which organisations have integrated knowledge management strategies with IT systems, it was considered useful to determine whether organisations had aligned IT systems in general with organisational objectives, to enable their achievement.

Four interviewees *strongly agreed* with the statement that their organisation's existing IT systems support the achievement of organisational objectives, while three interviewees *agreed* with the statement. The remaining interviewee considered that their organisation's IT systems didn't support the achievement of organisational objectives.

This gave a useful insight into finding out about alignment between IT systems and business objectives, particularly to see if organisations view IT systems as an enabler or driver of the business. It also gave a proxy view about how organisations might view knowledge management systems and their relationship to organisational objectives.

Knowledge management literature tends to suggest that organisations that view knowledge management systems as aiding knowledge creation instead of being an enabling tool (Davenport, 2000) are often not successful at implementing knowledge management solutions.

Given that seven organisations taking part in the study either *strongly agreed* or *agreed* that existing IT systems support the achievement of organisational objectives, this situation is not likely to occur. These organisations viewed IT systems as enablers that supported the achievement of organisational objectives.

4.4.3 Reference to Knowledge in Organisational Objectives

Earl (2001) suggests that knowledge ought to be acknowledged in strategic direction material if it is considered important. Therefore, interviewees were asked if a specific reference was made to knowledge in their organisation's organisational objectives (as stated in mission statements, vision statements, strategies or strategic goals). Seven interviewees answered yes to this question. However, only two of these seven organisations had explicitly made reference to knowledge in organisational objectives.

What was revealing about answers to this question was that interviewees who considered that knowledge is implicitly referenced in their organisation's organisational objectives often gave the impression that they thought that knowledge ought to be explicitly included in organisational objectives, particularly after they had rated knowledge as being very important to their organisations. Only one interviewee answered that knowledge was not specifically referenced in their organisation's organisational objectives. It could have been that knowledge was seen as important to the interviewees (particularly if their jobs related to managing knowledge), but that in reality their organisation did not share the same view or did not see knowledge as an important ingredient of organisational objectives.

4.4.4 Findings Regarding Knowledge Management Strategies and Links to Organisational Objectives

Earl (2001), Davidson & Voss (2002), and Hansen, Nohria & Tierney (1999) suggested that a natural starting place for knowledge management initiatives is developing a knowledge management strategy. All of the organisations taking part in this study that had implemented knowledge management initiatives (five organisations) had developed knowledge management strategies as a starting point for their knowledge management work.

The remaining three organisations that didn't have knowledge management strategies are currently developing them, along with knowledge management initiatives. This would tend to suggest that the organisations view the development of a knowledge management strategy as the starting point for knowledge management initiatives.

One of the findings from the literature review was the idea proposed by Earl (2001) that organisations that value knowledge have included particular reference to it in organisational objectives. However, the research revealed that only two of the

eight organisations studied had made a specific reference to knowledge in their organisational objectives, while five interviewees considered that knowledge is implicitly stated in organisational objectives. This tends to point towards the fact that knowledge is said to be highly important to an organisation, but in practice it may not be or it may not receive enough attention to merit inclusion in organisational objectives.

Hansen, Nohria & Tierney (1999) pointed to the need to co-ordinate IT systems and competitive strategies in order to reap the benefits from using knowledge management. Given that the organisations studied don't have competitors as such, it was considered useful to gauge the alignment between IT systems and organisational objectives instead. For most organisations taking part in this study, there is an alignment between IT systems and organisational objectives, addressing the issue raised by Hansen, Nohria and Tierney (1999).

4.5 Knowledge Management Initiative Drivers

There were a number of drivers centred around change that had led the organisations taking part in this study to undertake knowledge management initiatives. Some of these were based around the desire to implement cultural changes, or to counteract loss of organisational knowledge through high staff turnover, or the recognition that organisational knowledge is important, or having a new chief executive head the organisation, or for a combination of these reasons. Examples of these knowledge management initiative drivers are discussed below.

4.5.1 Implementing Organisational Cultural Changes

One organisation had undertaken a knowledge management initiative specifically to effect an organisational culture change. This was primarily aimed at changing the way that work is performed in the organisation along with staff behaviour. In particular, it was recognised that the organisation had always managed its information well, but that a better approach was needed to leverage information and staff members' intellectual capability to collectively produce something better than what could be produced individually.

These ideas echo Nonaka & Takeuchi (1995) and Nonaka, Toyama & Nagata's (2000) view of the knowledge creation spiral in terms of how organisational knowledge is created. In this regard, the organisation wanted to better control knowledge-creation processes within the organisation, and it was recognised that this would involve an organisational culture change. It was considered that knowledge management could help accomplish these aims.

One of the implications of implementing knowledge management meant that staff would have to change the way they worked in terms of managing organisational knowledge-creation processes. This particular organisation had been very clear about what it wanted to achieve from using knowledge management, by focusing its initiative on using knowledge to support and enhance the achievement of the organisation's strategic and tactical goals.

4.5.2 Counteracting Loss of Organisational Knowledge

Two of the organisations studied that have had knowledge management initiatives in place for some time both undertook knowledge management work to counteract the loss of organisational knowledge, caused by significant staff turnover levels.

In one organisation, the movement to centralising operational functions and

downsizing within the organisation resulted in the recognition that most business processes within the organisation were largely paper and people based. This meant that there was a huge variety between regional offices about the type of advice offered and services delivered by staff.

When standardising and centralising functions and business activities, it became obvious that a tool such as knowledge management was needed to support centralised front office services in key centres. In particular, few staff members were supportive of this move from regionally-based offices to urban centres.

To counteract the possible loss of organisational knowledge caused by this lack of support and to speed up the movement to centralised business processes, the organisation started to develop its knowledge management initiative. It primarily began with redeveloping organisational knowledge processes, by developing a knowledge base that would be used as a centrally-based organisational knowledge repository. Staff knowledge-sharing processes and practices were then altered to support this.

The other organisation that implemented a knowledge management initiative based on a concern about loss of organisational knowledge was experiencing high staff turnover rates. Senior managers in the organisation acknowledged that this was a significant problem and began to explore ways to counteract this and retain expertise and organisational knowledge.

It was found that the organisational culture at the time was characterised as being siloed (that is operating in very independent groups). There were also few tools or methods available to staff for searching across the organisation for knowledge or information beyond isolated collections, and poor document management practices. Organisational knowledge was also largely siloed.

One of the solutions explored to address these organisational issues was knowledge management. It was eventually chosen by senior managers as a way of promoting the importance of organisational knowledge, and used as a tool to counteract organisational knowledge loss.

4.5.3 Recognising the Importance of Knowledge

Three organisations involved with this research study had undertaken knowledge management initiatives on the basis of understanding that organisational knowledge is important to the organisation's success.

One organisation studied implemented a knowledge management initiative in recognition that it is a "knowledge- and information-based organisation" and that its staff need to be able to make decisions armed with organisational knowledge and information. It has become increasingly necessary to use knowledge management as a tool for sharing and transferring organisational knowledge and information in this organisation.

For another organisation, its knowledge management initiative arose from the merger of IT and information management functions, and the formation of a dedicated knowledge management team. This occurred when senior managers, recognising the importance of organisational knowledge, promoted its value and decided to undertake knowledge management work to support its use and management.

Again, a third organisation started its knowledge management initiative through recognising the value of organisational knowledge. This organisation had successfully used an information management-based strategy to capture essential information. However, this information strategy had become out of date.

It was recognised within the organisation that the information management strategy needed to be modernised, taking into account that organisational knowledge had an important part to play in carrying out business functions. State sector drivers such as whole-of-Government initiatives (including communities of practice and shared work space) and the e-Government Strategy had led the organisation to examine organisational knowledge and how its use and transference is supported.

This environment had in turn led the organisation to look closely at the way business functions were carried out, along with how organisational knowledge was managed. Out of this, a joint knowledge and information management plan had been formed for implementation.

4.5.4 New Chief Executive

The experience of having a new chief executive was a pivotal driver for implementing knowledge management initiatives for two organisations taking part in this research study. One organisation had a new chief executive appointed in 1998 who recognised the importance of organisational knowledge and recognised that knowledge creation and use was at the heart of the agency's role. They determined that action should be taken to support this role.

An organisational review led to the merger of IT and data management functions, along with library and records areas, into a dedicated knowledge group, led by a Chief Knowledge Officer. In parallel, staff had begun to explore knowledge management and what benefits it could bring to the organisation. External consultants were engaged to help consolidate this initial thinking, and from this mix a knowledge management strategy was developed which set the organisation's knowledge management initiative into motion.

In the other organisation taking part in this study that had a new chief executive appointed, in the first instance it was recognised and acknowledged that the agency needed to manage its information better. This led the organisation to examine electronic document management systems, but it was soon realised that looking at these in isolation from organisational knowledge and knowledge management was flawed.

In particular, the organisation has knowledge analysts whose role includes acquiring, shaping and transmitting knowledge around the organisation. In having these resources, staff view knowledge management as something meaningful and useful. The newly appointed chief executive responsible for this organisation saw the knowledge management initiative as an important project for the organisation, as knowledge generation and use is a core function for the agency.

4.5.5 Findings Regarding Knowledge Management Initiative Drivers

Questions included in the interviews around specific knowledge management initiative drivers indicated that the studied organisations had undertaken knowledge management work for change-related reasons. These were grouped around two key themes: organisational culture change and organisational knowledge, and specifically included:

- Seeking to change organisational culture.
- Recognising the importance of organisational knowledge.
- Counteracting loss of organisational knowledge through experiencing high staff turnover.
- Having a new chief executive appointed.

In regard to changing organisational culture, one of the desired results would be to ensure that organisations either have or build towards cultures that are based around trust and care. These are said to be key ingredients for organisations to maximise knowledge sharing and use (Nonaka, Toyama & Nagata, 2000 and Von Krogh, Ichijo & Nonaka, 2000).

The extent to which organisational cultures in the studied organisations support these conditions of care and trust are explored and discussed further in Section 4.6.1. However, interviewee responses around questions about knowledge management initiative drivers indicated that organisations had undertaken work in order to: change organisational cultures to ensure that learning becomes a key focus and was not lost in the organisations studied; ensure that new organisational forms and arrangements had occurred to support organisational knowledge sharing and creation; and respond to recognition of the need to improve knowledge-related processes.

The recognition of organisational knowledge's value had also been an important driver for knowledge management initiatives. In particular, interviewees spoke of the need to move away from siloed organisational cultures to those that supported knowledge sharing; examining organisational knowledge processes to find gaps in organisational knowledge; and identifying the need to capture organisational knowledge somehow to ensure that it didn't get lost or become unused.

4.6 Organisational Culture and Knowledge Management

4.6.1 The Relationship between Organisational Culture and Knowledge and Information

The review of literature in the field suggested that organisational culture has a large bearing on how organisational knowledge is created and shared. In particular, knowledge creation and sharing within organisations are said to largely depend on the conditions of trust and care existing in organisational culture (Von Krogh, Ichijo & Nonaka, 2000 and Nonaka, Toyama & Nagata, 2000).

Likewise, Damodaran & Olphert (2000) believe that the most important organisational condition for successfully implementing knowledge management is to have a knowledge-sharing culture.

Furthermore, knowledge management initiatives also need to be built on organisational cultures of trust and implemented in cultures that are said to be knowledge friendly (Damodaran & Olphert, 2000 and Davenport, de Long & Beers, 1998).

To gauge the validity of these ideas for the New Zealand State sector organisations studied, interviewees were asked if the culture of their respective organisations supported the sharing of knowledge and information.

When asked to rate the extent to which their organisational culture supports the sharing of knowledge, three interviewees (37.5%) *strongly agreed* with that their organisation provided such support, while three (37.5%) *agreed* with this statement. Two interviewees chose to represent management and staff views of this statement separately (refer to Table 4 below which demonstrates this divided view between how management and staff would rate this statement). On the whole, interviewees tended to *agree* with this statement.

Table 4 –The Extent to Which Organisational Culture Supports Knowledge Sharing

Statement Rating	Rate of Agreement
Strongly agreed	▪ 3 out of 8 organisations (37.5%)
Strongly agreed – management view	▪ ½ out of 8 organisations (6.25%)[7]
Agreed	▪ 3 out of 8 organisations (37.5%)
Agreed – management view	▪ ½ out of 8 organisations (6.25%)[7]
Agreed – staff view	▪ ½ out of 8 organisations (6.25%)[7]
Neutral – staff view	▪ ½ out of 8 organisations (6.25%)[7]

This was surprising, given that all interviewees taking part in this study *strongly agreed* that knowledge is very important for their organisations. It would appear that knowledge sharing is not as highly supported by the culture in the organisations and is seen as having lesser value than knowledge itself.

The organisations studied also had cultures that tended to support the sharing of information, as interviewees either *strongly agreed* (31.25%) or *agreed* (68.75%) with the statement that their organisation's culture supported the sharing of information (see Table 5 below which demonstrates this).

Table 5 - The Extent to Which Organisational Culture Supports Information Sharing

Statement Rating	Rate of Agreement
Strongly agreed	▪ 2 out of 8 organisations (25%)
Strongly agreed – management view	▪ ½ out of 8 organisations (6.25%)[7]
Agreed	▪ 5 out of 8 organisations (62.5%)
Agreed – staff view	▪ ½ out of 8 organisations (6.25%)[7]

[7] Recognises a split in rating by interview participant.

There was less diversity in views around organisational culture supporting the sharing of information than there was about organisational culture supporting the sharing of knowledge. This could perhaps be due to interviewees being more confident about evaluating the extent to which organisational culture supported the sharing of information.

It is suggested by McCune (1999), Scarbrough (1999), and McDermott (1999) that staff unwillingness to share their knowledge with others is a cultural barrier to implementing knowledge management initiatives. Similarly, McInerney & Le Fevre (2000) and Damodaran & Olphert (2000) assert that trust is needed for organisational knowledge sharing to occur.

To investigate whether organisations had considered these factors, interviewees were asked to rate the extent to which they considered that their organisations motivate staff to share what they know. Although there was a high level of agreement in the organisations that staff were motivated to share what they know (overall 75% of interviewees *agreed* with this statement), 18.75% of interviewees rated this as *neutral*. Results from this question are shown in Table 6 below.

Table 6 - The Extent to Which Organisations Motivate Staff to Share What They Know

Statement Rating	**Rate of Agreement**
Strongly agreed– management view	▪ ½ out of 8 organisations (6.25%)[7]
Agreed	▪ 5 out of 8 organisations (62.5%)
Agreed – management view	▪ ½ out of 8 organisations (6.25%)[7]
Agreed – staff view	▪ ½ out of 8 organisations (6.25%)[7]
Neutral	▪ 1 out of 8 organisations (12.5%)
Neutral – staff view	▪ ½ out of 8 organisations (6.25%)[7]

These results suggested that some organisations had adopted methods and practices that do motivate staff to share what they know, while others still had work to do in this area. This was borne out from comments made during interviews, where some interviewees outlined the types of practices their

organisations used to promote knowledge sharing, such as having dedicated knowledge-sharing areas within the organisation and practices which promoted informal knowledge sharing.

To test the ideas of Damodaran & Olphert (2000) and Davenport, de Long & Beers (1998), interviewees were asked to comment whether the culture of their organisation could be described as knowledge friendly. For the purposes of this study, a knowledge-friendly organisational culture was defined as an organisational culture with the characteristic of staff willingly swapping and sharing their knowledge and information with one another.

After the term knowledge friendly was explained and its definition explored during interviews, six interviewees *agreed* that their organisation's culture could be viewed as knowledge friendly, as shown in Table 7. One interviewee *strongly agreed* with this idea, while the other chose to split their response between what the management view in their organisation would be, as opposed to what the staff view would be.

Table 7 -The Extent to Which Organisational Culture Could be Viewed as Knowledge Friendly

Statement Rating	**Rate of Agreement**
Strongly agreed	▪ 1 out of 8 organisations (12.5%)
Strongly agreed – management view	▪ ½ out of 8 organisations (6.25%)[7]
Agreed	▪ 6 out of 8 organisations (75%)
Agreed – staff view	▪ ½ out of 8 organisations (6.25%)[7]

It would appear from these results that the organisations taking part in this study had knowledge-friendly organisational cultures. Five organisations (62.5%) had implemented some form of knowledge management initiative, which may have directly impacted and caused this cultural condition.

4.6.2 Cultural Barriers and IT System Changes

In the view of McDermott (1999), the largest barrier to success for knowledge management initiatives lies in changing organisational culture and work habits to support the initiative. Given that not all organisations had implemented knowledge management initiatives, interviewees were asked to comment if there had been any

cultural barriers to implementing any IT system changes made in order to give a general indication of likely impacts associated with introducing knowledge management initiatives.

In response, six out the eight interviewees (75%) commented that yes, there had been cultural barriers experienced, while two (25% of the interviewees) said no there hadn't been.

Interviewees who said yes to this question were then asked to describe cultural barriers that had arisen in their organisation when implementing system changes. General cultural barriers experienced have varied significantly and have included:

- Staff being resistant to change in general.
- Having a culture of staff wanting to take a different approach to organisational tasks and not adopting common templates, practices or processes.
- Introducing new systems such as document management systems, then discovering that half of the organisation uses these, but the other half ignores them.
- General lack of uptake of new systems introduced and implemented.
- Resistance by staff to using new IT systems and processes.

More detailed questioning of interviewees revealed that cultural barriers experienced in the organisations that have implemented knowledge management initiatives have included:

- Lack of knowledge sharing and lack of trust.
- Having an organisational culture dominated by silos, where staff don't readily contribute knowledge to organisational knowledge bases.
- Staff not seeing the value in contributing to organisational knowledge bases.
- Staff not being willing to share what they know.

Interviewees from organisations studied which had implemented knowledge management initiatives also gave the following accounts of how cultural barriers had been overcome, when their organisations had implemented knowledge management initiatives:

- Focusing the knowledge management programme around the primary driver of changing organisational behaviour. This had been supported with thinking about the sort of systems needed to support these desired organisational behavioural changes. This was a deliberate move, as the organisation was determined not to go down the track of designing a knowledge management initiative, implementing it, having everyone use new knowledge management tools, and then not achieving organisational culture change.

- In one organisation studied staff had been sceptical about the initial installation of knowledge management tools including a knowledge base, saying that these could never compensate for staff knowledge. However, this view had changed over time with most staff in the organisation using the knowledge base. This had been accompanied by a change in staff opinion as staff could see the benefits of using it.

- Two knowledge management initiatives had included complementary communication and change management work streams to support the cultural change needed in the organisations in which they were implemented. This work had been designed to be integrated within the overall knowledge management initiative, to support change management approaches.

Interviewees were then asked to comment about whether their organisations had needed to make any cultural changes or adjustments when introducing IT system changes. Six interviewees (75%) replied yes, that their organisations had needed to make such changes, while two (25%) interviewees said that their organisations hadn't, which represented similar results to the earlier question posed about cultural barriers experienced.

The results from questions posed around cultural barriers tend to agree with McDermott's (1999) assertion that the difficulty with most knowledge management effort lies in changing organisational behaviour. For the organisations studied, this has proved to be an issue and a number of activities have been undertaken to counteract cultural barriers experienced.

4.6.3 Support by Chief Executive of the Knowledge Management Initiative

The review of literature in the field revealed that having leadership is an important factor in knowledge creation and transfer (Nonaka & Takeuchi, 1995) and that successful implementation of knowledge management initiatives requires leadership at chief executive level (Damodaran & Olphert, 2000 and the OECD, 2001), and

buy-in from management (Malhotra, 2000).

Leadership support of knowledge management work is considered necessary as leadership is needed to provide direction, to ensure that the organisation has the support infrastructure required and to lead or promote organisational cultures that support knowledge-related processes such as knowledge creation and use. To test these views, interviewees were initially asked about chief executive support for knowledge management initiatives.

In response, all eight interviewees considered that their organisation's chief executive supported the knowledge management initiative undertaken in their organisation. Seven (87.5%) of the interviewees *strongly agreed* with the statement that their chief executive supported their knowledge management initiative, while one (12.5%) *agreed* that their knowledge management initiative had the chief executive's support.

Furthermore, three interviewees (37.5%) commented that they would rank the support received by their leadership team for their organisation's knowledge management initiative at an equal level. These interviewees also suggested that obtaining senior management support for knowledge management initiatives was equally as important as having the chief executive's support in terms of how successful the knowledge management initiative had been.

In terms of the impact that this support from chief executives has had on the knowledge management initiatives undertaken, four (50%) of the interviewees *strongly agreed* with the statement that this had impacted on results achieved, while three (37.5%) *agreed* with this statement. One interviewee was neutral about the statement, as their organisation had implemented a knowledge management initiative some time before their current chief executive was appointed, but their knowledge management initiative had been heavily supported by their previous chief executive.

It was interesting to note that four organisations (50%) taking part in the study had gained new chief executives in the recent past, and that this situation often had been the catalyst for knowledge management work being undertaken or its use heavily promoted in the organisations included in this research study.

Thus, the ideas of Damodaran & Olphert (2000), the OECD (2001) and Malhotra (2000) about the importance of chief executive ownership of knowledge management initiatives and senior management buy-in of knowledge management work are supported by these findings.

4.6.4 Findings Regarding Organisational Culture Issues

It proved useful to look at whether organisational culture in the organisations studied supported the sharing of knowledge and information. The results from the interviews conducted showed that the extent to which organisational culture supports the sharing of knowledge varied. It would appear that knowledge sharing is not as well supported in the organisations studied as it ought to be (given the importance that organisations are said to place on the value of knowledge).

Another area explored with interviewees was the extent to which organisations motivate staff to share what they know. Interviewees on balance *agreed* with the statement: "the culture of my organisation motivates staff to share what they know", although there was a diverse range of responses given against this statement.

Most interviewees *agreed* that the culture within their organisations could be described as knowledge friendly. The literature review findings pointed to a number of commentators (Damodaran & Olphert, 2000 and Davenport, de Long & Beers, 1998) who consider that this is an important condition for knowledge management initiatives to succeed.

It would appear from these results that the organisations taking part in this study have cultures that go some way to supporting the sharing of knowledge and information, but that they probably need to focus more attention into this area. Given that some of the organisations involved had implemented knowledge management to address organisational culture changes around dissipating silos of knowledge, this finding was not surprising in that it takes significant time to change organisational culture.

Another aspect of organisational culture explored to gauge the success of knowledge management initiatives was the relationship between organisational culture and IT system changes. A large percentage (75%) of the interviewees said that their organisation had needed to make cultural changes to support IT system changes made and had experienced a high level of cultural barriers when implementing system changes.

In order to support cultural changes needed, two organisations that had implemented knowledge management initiatives chose to implement communication and change management work-streams in parallel with the knowledge management programme itself. These measures were taken to ensure that behavioural and cultural changes required to support knowledge management

work would be bedded in for the long term.

One of the key findings from the literature review was that knowledge management initiatives cannot succeed without chief executive support (Damodaran & Olphert, 2000, the OECD, 2000 and Malhotra, 2000). All of the organisations that took part in this study *strongly agreed* that their knowledge management initiative had the support of their chief executive, and that this had made a positive impact on the results achieved.

Some commented that the support of the leadership team for knowledge management initiatives was equally as important as the chief executive's support for the success of the overall programme. Interviewees saw chief executive support and championship of the knowledge management initiative as a key to success.

4.7 Stages and Timeframes of Knowledge Management Initiatives

4.7.1 Stages of Knowledge Management Initiatives

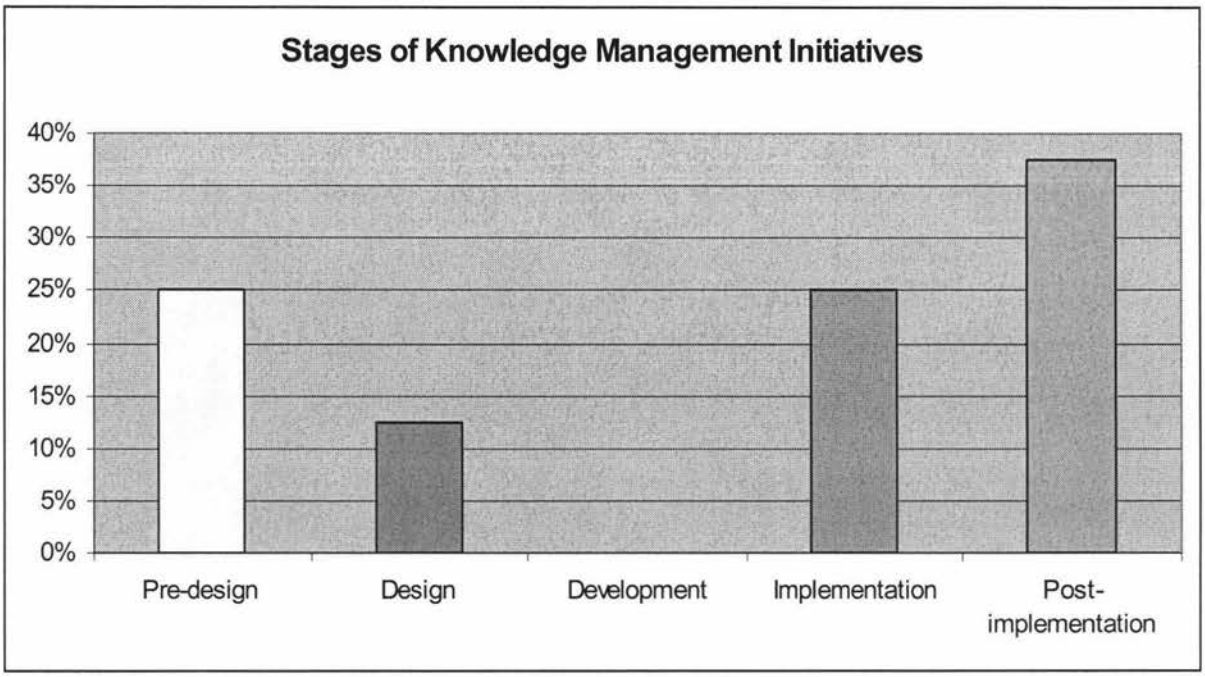
The OECD (2001) suggested that the use of knowledge management internationally in the State sector is at risk of falling behind the practices of leading edge private sector companies. Accordingly, the organisations studied were asked how far advanced their individual knowledge management initiatives were. Responses to this question revealed that, in general, there are five lifecycle stages for knowledge management initiatives:

- pre-design (information gathering and analysis)
- design
- development
- implementation
- post-implementation.

Organisations taking part in this study were spread across the following lifecycle stages for knowledge management initiatives (as shown in Figure 9 below):

- Two organisations (25%) were at the pre-design stage.
- One organisation (12.5%) was at the design stage.
- Two organisations (25%) were at the implementation stage.
- Three organisations (37.5%) were at the post-implementation stage.

Figure 9 – Stages of Knowledge Management Initiatives



Those organisations which were at the pre-design and design stages were starting from the point of developing knowledge management strategies. By contrast, some organisations at the implementation stage had built their knowledge management initiatives upon strong information management platforms and philosophies (that is, migrating ideas from the existing information practices and processes to a large extent) or had developed their knowledge management initiatives as new projects.

Organisations at the post-implementation phase had found that their knowledge management initiatives had largely been successful, but hadn't gone as far as originally intended in facilitating or capturing organisational learning. These agencies were considering ways of leveraging this for the future. New knowledge management work for these organisations was aimed at exploring this aspect further, along with advocating greater use of communities of practice.

4.7.2 Timeframes of Knowledge Management Initiatives

Timeframes associated with knowledge management initiatives for the organisations are intrinsically linked with lifecycle stages for the overall knowledge management work. Organisations in the post-implementation stage began their knowledge management work in 1997, 1999 and 2000 (giving a timeframe of six, five and four years respectively). Organisations in the implementation stage began

their knowledge management work in 2002 (two-year timeframe) and organisations in pre-design have by and large begun to consider using knowledge management in the past year.

Processes and timeframes followed by organisations with developed knowledge management initiatives have varied, but tend to follow the following sequence:

- project scoping/planning
- design
- develop and build
- implementation/roll-out production
- "bedding in".

For most organisations that had implemented knowledge management initiatives, it had taken around two years to move from project scoping/planning to reaching the implementation/roll-out production stage. Many organisations had found that implementation of knowledge management initiatives takes 12–18 months, before the "bedding in" stage is reached.

4.7.3 Findings Regarding Knowledge Management Initiative Stages and Timeframes

In order to gauge how far advanced knowledge management use is in New Zealand State sector organisations, interviewees were asked about the lifecycle stage of their knowledge management initiative. Three organisations taking part in this study were at the beginning of the lifecycle, being at pre-design and design stage respectively, two were at the implementation stage and three were at the post-implementation stage.

The timeframe for knowledge management initiatives used in the organisations studied were four to six years for early adopters who began knowledge management work between 1997–2000, and two years for organisations who have recently implemented knowledge management initiatives, who began design work in 2002.This means that five organisations (62.5%) were well down the track of using knowledge management, having implemented knowledge management initiatives for some time or in the recent past.

This finding was not anticipated, as anecdotal advice had suggested that there were

few organisations in New Zealand that had implemented knowledge management initiatives, and it was assumed that few State sector organisations would have started using knowledge management. It is likely that some of the organisations studied would have been pioneers of knowledge management initiatives in New Zealand.

4.8 Storing and Using Knowledge and Information

4.8.1 Knowledge Storage and Use

The most common knowledge stores used by the organisations taking part in this research study consist of a combination of paper- and electronic-based storage, while the least common knowledge stores were paper based. The overall ranked results for knowledge storage use are shown in Table 8 below.

Table 8 – Knowledge Stores Commonly Used in State Sector Organisations Studied

Knowledge Store Types	Rate of Use in Organisations Studied
Combination paper-electronic based	▪ 7 out of 8 organisations (87.5%)
Library or corporate knowledge store	▪ 6 out of 8 organisations (75%)
Decentralised records	▪ 3 out of 8 organisations (37.5%)
Centralised records	▪ 2 out of 8 organisations (25%)
Electronically based	▪ 1 out of 8 organisations (12.5%)
Paper based	▪ No organisations (0%)

In regard to other forms of knowledge stores used, three interviewees (37.5%) commented that knowledge within their organisation was stored in people's heads, and remarked that this was not included as a listed option on the interview guide/questionnaire. Interviewees also commented that knowledge is captured and stored within organisational processes, routines and stories.

When asked about knowing what use was made of knowledge captured in the different types of knowledge stores listed, most interviewees commented that knowledge was used a lot. However, this tended to be anecdotal advice as closer questioning about how knowledge captured is used revealed that few organisations studied had formal systems or mechanisms to check or confirm that this was the case. Only one organisation studied monitored the amount of use tools like knowledge bases got.

Interviewees were then asked if their organisation knew what knowledge is critical to organisational success. Responses ranged from no from one organisation, to yes

from three organisations who were either aware of or could identify what knowledge was critical to the organisation. Four interviewees (50% of respondents) considered that their organisation had gone some way to identify or have a reasonable idea about what knowledge is critical to their success, but that this was not a particular competency for their organisations.

Some interviewees answered this question about the criticality of knowledge by saying that they knew what *information* is critical to the organisation as this was a legislative requirement. This touched on the fact that interviewees either didn't see the distinction between knowledge and information, or that their organisation had similar processes around the way both knowledge and information are captured and used.

Interviewees were also asked to comment on how their organisation ensures that the knowledge captured in knowledge stores or systems is what the organisation needs. Responses received revealed that a range of methods is used, as illustrated in the following examples:

- Some interviewees had found they needed to change the knowledge that has been captured within organisational knowledge systems and tools, either because they needed to continually repeat knowledge activities or because they were asked for the same articles of knowledge a lot.

- One interviewee spoken to said that their organisation promoted the capture of knowledge in the most effective and efficient ways, and was trying to capture what knowledge was critical to key work processes rather than all knowledge available in the organisation.

- Another organisation promotes good practice work examples and the recording of knowledge that is needed by staff. It also supports performance appraisals and assessments on knowledge management competencies, such as about how good staff members are at capturing organisational knowledge.

Out of this response, it was evident some organisations studied recognised the importance of the idea of capturing organisational knowledge that staff members need to know and are working on how to capture it.

4.8.2 Information Storage and Use

In terms of the way that organisations store information, the two most common storage methods used were a combination of paper and electronic bases, and

libraries or corporate information stores (seven out of the organisations or 87.5% use these), whereas the least common storage method is paper based only. Information storage types used in organisations studied are shown in Table 9 below.

Table 9 - Information Stores Commonly Used in State Sector Organisations Studied

Information Store Types	Rate of Use in Organisations Studied
Combination paper and electronic based	▪ 7 out of 8 organisations (87.5%)
Library or corporate information store	▪ 7 out of 8 organisations (87.5%)
Decentralised records	▪ 4 out of 8 organisations (50%)
Centralised records	▪ 3 out of 8 organisations (37.5%)
Electronically based	▪ 1 out of 8 organisations (12.5%)
Paper based	▪ No organisations (0%)

Organisations taking part in this study were asked if information stored in information stores is used very much, and all participants responded that yes information in formal bases is used a lot.

One interviewee considered that, while information captured in their organisation is used a lot, it is often not readily retrievable and that this is a significant issue for their organisation. This lack of accessibility meant that staff tend to store their own information, if they determine that they can't easily get access to other sources, which in turn creates another storage and retrievability issue.

At this point during the interviews conducted, interviewees indicated that it can be difficult to distinguish information from knowledge when asked questions about the ways both information and knowledge are stored and used in their organisations. This was one of the reasons for asking distinct questions about the way that knowledge and information are stored and used in organisations.

In terms of knowing what information is critical to the success of the organisation, seven (87.5%) interviewees commented that their organisation did know what information is critical. One interviewee (12.5%) responded that their organisation

had a good idea about what information was important but needed a better, more shared approach on distinguishing this from other categories of information.

One interviewee commented that their organisation had a better idea about what information is critical to their success than what knowledge is critical. Most interviewees alluded to the fact that legislative obligations drove knowing what information is critical to their organisation's success.

When asked about how their organisation ensures that the information that gets captured is what the organisation needs, five interviewees (62.5%) answered this by referring to their earlier responses about methods for ensuring that the organisation captures the *knowledge* that it needs. This suggested that knowledge stores and information stores tend to be indistinguishable and that interviewees saw these as largely being the same. That is, interviewees had difficulty distinguishing in a practical sense between knowledge and information stored by their organisations.

4.8.3 Findings Regarding Storage and Use of Knowledge and Information

The most commonly used types of knowledge and information stores utilised in the organisations studied are a combination of paper/electronic-based stores and library/corporate knowledge stores. Anecdotal advice was that these knowledge and information stores gain high use. However, interviewees taking part in this study couldn't easily identify what knowledge and information captured within different store types is considered to be critical to their organisations' success. It was also revealed that information access and retrievability are critical issues for some organisations.

Knowing what information is critical to the business tends to be driven by legislative obligations or stipulated in legislation for most of the organisations. In addition, interviewees were asked to comment on how they ensure that knowledge captured in knowledge stores is what the organisation needs. Most said that their organisation did not have formal systems to monitor this but used pragmatic approaches to ensure that the organisation captures critical organisational knowledge.

Interviewees often referred back to earlier responses about *knowledge* when asked questions about ensuring that the organisational information that gets captured is what the organisation needs. They tended to look at these concepts as inter-

changeable ideas. This suggested that they couldn't easily identify the difference between what is stored as an item of knowledge and what is stored as an item of information.

These findings tally with McCune's (1999) contention that organisations are inclined to capture data, information and knowledge which doesn't get used or is not required, due to lack of focus on what is really needed by staff to carry out their jobs. It could be seen that this is also complicated by organisations not being able to easily distinguish between items of knowledge and items of information.

4.9 Knowledge Management Systems

4.9.1 Types of Knowledge Management Systems Commonly Used

The most commonly used knowledge management systems in the organisations taking part on this study were intranets and the Internet. All eight of the organisations studied (or 100%) use these. The least common form of knowledge management systems were kiosks and Executive Information Systems (only one organisation or 12.5% used each of these). Table 10 below shows all of the knowledge management systems used in the organisations taking part in this research study.

Table 10 - Knowledge Management Systems Commonly Used in State Sector Organisations

Knowledge Management System	Rate of Use in Organisations Studied
Intranets	▪ 8 out of 8 organisations (100%)
Internet	▪ 8 out of 8 organisations (100%)
Electronic yellow pages	▪ 6 out of 8 organisations (75%)
Knowledge repositories	▪ 5 out of 8 organisations (62.5%)
Management Information Systems	▪ 5 out of 8 organisations (62.5%)
Extranets	▪ 4 out of 8 organisations (50%)
Other knowledge management systems	▪ 4 out of 8 organisations (50%)
Data warehouses	▪ 4 out of 8 organisations (50%)
Portals	▪ 4 out of 8 organisations (50%)
Decision support systems	▪ 3 out of 8 organisations (37.5%)
Knowledge maps	▪ 3 out of 8 organisations (37.5%)
Knowledge webs	▪ 2 out of 8 organisations (25%)
Kiosks	▪ 1 out of 8 organisations (12.5%)
Portals	▪ 1 out of 8 organisations (12.5%)

Given the e-Government requirements regarding provision of access to government services by electronic means where possible, it was not surprising to have this rate of adoption of the Internet and intranets in the organisations studied. However, it was not anticipated that the number of organisations using extranets to connect themselves to partnering agencies would be as high as the results shown in Table 10 showed.

One of the core components of knowledge management systems described by interviewees was an electronic document management system that has been integrated with organisational knowledge bases and workflow systems. Although some organisations had chosen to integrate their knowledge bases directly with workflow systems, they tended not to link these with data warehouses.

Organisations that hadn't implemented knowledge management initiatives were looking specifically at integrating workflow systems, electronic document management systems, records management systems and call centre systems into their overall knowledge management initiative.

4.9.2 Use and Maintenance of Knowledge Management Systems

Leidner (1999) points to the fact that system users must actively contribute their organisational knowledge to knowledge management systems to trap tacit knowledge. In the organisations studied that have implemented knowledge management initiatives, knowledge creators or knowledge users or specified business groups are responsible for contributing and maintaining their knowledge in knowledge management systems.

Some organisations had also engaged technical staff to provide support on maintaining knowledge captured in knowledge management systems. But in contrast, interviewees from other organisations tended to consider that having support people second guess what was important organisational knowledge, and therefore needed in terms of knowledge maintenance, was not appropriate.

Organisations studied that had implemented knowledge management systems had used a variety of methods to keep organisational knowledge in knowledge management systems current. These included:

- Seeking early advice about changes to key aspects of knowledge such as policy changes and legislation changes.
- Having a document refresher date or expiry date for documents lodged in

knowledge bases.

- Using automatic bring-up systems and automatic flags.
- Documenting key processes and everything needed to know about working in a given process (including the subject matter experts to tap into and lessons learned from the past), along with frequently asked questions.
- Soliciting feedback from users.

However, keeping knowledge current is a problem for some of the organisations studied. Two interviewees commented that they wished their organisation had processes that kept knowledge captured in knowledge management systems more up to date. This was due to it being difficult to readily identify current knowledge and other knowledge that needs to be updated.

Organisations taking part in this study that had implemented knowledge management systems were asked about whether they measure the amount of use that their knowledge management systems currently get. Responses given were either yes or no. For yes answers, interviewees made comments such as "we have an automated system that measures the amount of use the knowledge management system gets, but we do little with the results". Whereas for no answers, comments such as "the extent of use our knowledge management system gets is not measured yet" were made.

Early adopters of knowledge management systems tended to have rudimentary measurement systems in place that counted the number of hits within knowledge bases, or electronic document management systems that track how often documents are accessed and who has accessed them. But in general, knowledge use was not well monitored in the organisations studied.

4.9.3 Findings Regarding Knowledge Management Systems

The most commonly used knowledge management systems in organisations that took part in this study were intranets and the Internet, which is not surprising given e-Government requirements on State sector organisations to provide services electronically (State Services Commission, 2003).

Integration between knowledge management systems and main workflow systems is varied for the organisations studied. Some knowledge management systems are more integrated with main operating systems than others.

Knowledge management systems tend to link together electronic document management systems, knowledge bases and some workflow system components. More sophisticated knowledge management systems also included libraries and knowledge repositories.

On the whole, measurement tools that gauge the amount of use knowledge management systems receive tend to be limited to those systems that count the amount of hits received and little else. This is a significant finding, in that organisations that have implemented knowledge management systems have invested in their knowledge management initiatives and should be able to check that their knowledge management systems are in fact being used. It would no doubt be disappointing for them to go down the track of implementing knowledge management tools only to find that limited use is being made of these.

For most knowledge management initiatives implemented, knowledge creators and knowledge users are responsible for maintaining knowledge captured within knowledge management systems, which means that Leidner's (1999) concerns about system users not actively contributing to organisational knowledge systems don't apply.

Organisations taking part in this study tend to use a variety of methods to keep organisational knowledge up to date. These methods include soliciting feedback from users, using automatic bring-up systems and documenting processes, and keeping this advice up to date. Some organisations wish to do more in this area in the future. Measuring the amount of use knowledge management systems get tends to be rudimentary and not far advanced in most organisations studied.

4.10 Designing and Implementing Knowledge Management Systems

4.10.1 Who Got Involved?

One of the contentions raised by Pfeffer & Sutton (1999) is that knowledge management work often gets divorced from day-to-day business activities, as those people designing and building knowledge management systems often have a limited or inaccurate view on how knowledge gets used in organisations. To test out the applicability of this for the organisations studied, interviewees were asked about who got involved with designing and implementing knowledge management systems in their organisations.

It was found that all five organisations studied with knowledge management initiatives in place had large staff involvement in designing knowledge management systems. Two of these organisations chose to have internal teams of staff initially design their systems. They then consulted within the organisation about what had been designed and what else was required. These design groups were then supported by external service providers who gave technology or system solution advice and support on project implementation.

Two other organisations had a much wider internal involvement by canvassing organisational-wide opinion and seeking everyone's input first about the knowledge management initiative. This resulted in most people in the organisation being involved with the design of the knowledge management initiative and system (it should be noted that these organisations were substantially smaller than those referred to in the paragraph above). One organisation limited external involvement in their knowledge management initiative to seeking external ideas to springboard the overall project, and developed their knowledge management system in-house. The other organisation chose to use an external technical solution provider for implementing their knowledge management system, once an internal group had designed it.

The remaining organisation had a more formalised approach by having an internal steering group, which was led by the chief executive, an internal project group, an independent advisor and an external development partner who was involved in both design and technology solutions. This organisation chose to have the largest amount of external help out of all five organisations.

4.10.2 Were Consultants Used?

In regard to the use of consultants, the five organisations taking part in this research study that have implemented knowledge management initiatives had all used consultants or external help to assist with their knowledge management work. Most had used consultants and outside expertise to particularly assist with designing and building systems (such as knowledge bases). However, two organisations have used consultants to provide spring board ideas at the pre-design stage, but chose to develop their own technology solutions or buy off-the-shelf knowledge management products.

Two organisations have also chosen to use consultants to help provide extra resources and to assist with the knowledge management initiative from initial design to implementation stages. These organisations have also considered that consultants can add value to their overall knowledge management initiatives.

One interviewee, whose organisation is at the pre-design stage, commented that they would engage consultants for their knowledge management initiative as they saw advantages in having outside expertise assist with their knowledge management programme.

4.10.3 What Types of Systems were Designed/Purchased?

Organisations taking part in this study were asked about what type of knowledge management systems had been designed or purchased as part of their knowledge management initiative. From the five organisations that have implemented a knowledge management initiative, two of the organisations have purchased off-the-shelf systems to support their knowledge management initiative.

These two organisations had purchased off-the-shelf document management systems that were integral parts of the knowledge management initiative. Both interviewees representing these organisations commented that their organisations tended to buy off-the-shelf technology solutions that needed little customisation.

In contrast, the other three organisations had opted to purchase IT solutions that they could customise to fit their knowledge management initiatives. These organisations tended to opt for customised approaches for all IT solutions that could be adapted to best fit their environment and deliver on specific knowledge management needs.

4.10.4 How has Implementation Occurred?

A variety of implementation methods and processes have been used by organisations that have implemented knowledge management initiatives. These approaches are summarised below.

One organisation started by identifying all of the common questions asked by clients, then designing and building a knowledge base around this. The knowledge base was tested progressively as it was developed then rolled out as a pilot to limited areas before being implemented across the whole organisation. Accompanying this development work were change management and communications work streams that were designed to address the impact of changes associated with implementing the knowledge management initiative.

Another organisation chose to centre its knowledge management initiative on cultural and behavioural changes. Ideas about knowledge management were developed and tested with members of the organisation over time, and then outside help was sought to spring board the knowledge management initiative. Out of this work, an implementation plan was developed for a knowledge management programme of activities, which was then put into place.

Analysing business processes led one organisation to consider what it "did well" and what it "knew well" on an organisational-wide basis. This then pinpointed gaps in business processes and activities. In addition, business goals were compared against "know well" and "do well" activities identified to diagnose gaps. This gap analysis led to developing knowledge-driven questions that were tested out across the organisation, and then designing a knowledge management solution with three streams: people; processes; and technology.

The remaining two organisations have started their knowledge management initiatives by widely consulting with all staff across the business as to what knowledge management needs are, then forming a knowledge management strategy and designing a knowledge management project out of this.

4.10.5 Findings About Designing and Implementing Knowledge Management Systems

In terms of designing and implementing different approaches to knowledge management initiatives, one of the central things in common for the organisations taking part in this study was the extent of internal involvement in knowledge management initiative and system design. In particular, all of the organisations spoken to that have implemented knowledge management initiatives had internally developed their knowledge management systems and initiatives.

Again, all five of the organisations that had implemented knowledge management initiatives had used external help to assist with their knowledge management project. Sometimes this had been limited to providing advice at the design stage, while some organisations had chosen to have external assistance for all stages of the knowledge management initiatives implemented.

In regard to the types of knowledge management systems designed or purchased by the organisations studied, there were two distinct themes: make or buy. Two interviewees explained that their organisations had bought off-the-shelf knowledge management systems that need little customisation, while the other three organisations had opted to purchase customised IT solutions to fit their knowledge management needs. Choice of off-the-shelf or customised systems tended to be dictated by organisational IT practices (make or buy).

Implementation of knowledge management initiatives had occurred using a variety of methods. Some organisations chose to develop knowledge management strategies first then, after consulting with staff, built knowledge management programmes around this. Others went for an initial design focused around the most frequently asked questions in an organisation, which became the genesis for a piloted knowledge base.

Some organisations centred their knowledge management initiatives and implementation programmes on culture changes and behaviour changes needed within the organisation. Ideas about knowledge management were developed and tested for some time, then a strategy and plan was developed for a programme of knowledge management activities based on changing organisational culture and behaviours. Another implementation method was driven by examining processes for knowledge gaps and designing a knowledge management solution to fill these.

4.11 Lessons Learned by Organisations

4.11.1 Positive Outcomes from the Knowledge Management Initiative

In terms of the positive outcomes that organisations taking part in this research had found from implementing knowledge management initiatives, the following three key outcomes are prevalent: gaining organisational recognition about the importance of organisational knowledge; achieving greater organisational knowledge sharing; and gaining easy access to knowledge and information within the organisation. Each of these in discussed in more detail as follows.

One of the key positive outcomes from implementing knowledge management initiatives in some of the organisations studied has been the recognition of organisational knowledge's importance to the organisation. Interviewees had found that their knowledge management initiatives had generally increased awareness and understanding about the role that organisational knowledge plays in their organisations.

Along with this recognition of organisational knowledge's importance in organisations studied, there has been an acceptance by staff to think more about their own knowledge and information, and the way it is used, which has had positive effects.

This greater emphasis on knowledge had caused improvements in the way that tacit and explicit knowledge are shared in organisations taking part in this study. One interviewee spoke about the now obvious change in people's willingness to talk and share knowledge through forums and seminars. Other interviewees talked about the positive benefits realised of having people take time to get together to share knowledge more often that had occurred prior to having a knowledge management initiative.

Another key outcome has been the accessibility to knowledge and information in general. Interviewees spoke of the positive benefits of having easy access to finding staff expertise, to knowledge and information, and having this kept up to date for staff to use.

Other positive outcomes from having knowledge management initiatives have been:

- Getting consistent knowledge and information across organisations, no matter where people are located or what level of expertise they have.
- Having a dedicated organisational knowledge store that may be extended to other areas.
- Implementing cultural changes in organisations to stem high staff turnover rates, which over time led to people wanting to stay in the organisation.
- Exposing knowledge and information hoarders and those who wouldn't share these within organisations.
- Getting other significant projects approved on the basis of being able to leverage off the implemented knowledge management initiatives.

4.11.2 Negative Outcomes from the Knowledge Management Initiative

There was a wide-ranging response to asking interviewees taking part in this study about any negative outcomes that have arisen in their organisations from undertaking knowledge management initiatives. These responses are set out below as follows:

- Dealing with the perceived "dumbing down" of staff who provide advice based on what is recorded within knowledge bases. Staff do not have to necessarily know this knowledge themselves now.
- Revisiting the process undertaken in implementing knowledge management initiatives – looking at how it was conducted and knowing it could have been improved.
- Taking too long to implement changes and generally not thinking enough about implementing changes in an easier manner.
- Having to closely manage change fatigue to ensure that the speed of organisational change caused by knowledge management initiatives is not overwhelming.
- Realising the large magnitude of the knowledge management initiative and being overwhelmed about the extent of change needed to achieve it.
- Dealing with people in the organisation who think that getting a knowledge management system will be the panacea to all issues, with the "if we just get a

new system or tool, we'll be okay" mindset.

Overall there were more positive than negative outcomes for the organisations that had implemented knowledge management initiatives.

All of the interviewees considered that the knowledge management initiative undertaken in their respective organisations was valued by the organisation. In particular, the majority of interviewees (81.3%) *agreed* with the statement that their organisation values the knowledge management initiative it has undertaken, while the remainder (18.7%) *strongly agreed* that their organisation valued its knowledge management initiative.

4.11.3 What Organisations would do Differently if Starting Again

Interviewees were asked to comment about what, if anything, they would do differently if they were to carry out the same knowledge management exercise again. One interviewee considered it important to define what knowledge management is for an individual organisation, as people have difficulty grappling with the concepts around it thinking that knowledge management is either about tools or about people. Having a shared and common understanding of knowledge management was seen as key for some organisations studied.

Other interviewees spoke about the time taken for developing and implementing knowledge management initiatives as being too long. In this situation, one interviewee said that they would have used a shorter process to get up and running and to find out what user requirements were. Another interviewee said that they wouldn't have spent as much time in the intermediary development stages if they had the chance to start again.

Another interviewee had found some minor things around particular knowledge management projects could be better managed a second time around. These included issues like the way components of the knowledge management initiative were rolled out or designed, particularly to fit limited time opportunities. This had led to implementation not being as smooth as it could have been.

Some organisations found that they had been a little over ambitious about what could be achieved in the timeframe set for their knowledge management initiatives. They found that there is a limit to the number of things that staff can handle at one time, particularly if they need to be productive at their jobs. These organisations had found change exhaustion had set in at different points in time in the process

undertaken. Trying to achieve positive organisational change at speed was considered an issue for most organisations studied.

Another interviewee commented that, if they had the ability to start again on their knowledge management initiative, they would have put more effort and emphasis into IT solutions development in order to have a more solid approach.

4.11.4 Findings Regarding Lessons Learned by Organisations

Lessons learned by organisations that have implemented knowledge management initiatives have both positive and negative aspects. On the positive side, organisations found that there was a much greater recognition of the importance of organisational knowledge within their organisations, that enhanced organisational knowledge sharing had occurred, and that it was a lot easier to access knowledge and information across the whole organisation.

Other positive outcomes had been being able to get consistent knowledge and information across the whole organisation, implementing cultural changes to stem high staff turnover rates and having dedicated knowledge resources such as knowledge bases.

Negative outcomes that have occurred as a result of undertaking knowledge management initiatives were recognising that the process undertaken was not as smooth as possible, taking too long to implement system changes, having to closely manage change fatigue, and realising the magnitude of organisational change needed to implement the knowledge management initiative.

All interviewees considered that knowledge management initiatives undertaken to date are valued by the organisations that have implemented them.

If undertaking the same exercise again, interviewees tended to answer that they wouldn't have taken the same amount of time developing knowledge management initiatives.

In contrast, one interviewee said that they would have implemented things differently and taken more time to roll out components of their organisation's knowledge management initiative. Other interviewees who had found that their knowledge management programmes were a little over ambitious in terms of timeframes and what could be reasonably achieved shared this view.

SECTION 5 – DISCUSSION

5.1 Introduction

The key goal and objective of this thesis is to examine the role that knowledge management plays in New Zealand State sector organisations, to ascertain if they could potentially gain advantages from adopting knowledge management. A secondary goal was to discover how New Zealand State sector organisations benefit from using knowledge management.

To reach the stated goals and objectives of this thesis, the following framework was adopted to guide supporting research:

- Considering how knowledge is created and used in organisations.
- Investigating different approaches to developing and implementing knowledge management.
- Investigating the use of knowledge management in a range of New Zealand State sector organisations.
- Determining if New Zealand State sector organisations can learn from the implementation of knowledge management initiatives that have already been undertaken in the State sector.

In order to explore the goals and objectives of this thesis, an examination of literature in the field was carried out to determine what is known about knowledge management in general and to find out about existing research in the field. This led to consideration of the possible gaps in knowledge and further research that could be carried out to address these.

A series of research questions were devised from the literature review, which largely shaped the research conducted in the field. These were grouped around the research framework adopted.

The research questions formed are discussed in detail in the following section, along with the results from field research against each of these. Comparisons and contrasts are also drawn between what was expected in terms of what the literature review signalled about knowledge management and the actual results found for knowledge management initiatives implemented in the organisations studied.

One of the critical things that became apparent in considering the literature about knowledge management and from the field research results was the issue of uncertainty around defining data, information and knowledge, along with knowledge management, in that no one agreed definition of each term exists. Working definitions of these terms were then developed to give the specific meanings of these to be used in this research study.

Following on from the review of literature in the field, the experiences from eight New Zealand State sector organisations that have either began considering or have implemented knowledge management initiatives were explored through in-depth interviews. In particular, the research conducted in the field was aimed at finding out how knowledge management initiatives had been designed and implemented, and to gain insight into what they had learned from their collective experiences.

5.2 Definitional Issues

5.2.1 Data, Information and Knowledge

Before considering how knowledge is created and used in organisations, it was necessary to look at defining what knowledge is and what the term represents. This uncovered a problem: there is no one agreed definition or common understanding about what knowledge is. Instead, academics and researchers have used working definitions to illustrate what knowledge means to them. Thus, it became necessary to construct a working definition of knowledge for the purposes of this research study. The working definition initially used for knowledge was:

> "Knowledge is information that has been fused and blended with understanding, awareness, context, purpose and expertise that enables someone to take action."

The review of literature in the field undertaken highlighted that one of the important aspects of knowledge is its ability to allow someone to take action, based on their acceptance and belief of experience (which can be their own or someone else's). The ideas of Davenport, De Long & Beers (1998) and Davenport & Prusak (1998) acknowledge and support this view.

During the field research phase of this research study, a number of the interviewees from the organisations studied remarked that one important characteristic of knowledge is that it enables someone to take action based on experience. This characteristic includes believing and accepting someone else's experiences, as well as an individual's own, and taking action in cognisance of this. The acceptance and use of experience is considered to be an important ingredient in the overall package of what makes up knowledge.

The original working definition of knowledge constructed for this research study did not refer to this acceptance and use of experience, and so it was revised to become:

> "Knowledge is information that has been fused and blended with experience, understanding, awareness, context, purpose and expertise that enables someone to take action."

It was also discovered during the course of this research study that, like knowledge, there is no one agreed definition as to what the terms information and data refer to. After considering the views and findings of others, together with the

nature of information and data, working definitions were developed on these terms as well.

The working definition for information used for this research study was:

> "Data which has relevance, purpose and context added to it."

Whereas the working definition for data used in this research study was:

> "Objective facts or records about an event."

5.2.2 Knowledge Management

Just as there is no one agreed definition of what data, information and knowledge are, the review of literature in the field revealed that there is no one agreed definition of knowledge management.

After considering the working definitions used by other researchers and knowledge management writers, a working definition of knowledge management was developed for the purposes this research study. This was:

> "The systematic process of capturing organisational knowledge, and the sharing of this to aid achievement of organisational aims and objectives."

The literature review revealed that one of the key drivers for the evolution of knowledge management has been the development of an environment where organisational knowledge creation, storage, sharing and use have taken on added significance. In this environment, knowledge has become an economic resource (Drucker, 1993).

This had led to a desire to ensure that the value of organisational knowledge is maximised. To achieve this, organisations have used knowledge management as a way of aiding organisational knowledge's transfer and use, to add to its value.

It was also discovered through conducting the field research that some organisations which had implemented knowledge management initiatives recommended that the initial step for knowledge management work was for organisations to define what the term knowledge management means to them. This was seen as an important move that helped limit later confusion about what organisational knowledge should be captured and used within knowledge management initiatives.

5.3 Knowledge Use and Creation

The overall research question included in this area was: how is knowledge created and used within organisations? The outcomes from the review of the literature in the field suggested that the following topics and research sub-questions should be explored in the field research conducted in relation to this question:

- Do organisations undertaking knowledge management initiatives believe that data, information and knowledge can be managed?
- What level of importance is placed on organisational data, information and knowledge?
- How do organisations identify or know what is critical knowledge for the organisation?
- Do organisations have a knowledge strategy or is knowledge referred to within organisational objectives?
- Do organisational cultures and norms in organisations implementing knowledge management initiatives need to be altered or are organisations with cultures which support knowledge creation and sharing better suited to implementing knowledge management initiatives?
- Does the organisational cultures in studied organisations support knowledge sharing behaviours?
- Do organisations implementing knowledge management initiatives provide for and support knowledge-sharing processes and encourage their staff to share what they know?
- Do organisational cultures in organisations studied support knowledge-sharing behaviour and could they be described as knowledge friendly?

Each of these research questions is discussed below in terms of what literature in the field suggested, and then compared and contrasted with what was discovered from the field research carried out.

The literature in the field suggests that, while it is possible to manage knowledge related processes, like organisational knowledge-creation processes, it is not possible to manage knowledge itself (Von Krogh, Ichijo & Nonaka, 2000 and Nonaka & Takeuchi, 1995).

This is something that all organisations that implement knowledge management initiatives should either be aware of or have a view on. Therefore, the field research conducted began with exploring and testing with the organisations studied whether they consider that organisational knowledge can be managed or not.

It was surprising to find that half of the participants taking part in the field research believed that it is possible to manage knowledge. This did not accord with the findings from the literature review. The remaining half of interviewees were of the view that knowledge cannot be managed, as it is bound to people. This did echo the views uncovered in the literature review.

In terms of the ability to manage information and data, interviewees were more convinced that information and data could be managed than knowledge. All of the research study participants believed that both information and data could be managed by organisations, while only half considered that knowledge could be managed outright.

When asked about the level of importance placed on organisational data, information and knowledge, all interviewees considered that knowledge is very important, while information and data were rated to be incrementally less so. There was a graduated difference in the values that selected organisations placed on data, information and knowledge in turn.

Knowledge was seen as most important, followed by information, then data in terms of overall rankings. Thus, the organisations studied supported the view that knowledge is seen as the most valuable element along a data, information and knowledge continuum, according with the ideas of Grover & Davenport (2001).

Having a vision for the use of knowledge within organisations was considered to be important (Nonaka & Takeuchi, 1995 and Von Krogh, Ichijo & Nonaka, 2000), along with embodying knowledge in a knowledge strategy or the overall group of strategies/strategic direction of an organisation (Earl, 2001). Interviewees were asked whether knowledge is referred to within organisational objectives, to gauge if organisations see knowledge as an important component of supporting the achievement of organisational objectives or delivering superior organisational performance.

In response, most of the interviewees (seven out of eight) responded that yes, their organisation's objectives did make a reference to knowledge. However, on further questioning, this reference to knowledge tended to be implicit rather than explicit.

What was telling was that interviewees who considered that knowledge is implicitly referenced in their organisation's strategies and objectives often gave the impression that they thought that knowledge ought to be explicitly included in organisational objectives, particularly after they had rated knowledge as being very important to their organisations. This overall result for this question did not resonate with the views of Earl (2001).

However, it could be explained by the fact that New Zealand is said to be in its infancy as far as knowledge management adoption is concerned. It may be that in time, more emphasis is placed on organisational knowledge's value in the organisations studied, after knowledge management work has been bedded in more.

One of the ideas which occurs in the literature of the field is that organisational cultures have to be such that knowledge creation and sharing can be supported (Nonaka & Takeuchi, 1995 and Von Krogh, Ichijo & Nonaka, 2000). Furthermore, the elements of trust and care need to be present in organisational cultures to support knowledge-related processes (Nonaka & Takeuchi, 1995, Von Krogh, Ichijo & Nonaka, 2000 and McInerney & Le Fevre, 2000)

It was explored with interviewees whether organisational culture and norms in their respective organisations support knowledge sharing and creating behaviours, as cultural barriers such as reluctance to share knowledge, the lack of a knowledge-friendly culture or a knowledge-sharing culture, and the lack of trust in an organisation, are said to impede knowledge management initiatives (McDermott, 1999, Damodaran & Olphert, 2000, McCune, 1999 and Scarbrough, 1999).

Interviewees were asked if the culture of their respective organisation supports knowledge-sharing behaviours. It was found that the majority (six out of eight) of interviewees either *strongly agreed* or *agreed* with the statement that their organisational culture supports this.

Questions were also posed to interviewees to discover if organisations that implement knowledge management initiatives provide for knowledge-sharing processes and encourage their staff to share what they know. In particular, interviewees were asked about the extent to which they considered that their organisations motivate staff to share what they know.

On balance, most participants taking part in this study agreed with the statement that their organisation motivated staff to share what they know. However, all interviewees had rated knowledge as being very important to their organisation.

This result suggested that motivating staff to share what they know is an issue in the studied organisations.

These organisations taking part in this research study also tended to demonstrate "knowledge-friendly" characteristics (six out of eight interviewees *agreed* that their organisation's culture was "knowledge friendly"), although it was not apparent whether this condition applied to these organisations prior to carrying out knowledge management initiatives.

This also raises the questions of whether organisational knowledge cultures and norms have to be altered in organisations implementing knowledge management initiatives or whether organisations with cultures which support knowledge creation and sharing are better suited to implementing knowledge management initiatives than those without these supporting characteristics.

Organisational cultural issues often have a significant bearing on the success of knowledge management initiatives. Knowledge management initiatives are said to be best suited in organisations where trust-based and knowledge-sharing cultures are predominant (Damodaran & Olphert, 2000 and Davenport, de Long & Beers, 1998).

Given the relative importance of organisational cultures on knowledge creation and sharing processes within organisations, and the need for cultures which promote trust and care, it was surprising to discover that organisations studied did not appear to place a larger emphasis on motivating staff to share what they know. The results against research questions aimed at exploring organisational cultures in the studied organisations suggested that more work would be needed in this area to ensure that over a long term, organisational cultures would be in place that better motivated staff to share knowledge and support knowledge-related processes.

5.4 Developing and Implementing Knowledge Management Initiatives

The overall research question included in this area was: what are the commonly used and researched approaches to developing and implementing knowledge management initiatives? The outcomes from the review of the literature in the field suggested that the following topics and research sub-questions should be explored in the field research conducted in relation to this question:

- Should organisations planning to undertake knowledge management work take time to consider what knowledge management means to them before beginning work on knowledge management initiatives?
- How would organisations ensure that this concept of knowledge management is commonly understood within the organisation?
- Do organisations implementing knowledge management initiatives draw distinctions between data, information and knowledge?
- Do knowledge management practitioners and organisations that have implemented knowledge management initiatives see the distinction between data, information and knowledge as sharply was researchers and management writers in the field? Do they consider this as an important element in carrying out knowledge management work?
- Have organisations that have implemented knowledge management initiatives begun with developing a knowledge management strategy?
- Are knowledge management strategies linked to other organisational strategies or the strategic direction in studied organisations?
- How do organisations that have implemented knowledge management initiatives ensure that the knowledge contained within systems is what the organisation requires and is relevant and current?
- How much use does material in knowledge management systems and stores receive in the organisations studied?
- What range of knowledge management storage systems is used in studied organisations?

- Are knowledge maps and repositories the most commonly used knowledge management systems in New Zealand State sector organisations?

- Have organisations with knowledge management initiatives chosen to make or buy knowledge management systems, and have they had outside help in developing and implementing their knowledge management initiatives?

- Have organisations with knowledge management initiatives received leadership support?

- What level of leadership support have implemented knowledge management initiatives received in studied organisations?

- Has this made a difference to the success of the knowledge management initiative?

Each of these research questions is discussed below in terms of what literature in the field suggested, and then compared and contrasted with what was discovered from the field research carried out.

One of the issues raised by Von Krogh, Ichijo & Nonaka (2000) is that organisations should take time to consider what knowledge means to them, in the context of their organisation. This raises the question: should every organisation planning to undertake knowledge work take time to consider what knowledge means to them particularly before they begin any other work? ie, should this be an early step?

Once organisations have considered what knowledge means to them, it would be interesting to know if they can then apply what the concept of knowledge is to their organisation practically; ie, once they have identified what knowledge is, how would they ensure that this is commonly understood within the organisation and how would they apply this concept of knowledge on a practical basis? ie, would they treat knowledge differently having defined it?

An unexpected finding from exploring data, information and knowledge with interviewees was that they considered that, when carrying out knowledge management initiatives, organisations need to consider and define what data, information and knowledge mean to them. This provides a common understanding of concepts necessary to guide knowledge management work.

This finding had not originally been anticipated, and specific questions around this were not included in the interview guide/questionnaire. However, during the interviews a discussion was held about the working definitions used for the terms

data, information and knowledge where this observation was made. These working definitions were largely agreed to and accepted by interviewees taking part in this study.

Following on from this issue, it was considered to be useful to know if organisations implementing knowledge management initiatives draw distinctions between data, information and knowledge. It was also considered beneficial to see if knowledge management practitioners and organisations that have implemented knowledge management initiatives see the distinction between data, information and knowledge as clearly as researchers and management writers, and if they consider this important in carrying out knowledge management work.

It was also determined from the general discussions held about working definitions, that the organisations studied tended to draw distinctions between data, information and knowledge, particularly when implementing knowledge management initiatives. However, for the organisations studied, distinguishing the difference between knowledge and information was problematic.

In particular, it became obvious when questioning participants about the storage and use of knowledge and information that organisations have difficulty distinguishing knowledge from information. Interviewees shared the difficulty expressed by knowledge management writers that these two terms are hard to distinguish and tell apart. For some organisations, knowledge and information are managed in such similar ways that interviewees from some organisations tended to believe that there was little to be gained from viewing knowledge and information as separate ideas.

However, on balance, it was considered that knowledge and information are linked ideas. But while they share some similar characteristics, they are used in different ways for different purposes. Essentially, knowledge prepares someone to take action and draw from experience whereas information is more factually based and provides a less rich message.

Some knowledge management writers believe that the best place to start a knowledge management initiative is to develop a knowledge management strategy that guides an overall knowledge management programme. There are various models that can be used, including those presented by Earl (2001), Hansen, Nohria & Tierney (1999), and Davidson & Voss (2002). These knowledge management writers advocated that having a knowledge management strategy was the natural place to begin a knowledge management initiative.

This was borne out by the research undertaken as five (or 62.5%) organisations had commenced knowledge management work with developing knowledge management strategies. The remaining three (37.5%) organisations who hadn't implemented knowledge management initiatives have all committed to developing knowledge management strategies as the initial stage in the knowledge management work to be carried out.

This would appear to be a positive step. Infinity Solutions 2002 knowledge management survey found that organisations with either an informal or no knowledge management strategy had achieved moderate success with knowledge management initiatives. In contrast, organisations with formal knowledge management strategies had found that knowledge management initiatives had been either successful or very successful.

This suggested that having a knowledge management strategy made a positive difference. It also seems to have held true for the New Zealand State sector organisations studied that have implemented knowledge management initiatives. These were largely considered to be successful from the research conducted in the field.

The organisations studied have all tended to begin knowledge management work with the starting step of establishing a knowledge management strategy. On this basis, it would appear pragmatic to begin knowledge management work in State sector organisations by developing a knowledge management strategy.

It is noted that any knowledge management strategy adopted, like knowledge management initiatives, needs to be championed and led from the top of the organisation to be successful.

The question of the importance of integrating knowledge management strategies with other organisational strategies and objectives met with a mixed response from interviewees. Only two of the eight organisations studied had linked knowledge management strategies to other strategies. It was not clear whether organisations taking part in this study considered that this wasn't important or they didn't see value in integrating knowledge management strategies with other organisational strategies.

Earl (2000) points out that it is assumed that by paying more attention to creating, sharing and using knowledge organisational performance will improve. However, this is not guaranteed. Organisations cannot expect to automatically improve performance by implementing knowledge management initiatives.

It was also considered useful to know if organisations only store knowledge and information in knowledge management systems or actually use a wider array of storage systems, and also how much use this material receives once it has been included in a knowledge management system.

The organisations studied tended to store knowledge in combined paper- and electronic-based knowledge stores but did not monitor the amount of use this knowledge gets.

Measuring the amount of use that knowledge management systems receive in the organisations studied is relatively rudimentary, suggesting that more work needs to be done in this area. Organisations tended to have limited measuring systems, which implied that the organisations studied are not aware of the use that knowledge management systems get. This was an unexpected finding as it was anticipated that organisations with knowledge management systems would want to monitor the amount of use these get.

The literature review suggested that organisations should have some idea that the knowledge and information they collect in knowledge management systems is what the organisation needs and is current and relevant. They also have to think about the type of knowledge captured.

Ensuring that the knowledge that gets captured in stores or systems is what is needed is something that most organisations that had implemented knowledge management initiatives have taken a pragmatic approach to.

Given the suggestion from the literature review that knowledge management initiatives often fail as organisations undertaking them were not aware of the knowledge that was critical to the business or understand what data, information and knowledge staff needed to perform their jobs, participants were asked how their respective organisations identify what is critical knowledge to them. From the responses given by interviewees, it became obvious that the organisations studied had some difficulty with this.

In particular, three out of eight interviewees said that their organisation could identify what organisational knowledge was critical to business success. However, most other interviewees commented in response that their organisations know what *information* was critical to the organisation. This led to the view that organisations have difficulty in practice distinguishing knowledge from information, or use similar processes to manage both concepts.

This was an unexpected result, given that five out of eight organisations had implemented a knowledge management initiative. It was originally considered that they would have been likely to know what organisational knowledge was critical to success.

However, one of the key findings from asking organisations about how they store and use knowledge and information was that organisations have difficulty distinguishing what was stored as an item of knowledge, as opposed to an item of information. This tended to suggest that the organisations studied either saw them as the same thing or had processes that managed them in the same manner.

This could create issues further down the track for the organisations involved when significantly more knowledge and information are lodged into knowledge bases and systems. McCune's (1999) contention is that organisations often capture data, information and knowledge that doesn't get used at all because the organisation didn't find out what types of data, information and knowledge were most valuable and needed. Organisations need to be confident that the knowledge and information they capture is what is really required and is focused on areas that are critical to the organisation.

Some organisations have implemented supporting systems and processes which are aimed at ensuring that knowledge kept in knowledge management systems is up to date. However, it was found that some organisations don't do enough around this and may find that without a formal process being developed their knowledge management systems will be adversely affected by not being able to keep knowledge contained within them current.

It is also advocated in the literature in the field that the most common form of knowledge management systems are knowledge maps and knowledge repositories. It was considered useful to know if this case applies to New Zealand knowledge management initiatives implemented in the State sector.

It was found that in the organisations studied, the most commonly used knowledge management systems were intranets, the Internet, electronic yellow pages, knowledge repositories and management information systems (in that order). The least commonly used knowledge management systems were decision-support systems, knowledge maps, knowledge webs, kiosks and portals.

This result suggested that knowledge repositories are used in New Zealand State sector organisations, which concurred with the literature review's findings. However, it was found that there is little use made of knowledge maps in the

studied organisations, which was contrary to the literature review findings. This could be explained by New Zealand's relatively late adoption of knowledge management.

Given that the New Zealand market for knowledge management is relatively young, it was canvassed with interviewees if their organisations had chosen to either make or buy knowledge management systems, and whether they had engaged external assistance in developing and implementing knowledge management initiatives. This was in order to decide if it would be advantageous for New Zealand State sector organisations to seek help in implementing knowledge management initiatives.

In response, it was found that all five of the organisations that had implemented knowledge management initiatives had used external help to assist with their knowledge management project. Sometimes this had been limited to providing advice at the design stage, while in other instances it had been provided for all stages of the knowledge management initiatives.

In regard to the types of knowledge management systems designed or purchased by the organisations studied, there were two distinct themes: make or buy. Choice of off-the-shelf or customised systems tended to be dictated by organisational IT practices (that is, whether they generally prefer to make or buy). There was no one clear choice; results were evenly split.

Knowledge management initiatives are said to need large input by end users (Pfeffer & Sutton, 1999). The research in the field found that studied organisations that have implemented knowledge management initiatives had large internal involvement in this. All organisations had canvassed organisational-wide views about what needed to go into the knowledge management initiative and system. Organisational size often dictated the extent of this internal involvement.

For the organisations that have implemented knowledge management initiatives, most have organisational knowledge creators and users maintain the knowledge captured within knowledge management systems. This in part ensures that the most appropriate knowledge is captured in knowledge management systems and that users take an active part in supporting knowledge management systems.

An important aspect raised throughout the review of literature in the field was that leadership and senior management buy-in is critical not only for influencing the creation and sharing of organisational knowledge (Nonaka & Takeuchi, 1995 and Von Krogh, Ichijo & Nonaka, 2000), but also regarding the success of knowledge

management initiatives (Malhotra, 2000, Damodaran & Olphert, 2000 and the OECD, 2001).

Thus, leadership and support from the top of the organisation have been identified as elements that must be present in every successful knowledge management initiative.

In response to questions around discovering the extent to which organisational leaders supported knowledge management initiatives, there was an overwhelming sense of chief executive and senior management support for the knowledge management initiatives carried out within each of the studied organisations. All participants indicated strong agreement with the statement that their chief executives had supported their knowledge management programme or initiatives[8].

There was also strong agreement that the chief executive's support has had an impact on the success of knowledge management programmes. Specifically, seven out of eight interviewees considered that chief executive support of the knowledge management initiative has had a positive effect.

[8] One organisation had a new chief executive and couldn't rank this question, but it was noted that their former chief executive had been a strong advocate for the knowledge management work undertaken.

5.5 Knowledge Management Use in Studied Organisations

The overall research question included in this area was: what use of knowledge management is made in a range of New Zealand State sector organisations? The outcomes from the review of the literature in the field suggested that the following topics and research sub-questions should be explored in the field research conducted in relation to this question:

- What has been the extent of knowledge management work undertaken New Zealand State sector organisations?
- How far advanced are the knowledge management initiatives that have been implemented in the organisations studied?
- What sorts of timeframes have been used for the development and implementation of knowledge management initiatives in the organisations studied?

Each of these research sub-questions is discussed below in terms of what literature in the field suggested, and then compared and contrasted with what was discovered from the field research carried out.

As highlighted by the OECD (2001), internationally, government sector organisations risk falling behind the private sector in terms of the pace for adoption of knowledge management initiatives. So the extent and timeframes used for adopting knowledge management initiatives was explored with the organisations studied.

It was recognised that, in the local context, the New Zealand Government has implemented a range of activities to promote New Zealand becoming a knowledge-based economy. This was considered likely to have an impact on how New Zealand State sector organisations are likely to manage their knowledge and information to support this aim.

In regard to the overall research question of investigating the use of knowledge management in a range of New Zealand State sector organisations, a total of eight organisations took part in this study. Given that this represents a relatively low number of State sector organisations in New Zealand (as compared to the total

number of organisations which collectively make up the State sector) it would appear that the assertion made by the OECD (2001) has some relevance.

This rate of knowledge management adoption in New Zealand State sector organisations would tend to suggest that there has been a slow uptake of knowledge management in the State sector.

However, organisations studied were asked about how far advanced their individual knowledge management initiatives were. It was surprising to discover that three of the eight organisations studied had been relatively early adopters of knowledge management practices and were at the post-implementation stage with knowledge management initiatives.

In particular, the earliest knowledge management initiative in a New Zealand State sector organisation was developed and implemented in 1997 (followed by work in 1999 and 2000 respectively for other early adopters). This timeframe would accord with Stage Two of the overall knowledge management development timescales highlighted in the literature review (Section 2.2.2).

This finding was not anticipated, as literature in the field speculated that the market for knowledge management in New Zealand is in its infancy. The remaining organisations studied have been relatively late adopters of knowledge management initiatives, which in part would accord with the OECD's (2001) assertion that the government sector is somewhat behind private sector practices relating to knowledge management.

One of the knowledge gaps identified from the review of literature in the field was that there is little information available about the length of time it takes to design and implement knowledge management initiatives. The experience for all organisations studied that have implemented knowledge management initiatives shows that it takes an average of two years to move from design to implementation stages. This tends to suggest that knowledge management's use should not be considered as a short-term or quick-fix solution.

In addition, interviewees taking part in this study from organisations who had been early adopters of knowledge management all spoke about how much more work was needed on their individual knowledge management initiatives. Collectively they gave the impression that mastering knowledge management was a continual process, which did not end at implementing a knowledge management initiative. This very much resonated with Davenport's (1998) views.

It will be interesting in time to see if more New Zealand State sector organisations opt to use knowledge management based on the results achieved by some of the organisations studied or to meet stated e-Government goals in the future. Some of organisations included in this study may have become role models for knowledge management studies by other local and international State sector organisations.

5.6 Lessons Learned

The overall research question included in this area was: what can New Zealand State sector organisations learn from the development and implementation of knowledge management initiatives that have already been undertaken in the State sector? The outcomes from the review of the literature in the field suggested that the following topics and research sub-questions should be explored in the field research conducted in relation to this question:

- What have been the important learnings in the organisations studied from the knowledge management initiatives undertaken?
- What have been the positive and negative experiences of the knowledge management initiatives undertaken in the organisations studied?
- How do knowledge management initiatives undertaken in New Zealand State sector organisations differ and in what ways are they similar?

Each of these research sub-questions is discussed below in terms of what literature in the field suggested and then compared and contrasted with what was discovered from the field research carried out.

The review of literature in the field revealed that there is little published research regarding the adoption and implementation of knowledge management initiatives within New Zealand State sector organisations. It therefore became necessary to conduct field research as part of this thesis to ascertain the current state of knowledge management's use within the New Zealand State sector.

A focus of the field research was therefore to determine what the important learnings have been in the organisations that have carried out knowledge management work to date. Overall lessons learned and benefits experienced by the organisations that had undertaken knowledge management initiatives had included: developing knowledge-sharing cultures and environments; and achieving cultural and behavioural changes.

Important learnings from the experiences explored in New Zealand State sector organisations included issues such as leadership support, cultural impacts, having a shared understanding of knowledge management, treating knowledge management as a continual process, and using knowledge management to implement cultural changes.

Key cornerstones for knowledge management initiative success included having good leadership of the knowledge management initiative by chief executives and senior management, having the right sort of overall project leader for the knowledge management initiative and having a knowledge management champion at senior level. Leadership support had made a definite difference for knowledge management initiatives in the organisations studied.

Organisations that had implemented knowledge management initiatives had experienced cultural barriers such as lack of knowledge sharing, lack of trust, having siloed organisational cultures, lack of staff willingness to share knowledge and staff not seeing the value of contributing to organisational knowledge bases and systems. It is these very sorts of conditions that Nonaka & Takeuchi (1995), Von Krogh, Ichijo & Nonaka (2000) and Nonaka, Toyama & Nagata (2000) describe as being the stumbling blocks that hamper knowledge-related processes and knowledge management work.

To overcome and counteract cultural resistance to change, such as those conditions included above, two organisations that had implemented knowledge management initiatives had chosen to implement change management and communications streams of work to support overall knowledge management programmes.

Some organisations studied had found that there was still staff resistance to knowledge management some time after knowledge management initiatives had been implemented. These organisations continued to work on this area to ensure that staff didn't think about knowledge management in compliance terms (sharing knowledge because they were forced to) and were able to willingly share their knowledge.

Having a shared understanding and a common understanding of knowledge management was seen as key. Several organisations highlighted the importance of defining knowledge management for individual organisational use and ensuring that this definition is widely accepted and understood within the organisation.

Organisations with successful knowledge management initiatives found a challenge in not becoming complacent and are currently trying to focus on where they should further improve their initiatives. This echoed the ideas raised in the literature review of Davenport (1998) who believes that knowledge management is a never-ending process, and also Nonaka & Takeuchi (1995) and Von Krogh, Ichijo & Nonaka (2000) in terms of treating knowledge creation as a continually spiralling process.

The key drivers that had caused the organisations studied to embark on knowledge management initiatives were predominantly change based. Organisations had tended to use knowledge management to affect cultural change and staff behaviour change, in response to: having a new chief executive; wishing to stem the loss of organisational knowledge and corporate memory; and recognising the importance of organisational knowledge to the business.

Organisations were often seeking ways to break down siloed cultures and promote the greater sharing of organisational knowledge. Knowledge management was seen as an effective means to achieve this in the organisations studied.

Organisations were asked to highlight the benefits and positive outcomes incurred from conducting knowledge management work. The three key positive outcomes achieved had been: creating better recognition about the importance of organisational knowledge; achieving greater knowledge sharing; and having improved access to organisational knowledge. In particular, organisations had found that there had been a greater awareness and understanding about the role that organisational knowledge plays in the organisations.

It had also been a common finding that knowledge sharing had increased substantially for some organisations (notwithstanding the fact that some organisations acknowledge that they still had work to do in this area). Organisations studied had found that staff were a lot more willing to share their knowledge after knowledge management initiatives had been implemented, along with benefits in being able to easily access knowledge and information, and key people.

In regard to negative outcomes from carrying out knowledge management work, the organisations studied had found a variety of issues. These range from taking too long in some organisations to implement changes and not thinking about the impact of changes, or implementing knowledge management initiatives too fast for other organisations (in terms of ensuring that staff didn't suffer change fatigue), through to being overwhelmed by the extent of change required.

On balance, there were fewer negative outcomes from undertaking knowledge management work than positive.

If presented with the opportunity to begin a knowledge management initiative again, one interviewee commented that they wouldn't call the initiative a knowledge management project; they would choose another label to avoid confusion over terms. Others would consider taking shorter development times or

conversely extending compressed timeframes, to achieve better and smoother implementation. Some would change the scope of the project to be less ambitious and more achievable in terms of impact on staff.

One of the aims of this research study was to investigate different approaches to knowledge management's development and implementation. All eight of the New Zealand State sector organisations taking part in this study have approached knowledge management in different ways, through a variety of different processes, largely as a result of having different organisational needs and drivers. This confirmed the view that there is no single overall right way to go about developing and implementing knowledge management initiatives.

It was interesting to note that a common feature and a similarity in all studied organisations was that all organisations used knowledge management strategies in the preliminary processes connected with developing and implementing knowledge management initiatives. This was not anticipated, but showed that organisations considered a natural starting point of knowledge management work to be developing a knowledge management strategy.

All in all, of the organisations studied those that had implemented knowledge management initiatives had been successful at this. Most have had issues to deal with as the initiative has progressed, but there was a real sense, that on balance, the knowledge management programme embarked on had been worthwhile and had delivered anticipated results and benefits.

In response to the question of whether organisations valued their knowledge management initiative, interviewees largely *agreed* that this was the case. The organisations studied had found that there had been tangible benefits and value in carrying out knowledge management work.

In terms of differences between the knowledge management initiatives implemented, one organisation studied was going through a significant amount of change and interviewees from it commented that they wouldn't recommend tackling knowledge management around the same time as undertaking other significant organisational change projects. For the organisation concerned, this had the impact of delaying the knowledge management initiative and changing its shape significantly from what had originally been agreed to.

Another organisation studied saw the key to knowledge management success for them as being to focus their knowledge management initiative primarily on supporting staff and meeting their needs. They recommended starting a knowledge

management initiative with the end users' point of view in mind, and focusing the knowledge management initiative around end users and their needs.

In terms of similarities and differences in practices, it was found that implementation of knowledge management initiatives had occurred using a variety of methods. Some organisations chose to develop knowledge management strategies first then, after consulting with staff, built knowledge management programmes around this, while others went for an initial design focused around the most frequently asked questions in an organisation, which became the genesis for a piloted knowledge base.

Some organisations centred their knowledge management initiatives and implementation programmes on culture changes and behaviour changes needed within the organisation. Another implementation method had been driven by examining processes for knowledge gaps and designing a knowledge management solution to fill these.

SECTION 6 – CONCLUSION

6.1 Introduction

The key goal and objective of this thesis is to examine the role that knowledge management plays in New Zealand State sector organisations, to ascertain if they could potentially gain advantages from adopting knowledge management. A secondary goal is to discover how New Zealand State sector organisations benefit from using knowledge management.

To reach the stated goals and objectives of this thesis, the following framework was adopted to guide supporting research:

- Considering how knowledge is created and used in organisations.
- Investigating different approaches to developing and implementing knowledge management.
- Investigating the use of knowledge management in a range of New Zealand State sector organisations.
- Determining if New Zealand State sector organisations can learn from the implementation of knowledge management initiatives that have already been undertaken in the State sector.

In terms of the central argument of this thesis, the key goal and objective was ascertaining if New Zealand State sector organisations can potentially gain advantages from adopting knowledge management; it was found from the research conducted that these organisations do gain advantage from using knowledge management. In particular, all organisations studied had found value from carrying out a knowledge management programme or initiative. Interviewees taking part in the study all considered that their knowledge management work had been worthwhile and that their organisations valued the work undertaken.

That said, it should be noted that there had been pockets of resistance experienced in the organisations studied (who had implemented a knowledge management initiative) in relation to the knowledge management work carried out. However, it was found that this had been overtaken by the success achieved for the overall programme carried out. The findings relating to these ideas are explored in more depth in sections 6.2, 6.3 and 6.4 below.

In regard to the secondary goal of this thesis on discovering how New Zealand State sector organisations benefit from using knowledge management, it was found that the key benefits that had resulted from knowledge management work had been to achieve organisational culture and organisational knowledge-related changes. These benefits included gaining better access to organisational knowledge, developing a better awareness of the importance of organisational knowledge and encouraging better knowledge sharing behaviours within organisations.

One of the important findings that came out of the field research conducted was that it tends to take two years to development and implement knowledge management initiatives in New Zealand State sector organisations. This indicates that knowledge management work should not be viewed as a quick-fix solution. When considered against the context of the organisational cultural changes experienced in the studied organisations, this result shows that knowledge management cannot be thought of as a short-term undertaking

It was also found that all organisations studied had begun knowledge management work by developing a knowledge management strategy and that this had provided a useful roadmap to guide subsequent knowledge management programmes and initiatives. The organisations taking part in this research study had found benefit in beginning with this step.

It was discovered that the studied organisations had, on balance, found that the knowledge management work undertaken had been worthwhile and had delivered anticipated results and benefits. Based on these findings, it is concluded that New Zealand State sector organisations do benefit and can benefit from using knowledge management. The findings relating to these ideas are categorised around the following three groups of questions: were the results achieved what was expected; what findings differed from previous research; and what new discoveries were made? Each of these is discussed below.

6.2 Were the Results what was Expected?

There were a number of results discovered from undertaking this research study, which largely accorded with the findings from the literature in the field. These are discussed in detail below.

The literature in the field revealed that one of the main reasons why knowledge management initiatives fail is due to fact that these either are not led or driven from the top of the organisation or that senior management buy-in to support knowledge management work is not obtained.

One of the most significant findings from this research study has been that for all organisations studied there was strong evidence of both chief executive and senior management support for the knowledge management initiatives carried out or planned. This has had a positive effect for the knowledge management work undertaken in the organisations examined, and has added to the success of knowledge management programmes for these organisations that have implemented knowledge management initiatives.

It was suggested in the literature review findings that knowledge repositories and knowledge maps are the most commonly used forms of knowledge management systems. However, from the field research conducted, it was found that the New Zealand State sector organisations studied have all tended to use common knowledge management systems such as knowledge repositories, along with the Internet, intranets, and electronic yellow pages. In contrast none of the studied organisations are using knowledge maps. This result is likely to be caused by New Zealand's relatively late adoption of knowledge management practices.

From the literature review, it was found that there is a view expressed that knowledge forms part of a hierarchy of ideas, starting with data, then information and then knowledge. Out of this series, knowledge is said to be the most valuable element. These ideas were explored in the field research conducted, and it was discovered that knowledge management practitioners in New Zealand State sector organisations studied also shared the view that there is a graduated difference in the values of data, information and knowledge.

Participants in this research study spoke of their respective organisations placing considerably more value on knowledge than on the other two elements, then ranked information as having more value than data. This finding accorded with what was suggested in the literature in the field.

One of the important discoveries from carrying out the literature review was that organisations need to have cultures that support knowledge creation and sharing and other knowledge-related processes (McInerney & Le Fevre, 2000, Nonaka & Takeuchi, 1995 and Von Krogh, Ichijo & Nonaka, 2000), along with the elements of trust and care (Nonaka & Takeuchi, 1995 and Von Krogh, Ichijo & Nonaka, 2000). This discovery was important as these cultural conditions need to be present in organisations implementing knowledge management initiatives to aid their success.

Questions were posed with interviewees to gauge the extent that their organisations support knowledge-sharing behaviours and could be described as knowledge friendly as suggested above. In response, it was found that organisational cultures in the studied organisations did support knowledge sharing and demonstrated knowledge-friendly characteristics.

As suggested by literature in the field, organisations studied had experienced cultural barriers when implementing knowledge management initiatives. These included lack of knowledge sharing, lack of trust, having siloed organisational cultures, lack of staff willingness to share knowledge and staff not seeing the value of contributing to organisational knowledge bases and systems. However, their treatment of these issues through having complementary change management and communications workstreams had helped overcome the barriers experienced.

Organisations studied that had implemented knowledge management initiatives had continued to grow or develop their knowledge management programmes, supporting Davenport's (1998) view that knowledge management is a continual process. Interviewees from these organisations commented that their organisations still had work to complete or progress on their knowledge management initiatives.

The literature review revealed that knowledge management systems need to have a large input by end users. There is an expectation that staff need to become involved in knowledge management system design, implementation and maintenance.

For the organisations studied, staff members have had a large involvement in knowledge management system design and most organisations have knowledge creators and users maintain knowledge captured within knowledge management systems. In this regard, users have taken an active part in supporting the implementation of knowledge management initiatives. This finding accorded with what the literature review suggested.

6.3 What Findings Differed from Previous Research?

The literature in the field places significant emphasis on the fact that knowledge cannot be managed (Nonaka & Takeuchi, 1995 and Von Krogh, Ichijo & Nonaka, 2000). However, from the field research conducted, it was suggested by half of the research participants that knowledge could be managed. These contrasting views were hard to reconcile. On balance, it was considered that as knowledge is human-based (initially residing in people's minds) it is not possible to manage.

All interviewees taking part in this research study considered that their respective organisations strongly valued knowledge. From the literature review conducted it was suggested that if organisations do value knowledge, its importance is recognised and stated in organisational strategies and objectives, along with overall strategic directions.

However, interviewee's answers to questions aimed at exploring whether knowledge is referenced within organisations' strategic directions or organisational objectives and strategies revealed that knowledge was predominantly not included in this material, but was implicitly reflected. Most interviewees seemed uncomfortable with this situation and gave the impression that they thought knowledge should be explicitly included in organisational strategies and objectives.

It was suggested from the literature review findings that many knowledge management initiatives fail as organisations don't capture knowledge that is needed by staff to perform their jobs (Pfeffer & Sutton, 1999 and McCune, 1999). This idea was tested at some length with research participants. In particular, interviewees were asked if their organisations knew what knowledge and information was critical to organisational success, and how their organisations ensured that this material is captured and stored in knowledge management systems.

In response, most interviewees commented that their organisation knew what critical information was, but couldn't easily distinguish what critical knowledge was or how critical knowledge and information differed, due to having similar management and storage processes for both. It was considered this could provide complications for these organisations in the future, as they may find that knowledge or information that doesn't get used or is not critical to the business has been captured in knowledge management systems, due to the lack of focus on capturing what is really needed.

The review of literature in the field suggested that organisations have to be confident that organisational knowledge captured in knowledge management systems for use is what the organisation needs and is used. However, in the organisations studied it was found that organisations seldom measure or monitor the use that knowledge management systems get, or the amount of use that knowledge contained in knowledge management systems gets. This could prove to be problematic over time.

Likewise, some of the organisations studied do not use systems and processes to ensure that knowledge captured is kept up to date. This could become an issue for them over time if knowledge management systems become cluttered with out-of-date material. Staff will be less inclined to use these systems, which could defeat the overall aim of using knowledge management as a tool to arm people with knowledge to take action.

6.4 What New Discoveries were Made?

The research in the field conducted resulted in new discoveries being made, which add to the body of literature regarding knowledge management and its use. The new discoveries made are discussed in detail below.

One of the significant new discoveries made through conducting this research study was that all organisations studied had begun knowledge management work by developing a knowledge management strategy. This was surprising an unanticipated finding for this thesis.

It was found that all five of the organisations with knowledge management initiatives in place had begun with this step and that the remaining three organisations that were yet to implement initiatives were beginning their knowledge management programme with a knowledge management strategy. It would appear that for New Zealand State sector organisations creating a knowledge management strategy to guide knowledge management work is the first step taken. This finding strengthened the views of Earl (2001) and Davidson & Voss (2002).

Another unexpected discovery made from this research study was that studied organisations believed a positive step was made by having an agreed set of definitions around data, information and knowledge, together with knowledge management, before beginning knowledge management work. Interviewees believed that this was a necessary action in carrying out knowledge management work, as it helps set the boundaries of knowledge management programmes and introduced a common understanding about knowledge management.

It also helped avoid later issues around identifying organisational knowledge to be included within knowledge management initiatives. Based on this result, it would seem pragmatic for other New Zealand State sector organisations to consider and set their own definitions around knowledge, information, data, and knowledge management before beginning knowledge management work.

One of the problems uncovered in the review of literature in the field was that there are no single agreed definitions about data, information and knowledge, and that it is often difficult to tell knowledge and information apart. This led to an exploration in the field research into whether organisations and knowledge management practitioners draw as clear distinctions around the terms data, information and knowledge as knowledge management researchers.

It was not unusual to find that studied organisations had difficultly telling knowledge apart from information, when examining this in more depth with interviewees. However, it was surprising to find the extent that organisations go to in defining these terms at the beginning of knowledge management work programmes. Defining data, information and knowledge for organisations was considered important to knowledge management practitioners.

A finding that was not expected or anticipated when this research study began was that there have been some relatively early adopters of knowledge management within the New Zealand State sector. The earliest knowledge management initiative began in 1997, which was an unexpected finding. In particular, anecdotal advice was that New Zealand is a late adopter of knowledge management practices, and so this result came as a surprise.

The literature in the field around knowledge management is largely silent on the timeframes it takes to develop and implement knowledge management initiatives. This thesis can add to the body of knowledge management literature by reporting that on average it takes two years to develop and implement knowledge management initiatives in New Zealand State sector organisations.

Early adopters of knowledge management initiatives are continuing to refine and build upon their original knowledge management programmes. There is merit for tracking the progress made by these organisations over the short to medium term, and conducting a follow-up research study into how their knowledge management initiatives have grown or been altered.

It was found from conducting field research that the key drivers for New Zealand State sector organisations in adopting knowledge management was to primarily change organisational culture and behaviours around organisational knowledge. This was another unanticipated discovery.

In particular, organisations studied had undertaken knowledge management work to promote organisational change and to protect organisational knowledge. It had been assumed that there would have been a wider basis for using knowledge management than this. However, this result showed that knowledge management has benefits and advantages for New Zealand State sector organisations.

An unusual new discovery connected to this research study was that, although all organisations examined highly valued organisational knowledge and considered that organisational knowledge was important to the organisation's success, they often didn't have processes and practices in place to motivate staff to share their

knowledge. This finding seemed incongruous given the level of importance placed on knowledge by the organisations studied and the commitment made to developing and implementing knowledge management initiatives.

It is likely that the studied organisations will have to examine knowledge-related processes to ensure that more emphasis is placed on sharing organisational knowledge and providing staff with rewards and incentives to achieve this.

The literature review findings suggested that knowledge management initiatives can fail if organisations have these designed by parties that don't understand what knowledge and information staff need to carry out their jobs. However, it was found through field research that all organisations studied which had implemented knowledge management programmes and initiatives did have large staff involvement.

On the other hand, it was interesting to find out that all of these same organisations had engaged outside help and expertise to either develop and/or implement their knowledge management initiatives. For some organisations this had been limited to providing independent advice, while others had chosen to engage partners to assist with all stages of work.

This result is likely to have been caused by New Zealand's relatively recent adoption of knowledge management practices. It would also have been influenced by the nature of State sector organisations needing to be fiscally prudent with public funding, therefore taking care to ensure that outside expertise was sought to provide short-term supplementary capability.

As discussed in Section 5, the field research conducted clarified the nature of knowledge and its ability to prepare someone to take action by drawing on experience (which may have come from another source). This resulted in the working definition for knowledge used in this thesis being altered to cover the acceptance of others experience.

In summary, it had been found through this thesis that there were more positive outcomes experienced in organisations studied than negative outcomes from carrying out knowledge management work. None of the organisations studied had found that the knowledge management initiatives they had developed and implemented had not been of value.

The overall lessons learned from the New Zealand State sector organisations studied provide useful signposts and guidance for other similar organisations which

may choose to implement knowledge management initiatives. They point to the sorts of issues that have to be taken into account when designing and implementing knowledge management initiatives and programmes.

The overall findings made suggest that the organisations studied have become role models and mentors for other possible knowledge management development in the State sector. It will be interesting to see how quickly other New Zealand State sector organisations adopt knowledge management initiatives over the next five years, particularly to meet goals included in the current Government's e-Government strategy.

APPENDICES

Appendix 1 – Interview Guide/Questionnaire

INTERVIEW QUESTIONS OUTLINE

Purpose

The objective of this research is:

- "To discover if New Zealand State sector organisations can or do obtain benefit from using knowledge management and knowledge management systems."

Glossary of Terms Used

For the purposes of this interview, the following working definitions are provided for terms used.

Knowledge	Information that has been fused and blended with understanding, awareness, context, purpose and expertise that enables someone to take action.
Information	Data which has either relevance or a purpose or context added to it.
Data	Objective facts or records about an event.
Organisational Objectives	The organisation's stated strategic direction, which may include its mission or vision or strategic goals.
Knowledge Management Initiative	The knowledge management work or project that is being undertaken or has been undertaken in an organisation.

Scale Used

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Committee Approval Statement

This project has been reviewed, judged to be low risk, and approved by the researcher and supervisors under delegated authority from the Massey University Human Ethics Committee. If you have any concerns about the conduct of this research, please contact Professor Sylvia Rumball, Assistant to the Vice-Chancellor (Equity & Ethics), phone (06) 350-5249 or email humanethics@massey.ac.nz.

General – About Your Organisation

1. I understand your organisation's role is to _____

   Do you agree with this?

   ☐ Yes 1a.

   ☐ No 1b. You see its role as being what?

2. How many full time equivalents in your organisation?

To what extent do you agree or disagree with the following statements?

3. Knowledge is very important to my organisation.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

4. Information is very important to my organisation.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

5. Data is very important to my organisation.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

6. In your view, can knowledge be managed?

   ☐ Yes 6a. Because _____

   ☐ No 6b. Because _____

7. In your view, can information be managed?

   ☐ Yes 7a. Because _____

   ☐ No 7b. Because _____

8. In your view, can data be managed?

☐ Yes 8a. Because _____

☐ No 8b. Because _____

9. Is there a specific reference to knowledge in your organisation's organisational objectives?

☐ Yes 9a. Why? _____

☐ No 9b. Why not? _____

10. Does your organisation have a knowledge management strategy?

☐ Yes 10a. How did the organisation develop this?

10b. Is this strategy linked to other organisational strategies?

10c. Does this strategy support your organisation's organisational objectives?

10d. Who was involved in developing the strategy?

10e. What time frame was involved with developing the strategy?

☐ No 10f. Do you consider that a knowledge management strategy

would be beneficial for your organisation?

☐ Yes 10f.i Why?

☐ No 10f.ii Why Not?

11. Does your organisation have an information management strategy?

☐ Yes 11a. Is this strategy linked to other organisational strategies?

☐ Yes 11a.i How?

☐ No 11a.ii Why Not?

☐ No 11b. Do you consider that an information management strategy would be beneficial for your organisation?

☐ Yes 11b.i Why?

☐ No 11b.ii Why Not?

To what extent do you agree or disagree with the following statement?

12. My organisation's existing information technology systems support the achievement of the organisation's objectives.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Culture

To what extent do you agree or disagree with the following statements?

13. The culture of my organisation could be described as "knowledge friendly".

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

14. The culture of my organisation supports the sharing of knowledge.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

15. The culture of my organisation supports the sharing of information.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

16. My organisation motivates staff to share what they know.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

17. When introducing information technology system changes, has your organisation had to make any cultural changes or adjustments to support

this?

☐ Yes 17a. How have these been gone about?

17b. What has been the net effect?

☐ No 17c. Why not?

18. In your opinion, have there been any cultural barriers to implementing any system changes made?

☐ Yes 18a. What were they?

18b. How have they been addressed?

☐ No 18c.

To what extent do you agree or disagree with the following statements?

19. Our organisation's Chief Executive supports our knowledge management initiative

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

20. This has had an impact on the results of our knowledge management initiative

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Storing and Using Knowledge and Information

21. How is knowledge stored in your organisation?

☐ Paper Based ☐ Electronically Based ☐ Combination of Electronically and Paper Based

☐ Central Records Repository ☐ Decentralised Records Repository ☐ Library or Corporate Information Store

22. Is this knowledge used very much?

23. Does your organisation know what knowledge is critical to its success?

24. How do you ensure that the knowledge you capture is what the organisation needs?

25. How is information stored in your organisation?

- ☐ Paper Based
- ☐ Electronically Based
- ☐ Combination of Electronically and Paper Based
- ☐ Central Records Repository
- ☐ Decentralised Records Repository
- ☐ Library or Corporate Information Store

26. Is this information used very much?

27. Does your organisation know what information is critical to its success?

28. How do you ensure that the information you capture is what the organisation needs?

Knowledge Management Initiatives

29. What led to your organisation undertaking a knowledge management initiative? Any specific drivers?

30. What has been the timeframe for your knowledge management initiative?

31. How far advanced is your knowledge management initiative – is it at design, development, or implementation stages?

32. Which of the following knowledge management systems does your organisation use?

- a ☐ Intranet
- b ☐ Decision Support Systems
- c ☐ Knowledge Maps
- d ☐ Knowledge Webs
- e ☐ Kiosks
- f ☐ Extranet
- g ☐ Executive Information Systems
- h ☐ Knowledge Repositories
- i ☐ Electronic Yellow Pages
- j ☐ Other Knowledge Management Systems (specify)
- k ☐ Internet
- l ☐ Management Information Systems
- m ☐ Data Warehouse
- n ☐ Portals

33. To what extent are these integrated with your organisation's main

operating/workflow systems?

34. Who was involved with the design of your knowledge management system?

35. How have you gone about implementing your knowledge management system?

36. Did you buy an "off the shelf" product?

☐ Yes 36a. Why?

36b. What type of system have you bought?

☐ No 36c. Why not?

37. Have you used consultants or outside help on your knowledge management initiative?

☐ Yes 37a. Why?

☐ Yes 37a. Why?

38. Do you measure the amount of use your knowledge management systems get?

39. How do you ensure that knowledge captured in your knowledge management systems is kept up to date?

40. Who is responsible for maintaining the knowledge captured in your knowledge management system?

Concluding Questions

41. In your view, what have been the positive outcomes from the knowledge management initiative undertaken?

42. In your view, what have been the negative outcomes from the knowledge management initiative undertaken?

To what extent do you agree or disagree with the following statement?

43. My organisation values the knowledge management initiative it has undertaken.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

44. What, if anything, would you do differently if you were running the same exercise again?

45. Are there any other comments you'd like to make on your knowledge management initiative?

Appendix 2 – Introduction Letter

[Date]

[Name]

[Organisation]

[Address Line 1]

[Address Line 2]

Dear [Addressee]

DISCOVERING IF NEW ZEALAND STATE SECTOR ORGANISATIONS CAN BENEFIT OR DO BENEFIT FROM USING KNOWLEDGE MANAGEMENT

I am a Massey University student, enrolled in the Master of Business Information programme at the Wellington campus, and I am currently investigating the use of knowledge management initiatives within State sector organisations. My research is aimed at discovering what benefits these types of organisations can gain from applying knowledge management tools and techniques.

As part of my investigation into the use of knowledge management initiatives, I would like to talk to people in State sector organisations who are currently involved with implementing knowledge management systems. I am particularly interested in finding out about the knowledge management initiative being used in your organisation.

This would involve running interviews of less than an hour with appropriate people. The data obtained from these interviews will only be accessed by me and will only be used in conjunction with this project or with any publication that may arise out of it. The data will not be used for any other purposes.

I will call you shortly to discuss this and to obtain your agreement on holding interviews with appropriate people in your organisation. If you have any questions about this project or would like further information please don't hesitate to contact me by phone on [redacted]

Please note that this project has been reviewed, judged to be low risk, and approved by the researcher and supervisors under delegated authority from the Massey University Human Ethics Committee. If you have any concerns about the conduct of this research, please contact Professor Sylvia Rumball, Assistant to the Vice-Chancellor (Equity & Ethics), phone (06) 350-5249 or email humanethics@massey.ac.nz.

Yours faithfully

Lorraine Hamlin

Appendix 3 – Information Sheet

Discovering if New Zealand State Sector Organisations Can or Do Benefit from Using Knowledge Management

INFORMATION SHEET

Researcher Introduction

1. The researcher is Lorraine Hamlin, student in the Master of Business Information programme and the supervisors of this study are Dr Damian Ruth, Department of Management and Enterprise Development, College of Business and Dr Kevin Wilkinson, Department of Information Systems, College of Business.

2. Contact details for Lorraine Hamlin, Dr Damian Ruth and Dr Kevin Wilkinson are as follows:

	Telephone	**Email Address**
Lorraine Hamlin	[redacted]	[redacted]
Dr Damian Ruth	(04) 801-2794 ext 6782	D.W.Ruth@massey.ac.nz
Dr Kevin Wilkinson	(04) 801-2794 ext 6841	K.J.Wilkinson@massey.ac.nz

3. This project will take the form of a Master's Thesis, for the qualification of Master of Business Information. The main objective of this research project is:

   - To discover if New Zealand State sector organisations can benefit or do benefit from using knowledge management and knowledge management systems.

   To achieve this, the following steps will be taken:

   - Investigate different approaches to knowledge management and its implementation.
   - Investigate the use of knowledge management in a range of New Zealand State sector organisations.
   - Determine if New Zealand State sector organisations can learn from the implementation of knowledge management initiatives that have already been undertaken in the State sector.

4. The researcher, Lorraine Hamlin, is employed as a Manager at CG*NZ* Ltd.

Participant Recruitment

5. Participants for this study have been recruited from State sector organisations who have indicated in their Annual Reports and/or Statements of Intent that they are carrying out some type of knowledge management initiative.

6. A representative cross section of State sector organisations have been approached to take part in this study, to give a picture about the range of knowledge management activities currently occurring in the State sector.

Project Procedures

7. Data obtained from the project will only be used in conjunction with this project or with any publication that may arise out of the project. It will not be used for any other purposes.

8. Once data has been obtained, it will be analysed by the researcher, who will compare and contrast it with other data to diagnose key trends and findings. These findings and conclusions will then be incorporated into the Master's Thesis itself, which will be held by the researcher and Massey University.

9. Data obtained from interviews with project participants and audio tapes of interviews will be stored by the researcher in electronic- and paper-based forms, and will be held by the researcher for a period of five years. At the end of this time period the data and audio tapes will be forwarded to an appropriate member of the Massey University staff who will be responsible for its archival.

10. Audio tapes of interviews will be kept as a back-up tool to support data obtained from interviews. If any transcribing is necessary, only the researcher will perform this.

11. It should be noted that information collected will be aggregated for the sake of discussing trends.

12. The names of project participants who have taken part in interviews and the names of the organisations they representative will not be disclosed in the project findings included in the Master's Thesis itself, or any publications emanating from this work, unless participants involved with the project agree that these may be disclosed.

13. Interview participants will be circulated with a summary of the project's findings at the completion of the project.

Participant Involvement

14. Participants involved with the project will be interviewed by the researcher, which will involve participants answering a number of questions.

15. Initial interviews with each participant will be scheduled to take less than an hour. If it becomes necessary to conduct follow-up interviews for clarification, these will be kept as brief as possible.

Participant's Rights

16. As a study participant, you have the right to:

- Decline to answer any particular questions.
- Withdraw from the study at any time.
- Ask any questions about the study at any time during participation.
- Provide information on the understanding that your name will not be used unless you give permission to the researcher.
- Access a summary of the findings of the study when it is concluded.
- You also have the right to ask for the audio tape to be turned off at any time during the interview.

Project Contacts

17. You are invited to contact the researcher and/or the project supervisors given above if you have any questions about the project.

Committee Approval Statement

18. This project has been reviewed, judged to be low risk, and approved by the researcher and supervisors under delegated authority from the Massey University Human Ethics Committee. If you have any concerns about the conduct of this research, please contact Professor Sylvia Rumball, Assistant to the Vice-Chancellor (Equity & Ethics), phone (06) 350-5249 or email humanethics@massey.ac.nz.

Appendix 4 – Consent Form

Discovering if New Zealand State Sector Organisations Can or Do Benefit from Using Knowledge Management

CONSENT FORM

THIS CONSENT FORM WILL BE HELD FOR A PERIOD OF FIVE (5) YEARS

I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I agree to participate in this study under the conditions set out in the Information Sheet.

I agree/do not agree to the interview being audio taped.

Please note that this project has been reviewed, judged to be low risk, and approved by the researcher and supervisors under delegated authority from the Massey University Human Ethics Committee. If you have any concerns about the conduct of this research, please contact Professor Sylvia Rumball, Assistant to the Vice-Chancellor (Equity & Ethics), phone (06) 350-5249 or email humanethics@massey.ac.nz.

Signature: **Date:**

Full Name –
(print)

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GLOSSARY OF TERMS USED

Term	Working Definition or Definition Used
Accountability documents	Public sector documents used for planning and reporting, including a Statement of Intent and an Annual Report, which are publicly available and tabled in Parliament each year.
Close-ended questions	Questions where the interviewee is asked to respond against a group of pre-determined answers eg: yes, no or not applicable.
Codified knowledge	Knowledge that has been documented, structured and disseminated.
Data	Objective facts or records about an event.
Explicit knowledge	Knowledge that has been captured, articulated and codified.
Epistemology	The philosophy of knowledge and the human understanding of knowledge.
In-depth interviews	Face-to-face exchanges between the interviewer and interviewees based on gathering understanding about the interviewees' experiences, opinions and perspectives.
Information	Data which has relevance, purpose and context added to it.
Interview	A face-to-face exchange where an interviewer attempts to gain information, insight and opinions from interviewees.
Interview guide/questionnaire	A list of general issues, topics, questions and problems to be covered in each interview.
Knowledge	Information that has been blended with experience,

Term	Working Definition or Definition Used
	understanding, awareness, context, purpose and expertise that enables someone to take action.
Knowledge management initiative	The knowledge management work or project that is being undertaken or has been undertaken in an organisation.
Knowledge map	The visual display of captured knowledge and information in an organisation, along with organisational relationships, which enables knowledge to be acquired and transferred.
Knowledge repository	Knowledge repositories are used to store and disseminate knowledge and information in a variety of formats.
Open-ended questions	Questions which do not have pre-determined answers for the interviewee to choose from, interviewees can make any response they see as fitting.
Organisational objectives	The organisation's stated strategic direction, which may include its mission or vision or strategies and strategic goals.
Tacit knowledge	Knowledge that resides in people's minds, which is uncodified and intangible.