Theorising information use: managers and their work

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Certificate of authorship and originality

I certify that the work in this thesis had not previously been submitted for a degree nor has it been submitted as part of the requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

Signed

Date

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Abstract

The focus of this thesis is information use. Although a key concept in information behaviour, information use has received little attention from information science researchers. Studies of other key concepts such as information need and information seeking are dominant in information behaviour research. Information use is an area of interest to information professionals who rely on research outcomes to shape their practice. There are few empirical studies of how people actually use information that might guide and refine the development of information systems, products and services.

The thesis begins to address this imbalance in information behaviour research by exploring the concept of information use through an empirical study. Fifteen senior managers from two organisations in the cultural industries sector participated in the study. Analysis of interviews revealed that the managers understood and experienced information use in five different ways: as information packaging; as information flow; as developing new knowledge and insights; as shaping judgements and decisions; and as influencing others. These five different ways of experiencing information use are related in a hierarchy that reflects three different views of information: as an object; as a construct; and as a transformative force. Embedded in the hierarchy are different relations between people and information in their work environments, different processes of information use and different criteria for determining the quality of information that is used.

The thesis demonstrates that the concept of information use can be explored empirically using phenomenography as the research approach. This approach, which originated in the field of education, has been used infrequently in information behaviour research. It offers potential for the further exploration of not only information use but also other concepts germane to information behaviour. The thesis highlights the richness of peoples' experiences of information use and points to some directions that might be taken by practitioners in developing information systems, products and services to support people as they 'go about their business'.

Chapter 1

Introduction to the thesis

Reminders that we live in the Information Age are ever present and pervasive. Government policies regulate universal access to information and the broadcasting of it. Cultural institutions are responsible for the interpretation of cultural artefacts and making them accessible to communities. Education institutions from preschools to universities promote approaches to learning that foster informed decision making. Social and community groups rely on effective dissemination of information to further their goals. Firms and organisations value information as a key asset contributing to their sustainability in competitive environments. Tools and technologies are available for the efficient collection, storage and transmission of information. Information can have a profound effect on political, economic and social structures locally, nationally and globally. It can also affect the lives of people as they engage in their family, social and work activities.

But the benefits that are promised in the name of information are not always realised by nations, societies and people. The 'digital divide', a shorthand term for describing different levels of access to information and the technologies and tools that make it available to people, is offered as an explanation for some of the inequities in information access that exist at global and international levels as well as within nations and societies. Different levels of general education and literacy, as well as the domination of English as the language of the Internet, present challenges to reaping the benefits of information. Some of the information systems, services and products intended to provide access to information do not always provide clear pathways to the information they hold. The structures of firms and organisations sometimes inhibit the sharing of information that has the potential to ensure sustainability and growth. People are not always able to turn to their advantage the information that is available to them in the course of their daily lives.

Information science, concerned broadly with the 'characteristics of information and the nature of the information transfer process' (Bottle 1997: 212), is one of the key disciplines in resolving some of the dilemmas of the Information Age, especially those revolving around the interactions among people and information. These interactions are central to the field of information behaviour and to the development of theory grounded in information seeking and use studies. They are also of interest in information practice and particularly in the design and development of information systems, services and products based on those interactions. Information science researchers and information practitioners share an interest in understanding people-centred views on these interactions so that the benefits of information to people can be realised. Capturing these views has presented a significant challenge to information science researchers. Almost twenty years ago, Dervin (1983: 173) suggested that 'people are in charge of how they use the information they attend to' and only recently Julien (1999: 209) felt the need to remind researchers that they must 'allow in a theoretical sense…for people's self-construction of meaning and behavior'.

Origins of the thesis

It is against this background that two major themes presented themselves and shaped the thesis. The first major theme forms the central focus of the thesis, information use. The information transfer process as it involves people implies personal motivation and capabilities for exchanging information as well as opportunities for engaging in information transfer. It also assumes the process character of information behaviour and the extent to which information needs, seeking and use are embedded in the environments and contexts in which people and information interact (Vakkari *et al.* 1997; Dervin 1997: 8). There is then an imperative to bring a people-centred view to the study of interactions among people and information and by doing so to contribute to a fuller understanding of information behaviour. This imperative is consistent with a recent depiction of the changing emphasis in information science from:

> …wondering why people use or do not use information institutions, systems or sources towards considering what information is to people, how *stuff* ends up becoming information and how information so discovered influences further action (Solomon 2002: 229-230).

This more recent emphasis on discovering information involves ‘engagement, reflection, learning, and action’ (Solomon 2002: 229).

The second major theme is related to the challenges presented to information science researchers by a people-centred view of the interactions among people and information. Such a view requires the study of information use to focus on how people actually use information in their daily lives. These challenges are met in the first instance by the selection of an appropriate research approach and methodology aligned with qualitative traditions of inquiry (Lincoln and Guba 1985; Cresswell 1998; Denzin and Lincoln 2000) and in the second instance by the quality of the design and implementation of research projects and the development of research programs.

Rationale for the thesis

The theoretical justification for the thesis derives from its location in the discipline of information science. With its central focus on the concept of information use it addresses a significant gap in the study of information behaviour. The stance it adopts towards the interactions among people and information is that people are actors rather than observers (Byström 1999). In addition, the fields of organisation theory and management illuminate the environment and context in which information use is explored in the empirical study that informs the thesis.

The thesis addresses two requirements of information science research, the first related to the definition of the field and the second to its scope. Bates (1999: 1048) asserts that the intellectual domain of information science is the universe of the documentary products of human activity – and ‘how human beings produce it, seek it, retrieve it and use it’. She argues that because the field's interest is in information produced by human agency then how human beings relate to this information is of central importance in research. The thesis seeks to clarify the relation between people and information through its exploration of information use and further define the 'parameters and variables associated with our universe' (Bates 1999:1048). The empirical study on which the thesis is based explores how people use the documentary products of human activity within the parameters of organisations and particular work roles.

Two decades ago Wilson (1981: 5) described information use as 'one of the most neglected areas' of study in information behaviour. He went on to observe that information exchange as understood in the field of information behaviour fell more within the interests of sociologists and organisational theorists than information scientists (Wilson 1981: 4-5). In a more recent review of the literatures of personality studies in psychology, consumer behaviour, innovation research, health communication, organisational decision making and information systems design, Wilson (1997: 567) again commented on research into information use and concluded that it was concerned more with 'factors that create the need for information and the factors that affect the choice on information sources and channels' than with how information is actually used. Information use was regarded as being 'non-problematical' outside the discipline of information science as well as within it (Wilson 1997: 567).

Other information science researchers have also drawn attention to the lack of research into information use. Kuhlthau (1993: 353) suggested that questions about the use that is actually made of information and its relation to information need represented a promising area of research. Matarazzo (1994: 7) commented on 'an extraordinary lack of knowledge and information surrounding information use'. The one exception that he located was Marshall's (1993) study of the impact of corporate libraries on decision making in organisations.

It seems that little has changed since Wilson's initial observation. In summing up the first Information Seeking in Context Conference, Vakkari (1997: 460) concluded that most of the studies that were reported 'concentrated heavily on information needs and seeking of individuals leaving information use and organizational or societal factors aside'. However, he also observed that although 'research has explored information seeking as an endpoint' there were some signs that information behaviour was being stretched to include information use in some of the studies that drew on Dervin's sense making methodology, adopted a cognitive viewpoint or focussed on the utilisation of information in work groups (Vakkari 1997: 461).

Not only are there few studies of people's actual use of information but there is also an identifiable lack of theory development. While this lack has been characteristic of library and information science more generally, a situation lamented by Maguire (1989) over a decade ago, it is also characteristic of information behaviour research. There is though some evidence that this situation is changing as the field of information behaviour research matures (Vakkari 1997: 458). Although most of the theories used in information behaviour research are drawn from the social sciences and those that have been developed have not yet had much impact outside the field of information behaviour, substantive theoretical work is now being undertaken in the field (McKechnie *et al.* 2001). Furthermore, the emerging body of work is characterised by a people-centred core and an emphasis on the 'contextual interplay of cognitive, social, cultural, organizational, affective and linguistic factors' that place the phenomena of information behaviour in communicative processes (Pettigrew et al. 2001: 67).

In the organisational theory and management literatures there is an increasing emphasis on the study of information and its management. The recent emergence of knowledge management as a strategy for enhancing organisational performance has drawn attention to the value of information and shifted the focus from the use of information and communication technologies as the keys to organisational performance. Drucker (1988) was one of the early scholars who foreshadowed the positive impact of information and knowledge work on organisations and proposed organisational structures and forms appropriate to information-based organisations. He argued convincingly that information contributes to increased productivity, the development of new products and services and the expansion of market share, as well as positive and timely responses to the external environment and productive changes to the cultures of organisations. Increasingly, the imperatives for innovation and creativity are encouraging organisations to consider the processes, techniques and tools for managing their information resources, facilitating information exchange and creating knowledge (Broadbent 1997; Hansen *et al.* 1999; Davenport and Cronin 2000; Alvesson and Kärreman 2001). Organisational learning, social capital and communities of practice are emerging as areas of interest to information scientists as well as to organisational theorists and managers (Davenport and Hall 2002).

Aims of the study

The study that underpins the thesis arises from gaps in the literature in information behaviour and in particular the theoretical and empirical literature in information use. The study drew on the organisational theory and management literatures as they relate to information and information use in organisations. It aimed to describe people's experiences of information use in the environment of organisations. The context for information use was determined by the work roles of people in the study, that is senior managers.

With this aim in mind research questions were developed to shape the conceptual and methodological frameworks of the study. These questions were:

i. What are the different ways in which managers understand and experience information use?
ii. Is there a methodology appropriate to a people-centred view of information use?

Significance of the study

The study is significant for several reasons, some of which are related to the field of information behaviour and the methodological development that it provides, others to information use in organisational environments and work roles and yet others related to information practice. Because it is concerned with revealing the actual use of information by people in an information intensive setting the study offers a unique perspective on the phenomenon that is central to the study. Most studies of information use are limited to the use of information sources and information channels. With its focus on information and how it is used the study represents a departure from studies of the use of information sources and information channels. The complexity of information use that the study reveals should enrich information behaviour theory and research and serve to demonstrate that information science is capable of generating its own theoretical models when necessary.

Methodologically the study continues the trend towards interpretive approaches in people-centred research in information behaviour. The phenomenographic approach around which the study was designed is more commonly associated with research in education. It meets the challenge of researching a phenomenon that is often invisible and beyond the reach of direct observation and so it has potential for empirical studies in areas of information science beyond information use. Integral to the approach is the interpretation of people's experiences of a phenomenon and the discovery of variation in people's descriptions of their experiences. Phenomenography has been used in a few studies in information science most of them of information literacy. It is expected that the study will be of general interest to phenomenographers as well as information science researchers.

Some guidelines and strategies for exploiting information more effectively in organisations emerge from the study. Some of these are directed towards the development of an information culture that fosters conversation and the exchange of information, others are more focussed on the presentation of information so that it catches the attention of those who need it and yet others provide some directions for enhancing people's information handling capabilities. Some of the outcomes of the study have the potential to assist organisations integrate information and knowledge creation into business processes.

Finally the outcomes of the study are significant for information practice not only within organisations but also more generally in the development of information services, products and systems. By exploring information use from the perspective of those who actually use information the study reaffirms the location of people at the core of information services. There are implications that arise from the study for the principles that might be followed by designers of information services, products and systems and for the roles of information practitioners as mediators between people and information. There are also implications for the education of information practitioners, especially in regard to enhancing people's information capabilities and providing a voice to the users of the information services, products and systems.

Terminology

There are instances where terms used in information science and phenomenography are explained and discussed in relevant sections of the thesis. These terms are also included in the Glossary that forms Appendix 1. Australian literary conventions are used except in direct quotations where the spelling and idiom of the original writers and speakers are used.

Overview of the thesis

This first Chapter provides an introduction to the thesis and to the study of information use. Chapters 2 and 3 locate the thesis theoretically and methodologically. Chapter 2 places the thesis in the field of information behaviour and explores the central concepts of information and information use. Chapter 3 locates the thesis among interpretive research methodologies and addresses the challenges of studying information use. Chapters 4 and 5 describe the conceptual and methodological frameworks of the empirical study respectively. Chapter 4 draws on the literatures of information science, organisational theory and management. Chapter 5 describes the design of the study and the processes used for gathering and analysing experiential accounts of information use. Chapter 6 presents the analysis of those accounts in the forms appropriate to a phenomenographic study. Chapter 7 concludes the thesis with a discussion of the outcomes of the study in relation to the research questions, the empirical study's conceptual and methodological frameworks and the broader theoretical and methodological locations of the thesis. Implications for information science research and information practice are presented.

Chapter 2

Theoretical location of the thesis

There are two reasons for considering the theoretical location of the thesis separately from the conceptual framework of the study that supports it. The first reason is related to the current state of information behaviour research. Although there are some gaps and weaknesses in theory development in information behaviour, the thesis needs to be guided by the theory that does exist if it is to contribute to theory development in the field. The second reason is related to the demands on the researcher to develop sensitivity towards the subtleties of meaning in the data gathered and analysed in the empirical study. Although this sensitivity is developed through the research process itself, the researcher needs to be oriented towards the concept that is being explored. Different perspectives on information use need to be understood and any tensions among them need to be acknowledged by the researcher.

This Chapter bases the discussion of the theoretical location of the thesis on four topics:

- perspectives on information
- perspectives on information use
- typologies of information use
- factors that facilitate information use.

The Chapter concludes with a brief summary of the theoretical underpinnings of the thesis.

Perspectives on information

There are several different perspectives on information that are pertinent to the thesis, primarily because they highlight the definitional ambiguity surrounding one of the fundamental concepts in information science that has bedevilled information science scholars for a long time (for example Wersig and Neveling 1975). It has been estimated that there are more than 400 definitions presented by researchers from different fields of this 'elusive and controversial concept' (Yuexiao 1988: 479-480). The discussion of these perspectives on information is offered in the spirit of accepting as wide a range of views as possible rather than attempting to prescribe particular meanings. Rowley (1998: 252) speculates that the concept will be defined by the 'systems, practices and cases which feature information' and that it will change as the time, context and culture in which it is embedded varies. Rather than despair at the untidiness that multiple definitions might represent, Rowley (1998) urges acknowledgement of the rich diversity of perspectives on information. On the contrary, Losee (1997: 267-268) argues for the development of a hierarchical model of information that is independent of any one discipline in the interests of providing some precision in interdisciplinary discussions of information and Meadow and Yuan (1997) propose the development of some standard usages of key terms such as 'data', 'information' and 'knowledge'.

The thesis is intended to explain people's understanding of the concepts of information and information use and so it is appropriate that it avoids the risk of 'sinking in the shifting sands of the meaning of information' (Bawden 2001: 98). The thesis must recognise though that not only are there different perspectives on information that appear confusing but also that the confusion is compounded when considering the concept of information use. For example, Savolainen (2000) refers to the difficulties in distinguishing between the concepts of information and knowledge and clarifying the concept of information use when in everyday experience 'using something' is implied. Todd (1999a: 852) has outlined the ways in which the terms 'information use', 'knowledge use', 'information utilisation' and 'knowledge utilisation' are interchanged in the field of information utilisation, a field designated recently by one of its scholars as knowledge/information utilisation (Oh 1997: 4).

The perspectives on information that have been selected for closer examination have different starting points: common usage of the term 'information' as it applies to individuals, considerations of information used in policy making, and information as it is conceived in different world views in information science. Each of these perspectives will be discussed and then compared as a way of illustrating the potential complexity of information.

Information in everyday usage

Information scientists who have drawn on everyday language usage as a basis for clarifying the meaning of information include Debons *et al* (1988), Buckland (1991) and Mason *et al* (1995). Debons *et al* (1988: 7-9) and Mason *et al* (1995: 51-55) describe a hierarchical information continuum that begins with an event or a change in the state of the world represented by symbols that are in turn organised to generate data. In becoming aware of data about the event a person has acquired information. When meaning or understanding is applied to that awareness and information has been validated or authenticated then knowledge is created. Wisdom is knowledge that is integrated with values, ethics and cultural or social norms. The distinctions among data, information and knowledge in particular have been significant in the development of systems for information retrieval (for example Taylor 1986; Gödert 1996; Ingwersen 1999).

A different perspective based on everyday uses of the term 'information' is offered by Buckland (1991). Using definitions in the Oxford English Dictionary, Buckland identifies three different uses of the term. These are information-as-process or 'the act of informing', information-as-knowledge or 'that which is perceived in information-as-process' and information-as-thing or 'objects…regarded as being informative' (Buckland 1991; 351). Buckland suggests that information-as-thing or the capability of being informative should be broadly conceived to include data, documents, objects and events. It follows that information-as-thing is situational and so too is information-as-process. Information-as-knowledge is intangible and needs to be expressed or represented in some way as information-as-thing in order to be communicated. It should be acknowledged that some information science scholars, for example Savolainen (2000,) find Buckland's terms confusing but in recognising that information is largely situational this perspective implies some relation between people and information while at the same time suggesting that information-as-process relies only partly on cognitive processing.

Information in policy making

From a policy-making perspective the view of information moves beyond the individual and the processes of transforming information into knowledge to considerations of information in a social, political and cultural context. Based on an analysis of definitions used in different disciplines, Braman (1989) offers a hierarchy of definitions that is based on the scope of social phenomena and the complexity of social organisation involved. Information is seen as a resource, a commodity, the perception of a pattern and a constitutive force in society.

As a resource, information is viewed independently of 'its creators, processors and users' and it comes 'in pieces unrelated to bodies of knowledge or information flows into which is might be organised' (Braman 1989: 236). This is the view of information that is commonly associated with notions of the information 'haves and have-nots'. As a commodity, information assumes an economic value as it passes through a production chain that enables its exchange and use among people (Braman 1989: 238). As the perception of a pattern, information has a context. It has 'a past and a future, is affected by motive and other environmental and causal factors, and itself has effects' (Braman 1989: 238). Information can be viewed in ongoing processes and it can be granted a power of its own. Information as a constitutive force in society has an 'active role in shaping context' (Braman 1989: 239). At this highest level in the hierarchy of definitions information, its flows and its use have a powerful role in constructing social reality.

The notions of information as a resource and as a commodity have been treated with some caution by information science researchers although they were embraced by the practitioners who pioneered information resource management particularly in government and the public sector in the United States (Horton and Marchand 1982; Horton 1987). While the suggestions that information is a resource and a commodity has been challenged by Cronin (1984), Vickers (1985), Best (1988) and Olaisen (1990) perhaps the real issue is the risk of the tangible elements of information being privileged over 'the informal, anomalous, multifacetted, interdisciplinary, idiosyncratic, individualistic aspects of information transfer associated with creativity and innovation' (Eaton and Bawden 1991: 165).

Information in world views in information science

The final perspective on information draws on a distinction made by Dervin and Nilan (1986) just over twenty-five years ago in an overview of the literature on information behaviour. Although contentious when it was first published their analysis of the traditional and alternate paradigms in information science is well accepted, so much so that it is being elaborated as more research outcomes are published. Central to the two paradigms are different views on information. In the traditional paradigm information is seen as an object rather like a brick whereas in the alternate paradigm information is regarded as subjective or as a user construct. Dervin and Nilan attribute the predominance of the traditional view of information at the time of their writing to more of a concern with information systems than with the people using information. In recent years this predominance has been balanced by a greater concern with the interactions between information systems and people.

The alternate paradigm has been elaborated recently by Bruce's (1997a) study of information literacy in which she identified different ways in which information was understood. In addition to the objective and subjective views on information noted by Dervin and Nilan, Bruce added a third, transformational. The transformational nature of information allows what a person knows to be extended through new insights or used for the benefit of others (Bruce 1997a: 115-116). Whether this additional view on information constitutes a fundamental change in the accepted views on information, at least among information science scholars, is yet to be established. Bruce (1999a: 39) has proposed that the interpretive paradigm that has emerged from empirical studies is categorically different to the alternate paradigm proposed by Dervin and Nilan (1986) but because both paradigms share similar ontological and epistemological assumptions Bruce's view is treated in this thesis as an extension of Dervin and Nilan's alternate paradigm. Bruce's identification of the transformational view of information does signal that a more subtle approach to the conceptualisation of information is warranted.

It is clear from this examination of the different perspectives on information that there is no one word capable of signifying the multiple meanings attached to the term 'information'. It is possible to represent the range of meanings by placing the words used in these perspectives on a continuum. This continuum is shown in Figure 1 below.

Figure 1

Continuum of information terms

Individual oriented		Objective information Information-as-thing		Subjective information Information-as-process		Information as transformational Information-as-knowledge	
	Data		Information		Knowledge		Wisdom
Group oriented	Information as a resource		Information as a commodity		Information as perceptions of a pattern		Information as constitutive force

[1]This figure is based on the work of Braman (1989), Buckland (1991), Bruce (1997a), Dervin and Nilan (1986), Debons *et al* (1988) and Mason *et al* (1995).

Perspectives on information use

In light of the overview of perspectives on information it is to be expected that there are also different perspectives on what constitutes information use. It must be acknowledged though that there are some difficulties in describing information use. One difficulty arises in relation to the notion of 'use' simply because people 'are so deeply embedded in the ubiquitous processes of use that it seems to be almost impossible to step outside the magic circle and to reflect on 'use' analytically' (Savolainen 2000: 36). Another difficulty concerns the distinction between information use and the purposes a person might have in using information. Menou (1995a: 467) asserts that 'people do not use information, they just go about their business'.

Yet another difficulty lies in different meanings that might be attributed to the term 'information use'. In making the point that the meanings of information use are largely context dependent, Taylor (1986: 10-11) provides the following examples: choosing a bibliographic reference to a document, receiving an answer to a question or clarifying a problem situation, inserting 'a chunk of information' into a document or input into a decision, and even the messages that form new information and knowledge in an educating process.

It is possible to clarify the concept of information use by outlining two different perspectives on information use. One of these is drawn from the information science literature and is directed towards people's information use in their everyday lives. The other perspective is drawn from the information utilisation literature and is concerned more with the use of research information by government officials in the policy making process.

A perspective from information science

Two related perspectives on information use from information science are presented. The first is a more theoretical one and applies the earlier discussion of world views in information science to the concept of information use. It contrasts the questions that are raised about what might constitute information use in each world view. The second perspective is a behavioural one that has emerged from empirical studies of information behaviour.

A leading theorist in information science and communication, Dervin (1992: 63-65), presents an analysis of the study of information use based on the two different approaches to information that lie at the core of the traditional and alternative paradigms in information science. The proposition that 'information has an existence apart from human construction' (Dervin 1992: 64) and exists independently of human behavioural activity leads to the conceptualisation of information use as the transmission of information. This conceptualisation calls to mind Shannon and Weaver's (1949) model of the communication of information from a sender to a receiver, a model that was influential in the early development of information systems.

Questions that might be asked about information use might then include: how much information did someone receive? where did it come from? was it accurate? This proposition also suggests information use can be observed and that it centres on states and entities. Further questions that might be asked include: what particular information systems or sources are used by particular groups of people, for example lawyers, managers, health professionals? what are the demographic characteristics of people who use particular information sources or systems? what information channels and media are preferred by particular groups of people, for example humanities scholars and scientists?

By contrast, the proposition that information is 'the sense created at a specific moment in time-space by one or more individuals' (Dervin 1992: 63) leads to a different set of questions that might be asked about information use. These questions are concerned with the construction of information by people rather than with its transmission. They might include: what information did the person use to move forward? what strategies did the person use to determine that the information was appropriate for the purpose? The questions asked are also based on the assumption that information use can be seen and understood only from the perspective of the information user. They might include: what would make this information more accessible to you? what might make this information more convenient for you to use? Implicit in the proposition that information is a user construct is the assumption that information use is a process rather than a state or an entity. Further questions that might be asked are: what are some of the internal and external behaviours that people use in constructing their sense of the world? what are the aspects of people's situations that led them to use information at a particular moment? what are some of the discernible patterns in people's information use when they are unable to make sense of their worlds?

Information use can also be viewed as an aspect of information behaviour. Wilson sees information use as one of two subsets of information behaviour, the other being information seeking. He defines information behaviour as:

> …the totality of human behavior in relation to sources and channels of information, including both active and passive information seeking, and use. Thus, it includes face-to-face communication with others, as well as the passive reception of information as in, for example, watching TV advertisements, without any intention to act on the information given (Wilson 2000a: 49).

This definition implies that information sources and channels are more relevant to information seeking behaviour and that it is the information delivered from those sources and channels that is more relevant to information use. Wilson defines information use behaviour as:

> …the physical and mental acts involved in incorporating the information found into the person's existing knowledge base. It may involve, therefore, physical acts such as marking

> sections in a text to note their importance or significance, as well as mental acts that involve, for example, comparison of new information with existing knowledge (Wilson 2000a: 50).

Information use is essentially a cognitive activity although it might be accompanied by observable actions related to that activity. Alluding to the information continuum, Wilson makes the point that his definition subsumes data under information but not information under knowledge on the grounds that knowledge is known only to a knower. For this reason information remains at best an incomplete surrogate of knowledge (Wilson 2000a: 50).

Although Wilson's focus in this particular definition of information use behaviour is on physical and mental acts he does not overlook an affective dimension to information use. This is suggested not only by the definition of information behaviour that Wilson provides but also by his earlier work. In his original model that has been so influential, Wilson (1981) admitted affective and social dimensions to information behaviour and his later revision of this model maintained these dimensions (Wilson 1997). Indeed Wilson is one the few researchers, along with MacMullin and Taylor (1984) and Kuhlthau (1993b,) who has acknowledged the totality of behaviours in information needs, seeking and use.

A perspective from information utilisation

Information utilisation is distinguished from information acquisition and information dissemination in a way that resonates with the different information behaviours identified by Wilson (2000a). A distinction is also made between information use and information utilisation. For example, Rich (1997) defines several terms noting that there is no commonly agreed understanding of 'use':

> …use is different from acquiring information and from disseminating it. Dissemination simply means that some channel of transmission has been used to send data or information from one source to one or more other sources…'use' may simply mean that information has been received and read; it does not necessarily imply that information has been understood; it also does [not] imply that some action has been taken…'utility'…represents some user's

> judgement that information could be relevant or of value for some purpose which has not been identified as of yet (Rich 1997: 15).

Reflecting to some extent the distinction between information as an object and as a user construct, information utilisation can be regarded as an outcome and as a process. If information utilisation is regarded as an outcome then there is a need to attribute that outcome to the use of some discrete and identifiable set of information (Larsen 1980). Such attribution need not necessarily be causal but there does need to be evidence of information contributing to, or influencing, the reaching of an objective or an outcome. Rich (1997: 13) suggests that influencing an outcome might include influencing a decision maker's thinking about an issue or a problem. Some examples of outcomes associated with information utilisation might include developing a strategy, informing the public about an issue, developing a marketing campaign and sensitising service providers to the needs of clients (Rich 1997: 13).

In writing about information utilisation as a process Rich (1997: 15) echoes the work of writers such as Weiss (1980) who described information utilisation as a series of less than discrete events and likened it to 'knowledge creep'. Rich emphasises that information utilisation is not a 'single discrete event at one point in time' but that it extends over a period of time (Rich 1997: 20). Further, the information utilisation process involves three generic steps that can occur at the levels of an individual, an organisation, a network of multiple individuals and organisations. These steps are:

1. Information pick-up in which information is retrieved and received
2. Information processing in which information is understood, tested for validity and reliability, often against the user's intuition and assumptions and transformed into a form that is usable
3. Information application in which a decision is made about whether or not to use the information that has been received and processed (based on Rich 1991, Rich 1997: 20-21).

Rich recognises the importance of the context in which information utilisation occurs and suggests that a salient question concerns the end towards which the process is oriented.

That end might be toward some kind of instrumental change, future planning, designing services for clients and users or facilitating effective problem solving. The question challenges the deterministic and rationalistic input/output approach that has dominated information utilisation research. Indeed Wingens (1990: 37) called for a shift of focus towards the 'active-creative role of the user for the process of use', a role that has been accorded to information users in Dervin and Nilan's (1986) alternate paradigm. More recently, Oh (1997) has made a similar call to his colleagues in the information utilisation research community.

There are then some common threads in the information science and information utilisation literatures regarding information use. The ways in which information is conceptualised has some influence on perspectives on information use. These threads have been drawn together in a discussion of the literature by Todd (1999a; Todd 1999b) who argued that there are two approaches to information use/utilisation: as an end-state characterised by certain behaviours and as a more holistic process of change brought about by interactions between people and information. Although these two perspectives have a basis in the theoretical literature it is not clear that they are they are recognised necessarily by the people who use information in their daily living and for whom information sources, services and systems are designed and developed.

A contentious issue is whether the concept of information use includes the effects or consequences of information use. The issue raises a fundamental question about the nature of information. Implicit in people's information use, regardless of the perspective that is adopted, is the notion that people and information 'come together' in some way and that people 'do' something with information. There is some disagreement about whether this coming together of people and information and their doing something with information should be kept separate from the effects of the coming together and the doing. Machlup (1979: 63-64) suggests that the use of information means 'to listen, to look at, to read; in short it is its reception and, if possible, its full or partial understanding by the recipient'.

He draws a line between the knowledge that is developed from that understanding and using that knowledge, in other words keeping the use of information and the effect of that use separate. Resonating with Machlup's position is the information continuum with its distinction between information and knowledge and its view of information as an object. On the other hand, Taylor (1991: 221) describes the uses of information as 'what information does to or for the recipient *and for his or her problem or situation*' suggesting that not only is information a user construct but also that effects are included in the process of information use.

It is necessary to distinguish between types of information and types of information use but this task is not as straightforward as it might seem. Rich (1997) takes Machlup's classification of knowledge as an example of types of knowledge and elaborates each of the five major classes: practical knowledge, intellectual knowledge, small talk or pastime knowledge, spiritual knowledge and unwanted knowledge. He explains that for Machlup both information and knowledge provide added value to the person who uses but the difference is that knowledge, unlike information, has been subjected to some validation or 'truth' test (Rich 1997: 14). It is difficult to appreciate the attribution of value to either information or knowledge without considering how it might be used at any particular time. Machlup (1980: 107) claims that:

> ...an objective interpretation according to *what* is known is less satisfactory than a subjective interpretation according to the meaning which the knower attaches to the known, that is *who* knows and *why* and *what for*'.

These five classes of knowledge then are as much categories of information and knowledge use, to use Machlup's terminology, as they are types of information and knowledge.

Typologies of information use

There are several typologies that depict different modes of information use and reinforce the perspectives on information as an object and a user construct and on information use as and end state and a process. The five typologies that are presented here illustrate the richness and complexity of information use. The typologies are arranged in order of initial publication and attributed to the areas in which they were developed: social science information use, research utilisation, sense making, a cognitive process and information seeking and use.

Social science information use

Pelz (1978) identified three different modes of information use in his analysis of the use of social science research in the development of public policy: instrumental, conceptual and symbolic use. These are described as:

i. instrumental use. This is 'knowledge for action' (Rich as cited in Pelz 1978: 349) and deals with a 'specific decision or action that can be clearly designated' to the use of information (Pelz 1978: 349). Instrumental use relies on a simple linear input/output model of information use and assumes that information produces only a single effect. These are acknowledged as possible shortcomings of this mode of information use.

ii. conceptual use. This is 'knowledge for understanding' and refers to 'a policymaker's thinking about an issue without putting information to any specific, documentable use' (Rich as cited in Pelz 1978: 349). This mode of use is regarded as equivalent to an enlightenment function and it sometimes takes account of information that 'challenges accepted ideas, arrangements and programs' (Weiss and Bucuvalas as cited in Pelz 1978: 350). The information that is used might also reinforce a decision maker's thinking or judgement.

iii. symbolic use. Also referred to as a legitimative use, symbolic use includes the use of information as a substitute for a decision, to delay a decision or to legitimate a decision that has been made or a position taken (based on Knorr as cited in Pelz 1978, 351). Information might also be used by a decision maker to justify his or her position to others. In some instances the content of the information is not as important as the fact that there is information available. Of all three modes of use it is symbolic use that is surrounded by more ethical issues particularly in relation to the distortion of information.

Pelz makes the point that the demarcations between these modes of use are not sharp. He suggests that in policymaking symbolic use is perhaps the most prevalent, followed by conceptual use and then instrumental use (Pelz 1978: 352). At least two of these modes have been shown to have a unique focus. A study of the use of evidence by personnel in school districts concluded that the central feature of the instrumental mode is the decision whereas the central feature of the conceptual mode is the 'human information processor' (Kennedy 1984: 207). Although the symbolic mode itself was beyond the scope of this particular study it is possible that its unique feature is related to the reception or acceptance of a position or a decision by others.

The utilisation of research

This typology of information use is also based on an analysis of the ways in which social science research is used in public policy and it acknowledges that research utilisation is 'an extraordinarily complex phenomenon' (Weiss 1979: 427). It proposed seven different models of what can be regarded as information use.

i. knowledge-driven model. Derived from the natural sciences this model is based on an assumption that 'the sheer fact that knowledge exists presses it toward development and use' (Weiss 1979: 427). There are few examples of this model in the social sciences possibly because social science information is neither sufficiently compelling nor authoritative to drive inevitably towards its implementation (Weiss 1979: 427).

ii. problem-solving model. Like the knowledge-driven model, this model is linear but it is derived from the social sciences. A problem exists and research information either generates a solution or is used to identify an appropriate solution from a number of alternatives. This model assumes the inevitable use of research findings in policy decisions as well as agreement about the nature of the problem and the goal to be reached. Although this model was the prevailing image of research utilisation it was found to apply to few instances of policy development (Weiss 1979: 427-428).

iii. interactive model. In contrast to the linear sequence of research to decision, the interactive model is 'a disorderly set of interconnections and back-and-forthness that defies neat diagrams' (Weiss 1979: 428). Research is used along with 'experience, political insight, pressure, social technologies, and judgement' in a process that is familiar to decision makers (Weiss 1979: 429).

iv. political model. Research is used to support a position that has been taken or a decision that has been made and in this model it becomes 'ammunition for the side that finds its conclusions congenial and supportive' and gives 'advocates of [a] position confidence, reduces their uncertainties and provides them an edge in the continuing debate' (Weiss 1979: 429).

v. tactical model. Research in this model is used for purposes that have little bearing on the substance of the research. The fact of research rather than its content might be used to demonstrate the responsiveness of an agency to an issue, it might be used to delay action, it might be used to enhance the reputation or credibility of an agency, or it might be used to deflect criticism in the face of unpopular decisions or policy directions (Weiss 1979: 429).

vi. enlightenment model. Here there is no direct relationship between research and the policy process. Social science research 'percolates through informed publics and comes to shape the way in which people think about social issues' and 'provides decision makers with ways of making sense out of a complex world' (Weiss 1979: 429). Research used in this way need not be compatible with the values and goals of decision makers and there is the possibility that it might in fact challenge the status quo.

vii. intellectual model. Social science research in this model is one part of the intellectual enterprise of society as a whole and as such it responds to 'currents of thought, the fads and fancies of the period' (Weiss 1979: 430). It both shapes and is shaped by larger patterns of social thought.

Webber (1983) took these seven models of research utilisation and aligned them with argument styles. Of more relevance to the thesis Webber also classified the models according to the use of research in decision making in public policy. The knowledge-driven, problem-solving and enlightenment models were grouped together on the grounds that they are used directly by decision makers to improve the soundness of their decisions (Webber 1983: 337). The political and tactical models were grouped as alternative models because they are not primarily models of decision oriented use of research. The interactive and intellectual models were grouped together on the grounds that they blend direct use of research in decision making with alternative uses of information (Webber 1983: 338).

Information use as sense making

Essentially a communicative behaviour, the central activities of sense making are 'information seeking, processing, creating and using. Sense making is a process; *sense* is the product of this process' (Savolainen 1993: 16). It is the sense that people make of their experiences that allows them to continue their movement through space-time. To bridge the gaps in situations of discontinuity people use information to enable the continuation of their movement. In the sense-making triangle of situation-gap-use/help it is information use that helps people bridge the gap (Dervin 1992). A recent analysis of the metaphors used in sense making suggests that information use can be thought of a assembling or combining cognitive and affective elements in order to create steps and move forward (Savolainen 2000: 46).

The outcomes of two studies illustrate the ways in which information and its use contribute to sense making. Patients who had recently visited their doctors were asked about aspects of their visits, including the helps or 'utilities' that the answers to their questions gave them. The helps for people moving through their situations were: got encouraged; got new/altered specified picture; got new/altered general picture; could see the road ahead; identified possibilities; found direction/planned; got away from bad feelings; avoided pitfalls; and arrived, made progress (Dervin *et al.* 1980: 599). In a study of the information needs of Californian citizens, a different set of helps was derived from the ways in which people used the answers to their questions. The help categories that were identified were: creating ideas; finding directions or ways to move; acquiring skills; getting support or confirmation; getting motivated; getting connected to others; calming down or relaxing; getting pleasure or happiness; and reaching goals (cited in Dervin 1992: 75). Avoiding Machlup's call to keep use and effect separate, these helps indicate that answers to the questions asked by people underlie different types of information use.

Based on a synthesis of the work of Dervin (1980), Dervin and Nilan (1986) and others, Taylor (1991) proposed eight categories of information use. In the descriptions of the categories that follow Taylor highlights similarities with some of Dervin's empirically derived 'helps' or utilities.

i. Enlightenment: the desire for context information or ideas in order to make sense of a situation. Dervin calls this 'got pictures/ideas/understandings'.

ii. Problem understanding: more specific than enlightenment this category is oriented to better comprehension of particular problems. Dervin calls this 'able to plan'.

iii. Instrumental: finding out what to do and how to do something. Dervin calls this 'got skills'.

iv. Factual: the need for and provision of precise data with concerns for the quality of the data and the user's perception of quality.

v. Confirmational: the need to verify a piece of information or seek a second opinion which might either confirm or confuse the situation necessitating a reformulation of the problem or deciding which source to trust. Dervin calls this 'got support/assurances/confirmation'.

vi. Projective: future oriented and more concerned with estimates and probabilities rather than political or personal situations.

vii. Motivational: has to do with personal involvement. Dervin calls this 'got started/motivated'.

viii. Personal or political: has to do with relationships, status, reputation, and personal fulfilment. Dervin calls this 'got control, things got calmer, got connected to others, got out of a bad situation' (based on Taylor 1991: 230-231).

Although some of these categories seem to overlap with those developed by Pelz (1978) and Weiss (1979) they are based not on the utilisation of research information in policy making but on sense making and research in information science.

A cognitive process

The typology of information use as a cognitive process echoes some of the utilities, helps or uses of information identified by Dervin and her colleagues but it is not based on sense making. Derived from a single study of information use this typology is concerned primarily with changes in knowledge structures, or in Machlup's terms, the effects of information use. The types of information use are more restricted in their scope than those in the typologies discussed previously but they offer pertinent insights into the differences that information can make to what people know. Five different types of cognitive information utilisation constitute the typology: get a complete picture; get a changed picture; get a clearer picture; get a verified picture; and get a position in a picture (Todd 1999b: 15). Each type of information use relies on a pattern of predominant cognitive strategies identified as appending, inserting, and deleting (Todd 1999b: 15). In some ways, this typology elaborates the types and modes of information use that are labelled as conceptual or enlightenment.

Information seeking and use

The final typology also relies on a single study of aspects of information behaviour. Limberg (1999a) identified three types of information seeking and use without drawing a distinction between these two information behaviours. Limberg makes the point that studies of information seeking involve an element of information use so that the seeking process can continue and for this reason it is not possible to distinguish the two behaviours clearly. The three types on information seeking and use identified by Limberg (1999a, 122) are: fact-finding or finding the right answers to discrete questions; balancing information in order to choose or finding enough information to form a personal point of view on an issue; and scrutinising and analysing or understanding a topic. Again there are some similarities between these modes of information use and those in other typologies.

This survey of typologies of information use informed by empirical research highlights the diversity of approaches to what constitutes information use. There are some common themes that emerge from a consideration of information use within each typology. Table 1 that follows provides a summary of the typologies.

Table 1

Typologies of information use

Typology	Modes of information use		
Social science information use	instrumental use	conceptual use	symbolic use
Utilisation of research	knowledge driven problem solving	enlightenment intellectual	interactive political tactical
Sense making	problem understanding factual instrumental motivational	enlightenment projective confirmational	personal or political
Cognitive process		get a complete picture get a changed picture get a clearer picture get a verified picture get a position in a picture	
Information seeking and use	fact finding	balancing information scrutinising and analysing	

There are two observations to make about this Table. The first is that not all five typologies reflect all modes of information use. The second is that symbolic use appears to presuppose information use in a social and political environment. Symbolic use of information can be addressed possibly at the levels of both individual actors and the collective and this might also be the case with conceptual use.

Factors facilitating information use

The nature and character of information use is further amplified by consideration of the facilitating factors that emerge from the literatures in information science and information utilisation. These factors fall into three groups: those related to the information that is used, the context in which the information is used, and the people who use information.

Factors related to information

Information related factors concern the quality or values of information that is used as well as the judgements that are made about the goodness of information. Reviewing the work of earlier scholars such as Caplan *et al.* (1975) and Weiss and Buculavas (1977) as well as his own research, Snell (1983: 461) lists the characteristics of research that have an influence on its use by policy makers. These are:

- the quality of the research, including the credibility of the researchers
- the relevance of the information to the issues the policy maker deals with
- the extent to which the findings are oriented towards action
- the extent to which the research findings conform to user expectations
- the extent to which the research findings challenge the status quo
- the cost of implementing recommendations from the research
- the timeliness of the research in relation to the policymakers' needs
- the research methodologies used
- the social science disciplines involved.

Concern has been expressed about the research/policy gap and this seems to be based on an assumption that information is inherently 'good' and that its 'use' will result in improved decision making. The metaphor of two communities has been developed as an explanation for the gap between researchers and policymakers and approaches and strategies for bridging the gap between the communities have been suggested (Caplan 1979). Snell (1983: 464) argues that it might not be necessary to think about bridging the gap because of the different modes of information use. He asserts that instrumental use of information accounts for only a limited amount of research utilisation and argues that because conceptual use is the predominant mode of research utilisation the research/policy gap might not be as significant as has been thought. Further, he acknowledges the political dimensions of the environment in which policymakers operate and speculates that attempts to close the gap especially in relation to the symbolic mode of information use are likely to be futile. Snell (1983) urges both researchers and policymakers to adopt more realistic expectations of each other and to accept that research has a diffuse effect on policy decision making.

Impediments to information use have existed throughout history and in all parts of the world irrespective of the stage or level of development according to Saracevic (1986). He lists these impediments as being:

- There is too much information on a topic and the potential user is overloaded or overwhelmed – the sheer amount decreases the willingness to use information, taking too much time and effort.

- Information is presented in a language and/or terminology which is outside the user's experience – the language (be it a foreign tongue or 'technicaleese') impedes comprehension.

- Information is presented in a context with examples that are outside the user's cultural framework – the divergent cultural attributes impede the ability to relate to specific circumstances.

- Information is presented in a form that is hard to follow – the packaging may be an impediment to information absorption.
- Information may not be trusted – validity and reliability of information is not evaluated and this information is questioned (Saracevic 1986, 45-46).

Information consolidation, a process oriented towards resolving information problems in developing countries is proposed as way of overcoming these information related impediments (Saracevic 1986.) In this instance information refers to both documents as the containers of information and information itself or the content of the containers. Consolidated information is:

> …public knowledge specifically selected, analyzed, evaluated and possibly restructured and repackaged for the purpose of serving some of the immediate decisions, problems and information needs of a defined clientele or social group, who otherwise may not be able to effectively and efficiently access and use this knowledge as available in the great amount of documents or in its original form. The criteria for selection, evaluation, restructuring and repackaging of this knowledge are derived from the particular clientele (Saracevic 1986: 47).

The process of consolidating information adds value to information, increasing the possibility of its being used and ensuring that it will be used in ways that are appropriate to the people using it and their purposes for using it.

A similar approach to adding value to information has been outlined by Taylor (1986) who is more concerned with information transferred to information users through information systems. For Taylor information systems are interpreted broadly and are not limited to computer-based systems. Some of the value-adding processes that Taylor identifies are clearly concerned with providing access to information and to this extent are directed more towards information seeking than to information use. The values that are more attuned to information use are: quality as it relates both to the information that is transferred and to the performance of the system, adaptability or the match between the information that is transferred and the problem that the information addresses, time saving and cost saving (Taylor 1986: 62-69).

Factors related to the context of information use

The context of information use is a contested concept and there is no single agreed definition. Dervin (1997: 32) has described context as an 'unruly beast' and as 'something you swim in like a fish. You are in it. It is in you'. Context requires both understanding and taming. Talja *et al.* (1999) take the view that both objectified and interpretive approaches to context are possible. The objectified approach to context is more common in information behaviour research and is characterised by the evocation and description of context as external to information behaviour. By contrast, in the interpretive approach meaning and values are attributed to context and it assumes social, cultural and historical dimensions (Talja *et al.* 1999: 758). Vakkari (1997a: 460) has drawn attention to the confusion between context and situation in information behaviour research but there has been some attempt recently to clarify these two concepts. Cool (2001: 8) has suggested that 'contexts are frameworks of meaning, and situations are the dynamic environments within which interpretive processes unfold, become ratified, change, and solidify'.

Away from the difficulties of conceptualising context, Backer (1993: 219-220) has identified strategies associated with individual and organisational change that enhance information use/utilisation in innovation and the diffusion of new ideas. Three of the strategies resonate with the information consolidation process: planning and conceptual foresight regarding the adoption of an innovation in a new setting, user-oriented transformation of information, and potential user involvement in the adoption of innovation. The three remaining strategies bear more on the socially and culturally defined context in which information will be used: interpersonal contact between innovation adopters and those with direct knowledge about the innovation, outside consultation on the change process, and individual and organisational championship of the innovation. The effectiveness of these last three strategies depends to some extent on the capabilities of the person using information as well as on the social and cultural factors of the environment in which an innovation is adopted.

Factors related to people's capabilities

An important capability for information use is information literacy. Originating in the 1970's as an outgrowth of bibliographic instruction and user education in libraries in education institutions (Behrens 1990; Behrens 1994), this area of information practice is now supported by an identifiable research community (Bruce 2000; Bruce and Candy 2000). The scope of information literacy practice and research has broadened beyond educational institutions to include workplaces and beyond the preparation and presentation of assignments for the assessment of learning to encompass more explicitly the processes of knowledge creation (Mutch 1997). There are calls for the development and articulation of theory to underpin information literacy (Mutch 1999; Mutch 2000; Todd 2000).

In a study of information literacy in the workplace, the following propositions that underpin a process model of information literacy were presented:

- The model has two stages: an information consumption stage and an information supply stage where people provide information to others to seek and use.
- The information consumption stage has a cyclical and unpredictable nature. Information users keep redefining the task and taking appropriate action to seek and use information…until that information that has been supplied is adequate to achieve the task.
- The 'information seeking and use' stage is not necessarily neat and linear. Furthermore some of the stages can take place at the same time.
- Information supply is a mirror image of information consumption. In other words the information being supplied will be consumed by the audience at the same time.
- The evaluation stage is not necessarily at the end of the model. It is done throughout the process, and is built into each of the stages of the process (Wai-yi 1998: 80).

Personal capabilities involved in information use appear to include capacities for engaging in a creative and reflective process that has both cognitive and affective elements to it. Information users are required to be adept 'information processors' as well as confident in their approaches to using information. Not only do people require the skills necessary to analyse, synthesise and evaluate information but they also require high levels of presentation skills and interpersonal and group communication capacities. In some ways these skills bring to mind the capabilities required for the consolidation of information.

It is evident that there are many factors that encourage people to use information and act as barriers to information use. Table 2 which follows provides a summary of the factors identified in the information science and information utilisation literatures.

Table 2

Factors enhancing information use[1]

Information related factors	validity and reliability of information match between information and problem it addresses orientation of information to action volume of information available form and presentation of information language of presentation accessible
Context related factors	relevance of information to issues and problems timeliness of information appropriate cultural framework of information challenge to status quo individual champion of change foreshadowed by information and innovation
People related factors	conformity of information to people's expectations willingness to use information involvement in, or contribution to, repackaging of information comprehension of information presented levels of information literacy

This table has drawn on the work of Backer (1993), Wai-yi (1998), Saracevic (1986), Snell (1983) and Taylor (1986).

Summary

This analysis of the literature of information use from the fields of information science and information utilisation has implications that are significant for the thesis. It illustrates the ambiguity surrounding the concept of information use, offers some explanations for that confusion and urges acceptance of the richness and complexity of information use. The analysis suggests some parameters for the empirical study that supports the thesis. The study requires a focus on information use from the point of view of the people who use information and the withholding of a definitive statement on what constitutes information use until the study is completed. The challenge that the study presents is perhaps indicated most strongly in the description of information use as ‘a complex phenomenon involving environmental, organisational and attitudinal components as well as the specific characteristics of information’ (Oh 1997: 6).

Chapter 3

Methodological location of the thesis

The discussion of the concept of information use in the preceding Chapter of the thesis mandated a thoughtful analysis of possible approaches to researching information use and a diligent process for selecting the most appropriate approach. Five topics shape the discussion of the methodological location of the thesis:

- the current state of information use research
- approaches and models in information behaviour research
- criteria for selecting a research approach
- characteristics of the selected research approach, phenomenography
- critiques of phenomenography.

The current state of information use research

A useful guide to the state of information use research is the biennial Information Seeking in Context Conference. Most of the studies reported at the initial international research meeting in 1996 explored information needs and information seeking (Vakkari *et al.* 1997) leading to the observation of one of the leading researchers in the field that information use is a 'seldom studied area' (Vakkari 1997: 460). At the second meeting in 1998 information seeking studies dominated and there were a few studies of both information seeking and information use (Wilson and Allen 1999). At the third meeting in 2000 the proportion of studies of information use increased compared to the previous meetings although studies of information seeking still dominated (Höglund and Wilson 2000; Höglund and Wilson 2001). It could be reasonably expected that there will be a further increase in the number of information use studies reported at the fourth meeting in 2002.

It is interesting to speculate on the reasons for the relative lack of information use research. One reason may be the ambiguity surrounding the nature of information use, a theme that emerged in the previous Chapter of this thesis. In a very brief overview Larsen (1985) traces developments in information use research. Originally 'information use' was defined as 'implementation of the information exactly in the form originally presented to the potential user' (Larsen 1985: 144). It has since been accepted that there is no one single event or activity that constitutes information use, although uncertainty about its multidimensional and complex nature remains.

Tuominen and Savolainen (1997) also comment on the changing nature of what is regarded as information use. Noting that the number of studies of information use has remained rather low, they refer to the predominance of surveys over analyses of the actual use of information. They are led to suggest that issues of information use have been 'reduced to such questions as how often different information sources and channels have been consulted within a certain period of time' (Tuominen and Savolainen 1997: 81). A similar suggestion was implied in Wilson's (1994) identification of citation analysis as the major strategy for determining what information has been used. Certainly surveys and citation analyses are useful in their own right for planning and evaluating library and information services or for tracking the growth of bodies of literature but they reveal little about ways in which information might have been used.

Information behaviour research has featured methodologies, methods and techniques commonly associated with the alternate paradigm for some time. The INISS Project in the UK, (Wilson and Streatfield 1977; Wilson *et al.* 1979) for example, relied on interviews and observations well before Dervin and Nilan (1986) called for the development of an alternate paradigm in information science. The information use environment (Taylor 1986; Taylor 1991) offers an alternative unit of study to individuals and groups of information users. Dervin's (1992) sense making approach broadens the understanding of information to considerations of its social and cultural nature. The explication of domain analysis by

Hjørland and Albrechtsen (1995) rests on a view of information science as a social rather than a mental discipline and reinforces the interdisciplinary and transdisciplinary nature of studies of information behaviour. Among the approaches that are likely to yield fresh insights into information use are discourse analysis (Talja 1997; Olsson 1999), including the analysis of metaphors (Savolainen 2000), and phenomenography (Bruce 1997a; Limberg 2000b). These approaches are closely aligned to developments in hermeneutics.

Apart from these theoretical and methodological developments, computer aided mapping tools and techniques have made possible analyses of a kind that were previously beyond the reach of researchers. For example Todd (1999b) was able to record the impact of information use on the knowledge structures of individual information users using tools downloaded from the Internet. There is then the possibility of shifting the focus more to information use as this aspect of information behaviour increasingly becomes more amenable to investigation.

Approaches and models in information behaviour research

One of the themes emerging from the discussion of the theoretical location of the thesis concerns the importance of studying the interactions between people and information in the course of their daily lives but the discussion presented few clear directions for the study of information use. It might be assumed that existing models of information behaviour could conceptually and methodologically position information use research. In their review of conceptual frameworks in information behaviour, Pettigrew *et al.* (2001: 46) outline three different approaches: cognitive approaches that 'examine the individual as the main driving force behind information behavior', social approaches include focus on the social context of information behaviour, and multifaceted approaches that consider the cognitive, social and organizational contexts of information behaviour. On the basis of the analysis of typologies of information use in the previous Chapter any one of these three approaches is appropriate in information use research.

In a similar review of information behaviour, but from the point of view of methodologies used in research, Wang (1999: 59, 83) identified six areas of investigation: information needs and uses, information seeking, relevance judgement, online searching, human and systems interactions and reference transactions. The four major methods used in the studies included in the review were surveys, interviews, experiments and observation. This review appears to support some of the reasons given for the lack of information use research particularly as they concern the nature of information use and the focus on information sources and channels. To some extent too the review seems to reinforce representations of the information user as a monologic actor devoid of diversity and nuance.

Some of the models of information behaviour are broad in their scope and extend beyond information use. Although they offer some guidance in the selection of appropriate methodologies the assumptions on which they are based are not necessarily germane to the thesis. The initial model of information behaviour developed by Wilson (1981: 8) was predicated on a person's physiological, cognitive and affective needs and suggested that context was a key element in shaping information behaviour. The model has since been elaborated by research drawn from fields other than information science and much of it highlights the significance of psychological factors in information behaviour (Wilson 1997: 569). Both of Wilson's models have an integrating function and they represent information behaviour holistically.

Implicit in any model is a set of assumptions that guide its development. For example, the sense-making theoretic perspective developed by Brenda Dervin (1983) is posited on three elements: a situation that contextualises a person's information problem in time and space, a gap that leads to information seeking and the 'helps' that are made of information as the person bridges the gap and makes sense of the situation as it appears. In terms of information use, a methodology based on sense making is designed to reveal the gap bridging process and would usually rely on the method of a time line interview (Dervin 1992).

Models also imply definitions of key concepts derived from the settings that have informed the models. For example, one model that identifies common patterns in information seeking by researchers focuses on the use of published information sources (Ellis 1993; Ellis *et al.* 1993; Ellis and Haugan 1997). Another model, Kuhlthau's (1991; Kuhlthau 1993b) Information Search Process (ISP), reflects the stages in completing an assigned information task. A strength of the ISP model is its recognition of both the cognitive and affective dimensions of information behaviour, a strength shared with Wilson's (1981) model.

A model by its very nature presents a simplified view of concepts and their relation to each other. The models already cited are views from the worlds of people needing, seeking and using information. There is though an unresolved tension between the user perspective presented in some information behaviour research and the multiple realities that should underpin theorising from that research. Little critical attention has been given to the meanings behind the label 'information user'. A discourse analysis of Kuhlthau's (1993b) seminal text demonstrated that some so-called user oriented research perpetuates a monologic view of the information user and prompted Tuominen (1997) to challenge information science researchers to reconcile the diversity and multiplicity of the voices of information users with the stance they adopt in their research.

Byström (1999) suggested the term 'doer' in preference to 'user' and identified three types of doers distinguished by the extent to which information behaviour is influenced by their environments, group memberships and roles as dimensions of context. The doers are characterised as:

- the Platonian type who is an autonomous actor. The doer's information behaviour is a result of rational and free choices that reflect personal characteristics and are only externally affected by the environment.

- the Chessman type who is a completely socially determined 'anti-individual' whose thoughts and actions can be equated with the collective. The doer is a product of the context and because the individual does not exist as such on an intellectual level information behaviour is equated with the context.

- the Debater type who is a dialectical actor with his own will but who shapes and is shaped by the environment in a continuous process. Information behaviour is affected by both personal and contextual characteristics (based on Byström 1999: 87-88).

It is the third type, the Debater, who reflects recent developments in information research and the increasing attention given to the role of social interaction in information transfer and knowledge creation (Nonaka and Takeuchi 1995: Brown and Duguid 2000). The approach then needs to build on the people-centred focus that has emerged in information behaviour research since the 1980s (Wilson 2000b: 51) and reinforce the contextualised approach identified by Vakkari (1997a).

Selecting a research approach

It was against this background of the state of information use research and the limitations of some of the widely accepted models of information behaviour that the selection of a research approach was made. It was clear that the research approach was required to respect the complexity of information use and the diversity of people using information and address some of the limitations of existing models and approaches. For this reason the researcher developed a set of criteria for the selection of an approach, applied it to potentially useful research approaches and then confirmed the choice by reference to a published cognitive map of qualitative research.

Criteria for selecting an approach

The criteria were developed primarily on the basis of the purpose of the study in revealing how people actually use information. Other important considerations included different perspectives on information and information use and limitations inherent in any study of information behaviour. The criteria were informed also by an analysis of the literature related to information use research and research traditions in the social sciences (Lincoln and Guba 1985; Strauss and Corbin 1990; Lincoln and Denzin 1994; Crotty 1998; Creswell 1998; Denzin and Lincoln 2000).

The researcher required the selected approach to conform to the following criteria:

i. reflect the complexities of people focussed perspectives in research
ii. take account of the diverse interactions among people and information that can be attributed to the characteristics of individuals, the nature of information and the situations in which information use occurs
iii. ensure that the concepts developed and defined on the basis of the study emerge from the participants in the study
iv. function as an open divergent process that could be refined as the study progresses
v. permit the researcher to use her knowledge of information use and her capacities in interpersonal communication in the study.

The research approach was also required to be acceptable to the information behaviour research community so that the study's outcomes could contribute to the theorising in the field. In influencing information behaviour the thesis and the study might bring some of the information science communities a little closer and by influencing information practice the thesis and the empirical study might bring the worlds of research and practice a little closer (Grover and Greer 1991). In order to meet this requirement the research approach needed to:

i. reflect the demand for 'inventing new ways of looking at users and linking [information] systems to them' (Dervin and Nilan 1986: 16). To this extent the study is located within the established stream of information behaviour research that relies on qualitative research approaches (Wilson 2000b) and seeks to adopt a 'holistic, reflexive and empirical and dialectical' stance (Harris, 1986: 525).

ii. respond to a question about new ways of looking at information users: 'is there any authentic or truly user-centred way to make representations of users' experiences?' (Tuominen 1997: 367).

In meeting the requirements to contribute to the field of information behaviour and demonstrate the appropriateness of the selected research approach, the empirical study and the thesis it shapes should be able to extend what is known about information use and information behaviour.

Applying the criteria

The four research approaches that were considered all fall within the rubric of qualitative research. The approaches included grounded theory (Glaser and Strauss 1967; Corbin and Strauss 1990; Glaser 1992; Strauss and Corbin 1990), sense making (Dervin 1972; Dervin 1983; Dervin 1992; Dervin 1999), phenomenology (Spiegelberg 1982; Giorgi 1989b, Giorgi 1999) and phenomenography (Marton 1981a; Marton 1981b; Marton 1988; Marton 1994a; Marton and Booth 1997). The criteria related specifically to perspectives on information users and their interactions with information that allowed a judgement to be made about the suitability of each approach to the focus of the study, information use.

The grounded theory approach has evolved since the arguments for its logic and procedures were first published (Glaser and Strauss 1967). It has maintained its original intent of building 'an inductively derived grounded theory about a phenomenon' (Strauss and Corbin 1990: 24). The development of theory is a possible outcome of an empirical study of information use but the more likely outcome is a set of descriptions or themes that might then form a focus for theory development. There is also a risk that the coding procedures associated with grounded theory might distort the researcher's interpretations of information use. This risk was acknowledged by one of the founders of grounded theory who expressed concern that these procedures seemed to force theory onto the data rather than facilitate the emergence of theory from the data (Glaser 1992). The forcing of theory onto data is a danger inherent in qualitative research approaches and one that is not necessarily negated by strategies such as member checking (Lincoln and Guba 1985: 236).

Dervin's sense making has an established place in information behaviour research and offers 'an approach to studying the constructing that humans do to make sense of their experiences' (Dervin 1992: 67). The approach takes a constructivist view of information and its use as a help in the sense making process by individuals. The methods used in the approach are directed towards descriptions of the situation-gap-helps triangle (Dervin 1992: 69-70). Because of the focus in this approach on the process of sense making rather than on peoples' experiences of information use it was considered inappropriate for the empirical study underpinning the thesis. The characteristic features of the sense-making triangle and the assumptions about information seeking and use that guide the data collection and analysis in this approach will not necessarily reveal how people actually use information.

Neither the grounded theory approach nor the sense making approach in itself ensures that variation in the experiences of information use will emerge from the data or that any themes that do emerge necessarily represent the reflections of information users on those experiences. The limitations of these two approaches in ensuring fidelity to people's experiences highlight not only the methodological difficulties of studying information use but also some of the challenges in studying experiences and meanings as well as actions and objects. While individual studies using these two approaches have been fruitful (Ellis 1993; Edwards and Poston-Anderson 1993) the appropriateness of these approaches to the study and the thesis remains uncertain.

The next research approach that was considered developed from the philosophical tradition of modern phenomenology with its origins in the writings of Husserl (see for example Spiegelberg 1982). Its explication as a research approach has occurred mainly in the field of psychology where 'the examination of conscious experience…is one of the critical tasks' (Polkinghorne 1989: 43). The approach offers a way of moving beyond the behavioural focus of grounded theory and sense making into 'phenomenon as lived and experienced' thereby enabling the participants in a phenomenological study to have their voices heard (Giorgi 1989a: 31). There is, though, one of the selection criteria that this promising approach is not able to meet. The focus of the approach is the essence or structure of experience that emerges from the participants' descriptions of that experience. The essence is 'the most comprehensive invariant meaning' perceived by the researcher (Giorgi 1989a: 70). It is neither universal nor eternal, nor is it simply an empirical generalisation. It does not meet the criterion that the approach takes account of the diverse interactions among people and information. The unveiling of essence will not necessarily reveal variations in peoples' experiences of information use.

The approach that was finally selected for the study is phenomenography. It was this approach that most closely met the criteria and overcame some of the limitations of the three other approaches that were considered particularly the limitation inherent in the phenomenological approach. Phenomenography is a research approach that seeks to uncover 'the relatively limited number of qualitatively different ways that a phenomenon is conceptualised by those who have experienced it' (Marton 1981a: 180-181). It is concerned with 'mapping the qualitatively different ways in which people experience, conceptualize, perceive and understand various aspects of, and phenomena in, the world around them' (Marton 1986: 31).

Phenomenography shares with phenomenology an interest in the experience of a phenomenon but with a focus not on its essence but the variations in the experience of the phenomenon. Since the development of the approach in the 1970s phenomenography has been used as a research approach in several different fields in the social sciences particularly in education.

A comparison of the four approaches on the criteria for selecting a research approach and the requirements for making a contribution to information science is offered in Table 3 that follows. Although all the approaches met the requirements for contributing to information science it was only phenomenography that met all the criteria demanded by the particular study of information use embedded in the Thesis. In Table 3 a tick indicates that the criterion or requirement was met and a cross indicates the researcher's doubt that a criterion could be met.

Table 3

Selection of research approach

	Grounded theory	Sense making	Phenomenology	Phenomenography
1. An approach appropriate to the study				
Reflect complexities of people-oriented perspectives	✔	✔	✔	✔
Take account of diverse interactions between people and information	✔	✔	x	✔
Concepts emerge from participants	x	x	✔	✔
Open, divergent process	✔	x	✔	✔
Researcher's use of knowledge of information use	✔	✔	✔	✔

2. An approach appropriate to information science				
Linking people and information	✔	✔	✔	✔
Represent people's experiences of information use	✔	✔	✔	✔

Confirming the choice of a research approach

The choice of the research approach, phenomenography, was confirmed by reference to a cognitive map of qualitative research that locates more than twenty research approaches from the fields of sociology, psychology and education (Tesch 1990). The organising principle of the cognitive map is derived from the major form of data in qualitative research and a form common to the four approaches that were considered. That form is words. From this starting point the cognitive map diverges into four pathways according to the research interest or general analytical objective of the research. The four different areas of research interest are:

i. the characteristics of language
ii. the discovery of regularities
iii. the comprehension of the meaning of text/action
iv. reflection (based on Tesch 1990: 59).

There are pathways developed at different levels through each area of research interest and it is possible to locate a particular research approach on the cognitive map as a way of confirming its appropriateness to a particular research project. In a sense the cognitive map provides a bottom-up view of possible research approaches that complements the top-down view taken in the process of choosing among four possible research approaches that seemed appropriate to the empirical study. In the event the selection process was an iterative one with interplay among the research questions and the approaches that could be taken to answering them.

Phenomenography is located in the area listed in second place above where the research interest lies in the discovery of regularities and along one of two paths, the one concerned with discerning patterns or regularities in terms of commonalities in this approach in conceptualisation (Tesch 1990: 63). This location is appropriate for the study in that it seeks to identify different understandings of information use based on peoples' experiences. Grounded theory is also located in the same area of research interest but along the second path that is concerned with the identification of elements and exploration of their connection or regularities in terms of lawful order. This location confirms the judgement that grounded theory is not an appropriate approach for the study.

The area of research interest in which phenomenology is located is listed in third place above in the comprehension of meaning of text/action along a path that features the discerning of themes and the finding of commonalities and uniqueness. It is acknowledged that the discerning of themes is quite close in its location on the cognitive map to the kinds of research that seek to discern patterns but the former is likened to discerning essence and the latter to discerning regularities in the sense of order (Tesch 1990: 67-68). The judgement made to reject phenomenology as the research approach on the basis of the selection criteria is confirmed by its location on the cognitive map of qualitative research. Sense making as a research approach has not yet been located on the cognitive map and so it could not be considered any further.

Phenomenography, the selected research approach

Phenomenography emerged from the work of a group of researchers at the University of Göteborg in the 1970s. Led by Ference Marton the researchers initially held to the practical aim of describing peoples' conceptions of aspects of the world around them especially but not exclusively as they related to learning. It was not until 1981 that Marton, regarded as the founder of this empirical research approach, first used the term 'phenomenography' (Svensson 1997: 160). Since then phenomenography has become more influential in education and in other fields as well. For example one analysis shows that by 1994 the approach had been used in more than 50 doctoral theses and between 500 and 1,000 research reports published around the world (Alexandersson cited in Sandberg 1997: 204).

There have been some developments that point to the articulation of a theoretical foundation to what was originally conceived as an empirical research approach. For example international symposia and conferences have been held to discuss the ontological, epistemological and methodological assumptions underlying phenomenography (Bowden and Walsh 1994; Ballantyne and Bruce 1994) and an issue of the international refereed journal *Higher Education Research and Development* (1997) has been devoted to phenomenography. This research approach has also attracted critique and comment from researchers who are phenomenographers (Uljens 1992, Uljens 1996; Säljö 1997; Ashworth and Lucas 2000) as well as from those who do not describe themselves as phenomenographers (Webb 1997; Richardson 1999).

The brief explanation of phenomenography that follows describes four features of the approach as background to a more detailed consideration of the study itself in the next Chapter of the thesis. These features are: the lines of phenomenographic research, the nature of experience and awareness, the knowledge interest of phenomenography and the outcomes of a phenomenographic study.

The lines of phenomenographic research

Three different lines of phenomenographic research based on the focus of research interest have been identified. Two are associated with learning and the third with disciplines other than education (Marton 1988). The first line of research related to learning is concerned with the outcomes of learning and the approaches adopted by learners. The focus in these studies is the qualitatively different outcomes of learning and the qualitatively different approaches that are adopted by learners. This focus is different to that of learning theory within the field of psychology with its concentration on mental processes and cognitive structures.

The second line of research is concerned more with the content of learning and students' qualitatively different understandings of ideas and concepts within subject domains. These two lines of research have recently been described as developmental phenomenography, the purpose of which is to enable students to learn more effectively by using the outcomes of research into peoples' experiences of some aspects of their world in formal educational settings. (Bowden 2000: 4-5).

It is the third line of research that is the most relevant to the study of information use. This line is held to correspond to a more 'pure' phenomenographic knowledge interest in that its focus is the qualitatively different ways in which people understand various aspects of their worlds. Some examples of the phenomena that have been studied include patients' conceptions of medicine and medication (Dahlgren and Fallberg 1991), nurses' understanding of technology in contemporary surgical nursing (Barnard *et al.* 1999), organisational change agents' conceptions of their roles and change strategies (Dunkin 1999) and human competence in the workplace (Sandberg 2000).

An alternative typology of phenomenography has been proposed by Hasselgren and Beach (1997: 199) based not on the focus of the research interest but on approaches to the different discursive contexts in which the descriptions of the qualitatively different ways that a phenomenon is experienced, contextualised or understood. These authors are critical of phenomenography to the extent that 'the idea that data are descriptions of the internal relation between persons and things seems to be unproblematically accepted' (Hasselgren and Beach 1997: 193). However, the explanation they offer for this situation resonates with the growing sophistication of phenomenography and the attention given by phenomenographers to articulating a theoretical framework. The different modes discerned from an examination of the work of the Göteborg phenomenographers are:

- experimental
- discursive

- naturalistic
- hermeneutic
- phenomenological.

On the basis of their analysis, Hasselgren and Beach (1997: 200) suggest that the hermeneutic and phenomenological modes might benefit from 'phenomenological underpinnings' as a way of explicating a philosophical foundation for phenomenography. Even so, they conclude that phenomenography is a productive research approach.

The two modes that are most relevant to information use are the discursive and the phenomenological. The discursive mode is very similar to Marton's third line of 'pure phenomenography' and is illustrated by a study in which the knowledge interest is restricted to price formation through an investigation of the question: Why does a bun cost two shillings? This mode is described as the 'least sophisticated way of doing phenomenography' (Hasselgren and Beach 1997: 197). The phenomenological mode is illustrated by a study of conceptions of political power that was carried out at the time of the construction of a garage in the Göteborg city centre (Theman cited in Hasselgren and Beach 1997). The predominantly discourse-based analysis of phenomenography has clear implications not only for the design of a phenomenographic study but also for the gathering of data, its analysis and interpretation.

Before proceeding to elaborate other key features of phenomenography as a research approach there are two areas in particular that present difficulties to scholars and require some explanation. The first area concerns the origins of phenomenography in learning research and the second the evolution of the approach over time. With the beginnings of this research approach in studies of student learning it is to be expected that studies in Marton's first two lines of research outnumber those of 'pure' phenomenographic interest. One of the consequences is that much of the literature pertaining to phenomenography is grounded in educational research, its language, and its concerns. This grounding presents challenges and difficulties to scholars from fields other than education in extrapolating the approach to other fields of scholarship each with their own theoretical interests, research traditions and discourse communities.

As with any dynamic and evolving approach there are difficulties with terminology and the challenges presented by phenomenography in this respect are not unique to it. In recent years the term 'way of experiencing' has come to replace the term 'conception', a replacement endorsed by Marton on the grounds that 'way of experiencing' is a more generic term than either the synonymous (at least in phenomenographic parlance) 'conception' and 'experience' (Marton 1996, 172-3). In this thesis 'conception' and 'experience' are used in preference to 'ways of experiencing'. There are two reasons underlying this preference. Firstly the two synonymous terms are still in use in the literature published since 1996 and secondly, and perhaps more importantly, these two terms are used in the few studies in information science that have adopted phenomenography as the research approach.

The nature of experience and awareness

In elaborating the theoretical underpinnings of what originated as a series of empirical studies of learning, Marton has referred to the work of the phenomenologist Husserl and psychologist Gurwitsch (Marton 1994b). Husserl's notion of intentionality (see Kersten 1997: 350-355) which he in turn attributed to Brentano is evident in the very essence of phenomenography and its goals and approaches to exploring phenomena as experienced by people. The work of Gurwitsch is integral to Marton's structure of awareness that is fundamental to phenomenography's interest in the variation in human experience of the world. Although these underpinnings have been elaborated and refined over the past thirty years or so the essence of the phenomenographic project has remained constant: describing the experience of phenomena from the perspective of the phenomenon as it is experienced by people (Marton 1981a; Marton 1986).

According to the non-dualistic ontology on which phenomenography rests there is only one world as opposed to the two worlds of dualistic ontology. The real objective world and the subjective world of cognitions and mental representations are one and the same. Marton elaborates:

> There is only one world, a real existing world, which is experienced and understood in different ways by human beings. It is both objective and subjective at the same time. An experience is a relationship between object and subject, encompassing both. The experience is as much an aspect of the object as it is of the subject. After all the expression 'how the subject experiences the object' is synonymous with the expression 'how the object appears to the subject'. 'Experience' ('conception', 'understanding', 'perception', 'apprehension' etc) is thus used in phenomenography in the sense of a relation between subject and object, as 'something seen in some way by someone'. Although the relation is neutral to the distinction between subject and object, someone's way of experiencing something can be seen in relation to other's ways of experiencing the same thing or to the same individuals' way of experiencing other things (Marton 1994a: 91).

The fundamental characteristic of the experience of a phenomenon is that 'it is of its essence nondualistic being neither physical nor psychological, located in neither people nor the world, and neither mind nor matter' (Marton and Booth 1997: 122). A conception is a representation of the relationship between subject and object and it reflects the experience of a phenomenon from the perspective of the phenomenon as it is experienced by each individual (Marton 1981a; Marton 1986; Marton 1992).

In developing a structure of awareness Marton (1996) draws attention to two important features of awareness. The first is that humans cannot be aware of everything at the same time in the same way and the second is that we are aware of everything at the same time but not in the same way. These features recall the work of Gurwitsch that Marton acknowledges directly when he distinguishes between:

> …the object of focal awareness - the theme - and those aspects of the experienced world which are related to the object and in which it is embedded – the thematic field…the same theme can be seen against the background of different thematic fields…all that which is co-existent with the theme, without being related to it by dint of the content or meaning, Gurwitsch calls the 'margin' (Marton, 1994a: 96).

The structure of awareness as related to the experience of a phenomenon consists of similar elements to the theme, thematic field and margin:

> The theme appears to the subject in a certain way; it can be seen from a particular point of view. The specific experience (or conception) of a theme…can be defined in terms of the way in which it is delimited from and related to a context, and in terms of the way its component parts are delimited from and related to each other and to the whole (Marton, 1994a: 96).

It is Marton's contention that an experience of something in the world or a conception of a phenomenon has two key aspects which are dialectically intertwined: a structural 'how' aspect and a referential 'what' aspect. The referential or meaning aspect refers to the meanings that are attributed to what is experienced by those who experience it. The structural aspect refers to the way that what is experienced and its component parts are delimited and related to each other. The internal horizon of the structural aspect refers to how the component parts are understood and related to each other and the external horizon refers to the way the whole is delimited from and related to its context (Marton *et al.* 1993; Marton and Booth 1997).

The individual experience of a phenomenon has internal and external horizons, but in the horizons are present other possible ways of experiencing, or conceptions of, the same phenomenon. Because an experience of a phenomenon is an internal relation between subject and object and because awareness of the subject-object relation differs within and between individuals then the experience of a phenomenon can be seen as a 'complex' of the different ways in which it can be experienced (Marton 1994 a: 92). And because these different ways are ways of experiencing the same phenomenon then they can be logically structured. Variation in the experience of a phenomenon is suggested not only by the horizons of individual experience of a phenomenon but also by the meaning aspect.

The knowledge interest of phenomenography

The knowledge interest of phenomenography lies in describing the different conceptions of a phenomenon that are present among people in a particular context (based on Bruce 1997a, Marton 1988). It is people's experiences of phenomena rather than people or phenomena themselves that represent the key interest of phenomenograply. Because conceptions and action reflect each other it then becomes possible to celebrate the joys and address the issues that are embedded in experiences of phenomena. As Marton and Booth (1997: 111) suggest,

> …in order to make sense of how people handle problems, situations, the world, we have to understand the way in which they experience the problems, the situations, the world that they are handling or in relation to which they are acting.

Conceptions that are central to the knowledge interest of phenomenography have a number of essential characteristics that flow from the relational nature of the experience of phenomena. Conceptions are relational in nature and are dependent on human activity and the world or reality external to the individual. In the same way that phenomena are neither naturally given nor constructed by individuals independent of external reality so conceptions are neither naturally given entities nor totally subjectively constructed entities. A fundamental assumption then is that:

> … reality presents itself in human thinking as different related entities having the character of forming units or wholes [phenomena]. What we refer to as knowledge is based on this differentiation of wholes. This is a sufficient assumption to form the basis of the phenomenographic aim of describing conceptions…the conception has to include some whole-qualities of the meaning of [a phenomenon] (Svensson 1997: 166).

Because the referential and structural aspects of conceptions are dialectically related, the variation in the meaning of a phenomenon within and across individuals can be attributed to these aspects. Conceptions are neither common to all individuals nor unique to any one individual (Johansson *et al.* 1985). Being neither fixed nor stable in meaning, conceptions are dynamic and dependent on the context and situation in which they are apprehended.

As abstractions, conceptions need to be made visible so that the qualitatively different experiences of a phenomenon can be understood. Phenomenographic studies rely on description of a certain kind. The subjective nature of human experience suggests that descriptions of conceptions and phenomena should adopt a second-order perspective so that:

> We are not making statements about X…but about peoples' ideas about X…we are not trying to look into the [individual's mind] but we are trying to see what he or she sees; we are not describing minds, but perceptions; we are not describing the [individual] but his or her perceptual world (Johansson *et al.* 1985: 247).

What is described is not the phenomenon itself but facets of it seen from the perspectives of those who have experienced it. Conceptions can be expressed in different forms of action but they are most accessible through language (Svensson 1997). There is an emphasis on description in making conceptions visible but at times graphic forms of representation are also used to uncover conceptions (see for example Barnard *et al.* 1999: 221).

Outcomes of phenomenography

The outcomes of a study using phenomenography as the research approach are typically presented in two forms: categories of description and an outcome space. There is some criticism from within phenomenography of the confusion between the terms 'conceptions' and 'categories of description' (Bowden 2000: 16), a confusion that seems to be perpetuated in the work of leading phenomenographers (Trigwell 1997: 45). Sandberg (1997: 204) explains that 'conceptions are typically presented in the form of categories of description'. The difference between conceptions and categories of description is that:

> Conceptions, which make up our unit of analysis, refer to whole qualities of human-world relations. They also refer to the qualitatively different ways in which some phenomenon or some aspect of reality is understood. When trying to characterize these conceptions, we use some categories of description. The categories are, however, not identical with the conceptions – rather they are used to denote them (Johansson *et al.* 1985: 249).

Categories of description have some distinctive features. They are relational in that they focus on the subject-object relations of the conceptions that they denote. They are experiential in that they are based on the experiences of the research participants and adopt a second-order perspective on the phenomenon. They are content-oriented and focus on the meaning of the phenomenon being explored to those who experience the phenomenon. The categories of description are qualitative in that they are descriptive and made visible through language (Marton 1988: 181).

The variation in conceptions of a phenomenon as captured in the categories of description can emerge from differences within individuals or among individuals or from both within and among individuals. Just as no one individual's way of experiencing a phenomenon can constitute the totality of the phenomenon itself so the researcher's description of conceptions based on the reports of the research participants is no more than a 'partial constitution of the phenomenon' (Marton and Booth 1997: 125). It is however as complete a constitution of the phenomenon as the collective experience of the research participants, or the pool of their meanings, allows.

The set of categories of description and the relationships between them form the outcome space of phenomenographic research often represented in diagrammatic form (Bruce 1997b: 113-114; Barnard 1999: 221; Dunkin 1999: 159). The outcome space shows the complex of different ways in which a phenomenon or an aspect of the world can be experienced. These experiences are logically related because they are experiences of the one phenomenon or aspect of reality. The outcome space is a structural framework within which the categories of description that denote conceptions exist and 'each category is a potential part of a larger structure in which the category is related to other categories of description (Marton 1986: 35).

In the same way that categories of description denote conceptions the outcome space denotes the phenomenon that it describes. The outcome space is 'the logically structured complex of the different ways of experiencing an object' (Marton 1994a: 92). The outcome space is not the phenomenon or aspect of the world itself, the first order noumenal perspective, but the phenomenon or aspect as it is understood, the second order experiential perspective. An experience then is part of a whole and a whole that is both objective and subjective at the same time because of the nondualist ontological stance of phenomenography (Marton 1981a: 180).

The set of categories of description or the qualitatively different ways of experiencing a phenomenon usually form a hierarchy in terms of complexity and inclusiveness. Marton and Booth (1997: 125) identify three criteria for the quality of a set of categories of description:

i. each category should reveal something distinct about a way of experiencing a phenomenon
ii. each category should stand in a logical relationship with other categories
iii. the number of categories in a set is determined by the extent of variation. In any event it is limited in number.

These criteria are addressed in more detail in Chapter 7 in the discussion of the outcomes of the empirical study.

Critiques of phenomenography

Phenomenography has not been without its critics both within and outside its own research community. Within the community, the more serious contention has been about the reliability of the outcomes of phenomenographic studies. Concerns about reliability threaten phenomenographic research as a whole and it is incumbent on researchers using the approach to attend to matters of trustworthiness with meticulous care. Less contentious perhaps in terms of impact on the approach itself but still of concern to researchers is the matter of changing perspectives on some of phenomenography's key characteristics. These changes are perhaps inevitable as phenomenography evolves and develops from an empirical research approach to a research tradition with its own philosophical underpinnings (Dahlin 1994). What these concerns indicate to researchers though is the need to be clear about their understanding of the key concepts and characteristics of the phenomenographic approach and to make their understanding clear to those who read the reports of their research.

The reliability of the outcomes of studies using phenomenography has been questioned by Sandberg (1997). The reliability of phenomenographic studies has been verified usually by establishing inter-judge reliability. Sandberg rejects this measure of reliability for two reasons. Firstly, he argues that inter-judge reliability shifts the focus away from procedures that researchers use to ensure the faithfulness of the categories of description to the testing of interpretations. Secondly, he points to an inconsistency in applying inter-judge reliability with its origins in the positivist research tradition to phenomenographic research that relies more on the phenomenological tradition.

In order to address the fidelity of the categories of description Sandberg (1997) calls on phenomenographic researchers to develop what he calls interpretative awareness by entering phenomenological reduction. Following Ihde, Sandberg relies on the steps of phenomenological reduction to 'circumvent certain kinds of predefinition' (cited in Sandberg 1994: 67; Sandberg 1997: 209). These steps serve as interpretive guidelines so that researchers can control and use themselves as interpreters in the research process' (Sandberg 1994: 67).

Burns (1994) also addresses the faithfulness of the categories of description and suggests establishing a phenomenographic study as a collaborative exercise between the researcher and the participants. The collaboration would extend to a critique of the categories of description and the conceptions they denote by the participants as research collaborators. This collaboration resonates with the member checking protocols of qualitative research approaches generally but the status of research participants in relation to the researcher is not necessarily constant throughout the research. Burns (1994) also suggests a critique of the procedures and findings of a study by the research community.

In regard to changing perspectives on the key features of phenomenography Bowden (2000: 16) addresses what he sees as a misuse of the term 'conception'. He rejects the use of the term by Säljö, one of the original Göteborg group and an early co-researcher with Marton, as being the equivalent of a category of description. Bowden (2000: 15) also questions the interpretation of conceptions made by Francis (1996) as reflecting the experience of the individual rather than the collective. Such an interpretation, according to Bowden, overlooks the development of the categories of description through its relation to a number of other people's categories of description. Bowden's argument is centred on the process of data analysis in phenomenography. He does not deny the possibility that a researcher might discover a conception and construct a category of description from the evidence in only one transcript but he asserts the primacy of a pool of meanings based on collective experience.

It is from beyond its own research community that some of the more strident criticism of phenomenography has occurred. Richardson (1999), writing about phenomenographic research into learning, examines its concepts and methods from a number of different points of view and calls for a constructionist revision of phenomenographic research. Of particular concern to Richardson are the claims made by Marton and Booth (1997: 130-132) about the almost therapeutic role of the research interview, at least in studies of learning. For Richardson (1999: 68) these claims raise ethical and political issues especially in relation to the skills of the interviewer and the distribution of power in the situation of an interview. Richardson compares the analysis process in phenomenography with that in grounded theory pointing to strong similarities despite their bases in the different traditions of phenomenology and symbolic interactionism respectively. While both traditions have yet to resolve the dilemma of qualitative research, that is how to capture the subjective while at the same time meeting the requirements of science, phenomenography also has to resolve the tension between 'the positivist desire for scientific rigour and generalisability and the hermeneutical search for authentic understanding' (Richardson 1999: 72). Sandberg's approach to this tension is to address it in terms of phenomenological reduction. However, Richardson's concerns highlight the demands placed on qualitative researchers generally to assure quality at all stages of their studies.

Although his focus is also on phenomenographic research in learning, Webb's (1997) critique questions the orthodoxy that some of its outcomes have assumed in staff development programs in higher education, particularly in the binary deep/surface learning metaphor. In his spirited discussion of the shortcomings of phenomenography, Webb (1997: 197) makes a case for phenomenographic researchers to demonstrate the hermeneutical values of 'care and authentic openness'. He contrasts the processes of hermeneutical and phenomenography research and claims that 'the short-term, controlled and instrumentally directed interviews' of phenomenography, at least in learning, 'appear to be some way short' of the empathy required to enter the life world of the Other (Webb 1997: 197). Although the main points of Webb's critique are his deconstruction of the binary metaphor of deep/surface learning and his exposition of its limitations in illuminating the complexity of learning in higher education settings, the challenges that he presents to phenomenographic researchers cannot be overlooked.

Summary

This Chapter outlines the methodological boundaries of the thesis. The empirical study that advances the thesis demands a research approach that is consistent with a people-centred view of information use. The approach that is required should enable the exploration of the different relations between people and information as suggested by different perspectives on information. Phenomenography emerged as the most appropriate approach for the study because of its potential for revealing variation in people's experiences of information use and how they actually use information. Critiques of this approach have been considered and will be used in developing criteria by which the quality of the study can be evaluated. The conceptual and methodological frameworks for the study itself are outlined in Chapters 4 and 5 respectively.

Chapter 4

Conceptual framework of the study

This Chapter and the next, Chapter 5, focus on the empirical study that advances the thesis. Clear directions for contextualising the study of information use and adopting a people-centred orientation emerged from the theoretical location of the thesis in information science and is reflected in the research questions that are integral to the empirical study:

i. What are the different ways in which managers understand and experience information use?
ii. Is there a methodology appropriate to a people-centred view of information use?

Organisations provided the environment or setting for the study and the roles of managers in the organisations provided the context of their information use. The conceptual framework for the study is informed by the topics covered in this Chapter:

- information in organisations
- information use in organisations
- manager's information use.

Of necessity the conceptual framwork that is presented is loosely structured and serves more as a device for orienting the empirical study and the researcher to the phenomenon of information use as experienced by managers in organisations rather than as a prescription for the design of the empirical study.

Information in organisations

A brief discussion of information in organisations serves as an introduction to the conceptual framework of the empirical study by highlighting some areas of interest across the fields of information science, organisation theory and management and then placing the information continuum within organisations through reference mainly to the organisational theory and management literatures. Although there might be a common interest among scholars and researchers in these fields in the role and functions of information in organisations, evidence suggests that there is less interest shown in information science by organisational theorists and management scholars than there is interest shown in these fields by information science researchers and practitioners (Koenig and Srikantaiah 2002). This tendency on the part of management scholars is illustrated by a recent review paper on information seeking in organisations that cites only the empirical and theoretical literature of management and none of the literature of information science (Morrison 2002).

One indication of some commonality of interest emerged from a review of information concepts in the organisational theory and management literatures. Among the concepts identified as being common and therefore offering potential for research collaboration were: amount of information; extent of an information search; information overload; equivocality of information; uncertainty as an information trigger state; complexity and volatility in the environment as an influential information variable; and boundary spanning roles in organisations (Roberts and Clarke 1987: 86; Roberts and Clarke 1989). Clearly these concepts are relevant to information use.

Another indication of a commonality of interest is the view of organisations as information systems and the recognition that information processing is a major activity of organisations (Daft and Lengel 1986; Maguire *et al.* 1994). Choo (1991) examined two streams in organisation theory and research that adopted an information processing approach to organisations and highlighted the purpose of information processing in each stream:

> The decision-making perspective analyses organizations as rational decision-making systems. Unfortunately the individual decision-maker is bounded by cognitive limitations. The task of the organization is thus to control the decision premises that guide the members' behaviours. Information is processed in order to reduce and avoid uncertainty. The organisation sets its goals first, then searches for alternatives, and selects courses of action that lead to goal attainment.
>
> The enactment perspective analyses organizations as social, loosely coupled systems. Individual actors enact or create the environment to which the organisation then adapts. The task of organizing is to develop a shared interpretation of the environment and then to act on the basis of this interpretation. Information is then processed in order to reduce or resolve equivocality. Actions are taken first and then interpreted retrospectively: in other words actions can precede goals (Choo 1991: 46).

The decision making perspective with its focus on rationality, people's behaviours and a linear approach to decision making bears some similarity with an objective view of information or information-as-thing. The enactment perspective with its focus on interpretation, people constructing their own worlds and the fuzzy pathway to decisions resembles a subjective view of information or information-as-process and information-as-knowledge.

Information continuum

The continuum of data, information and knowledge is frequently invoked in the organisation theory and management literatures although inexplicably wisdom is often overlooked. Drucker (1988: 46), one of the early writers who addressed the impact of information and information technologies on organisations, implied the information continuum in his reference to 'information' as 'data endowed with relevance and purpose', based on a process that required knowledge. However not all writers make these distinctions and some use the terms 'data' and 'information' interchangeably (for example Larsen and Wetherbe 1999). This use of the terms is depicted by Mutch (1999: 536) as a ' blurring at both ends of the continuum'. He suggests that the pairings of data/information and information/knowledge rest on views of 'information as a resource' at one end and 'information as meaning' at the other.

The attention given to knowledge management has provided an impetus to clarify the differences between information and knowledge at both individual and organisational levels and the information continuum is useful for this purpose. For example, in their discussion of the nature of organisational knowledge, Tsoukas and Vladimirou (2001: 976-977) refer to the arrangement of data, information and knowledge on a single continuum 'depending on the extent to which they reflect human involvement with, and processing of, the reality at hand'. Davenport and Prusak (1998) also draw on the continuum in their approach to knowledge in organisations. They characterise data as 'a set of discrete, objective facts about an event' and describe it as 'structured records of transactions' (Davenport and Prusak 1998: 3). Information is regarded as '*a message*, usually in the form of a document or an audible or visible communication…meant to change the way the receiver perceives something'. In other words information has meaning. An important feature of information is that it is fluid in the sense that it 'moves around organizations through hard and soft networks' (Davenport and Prusak 1998:4). Knowledge is described as:

> …a fluid mix of framed experience, values, contextualised 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 organizations it often becomes embedded in organizational routines, processes, practices and norms (Davenport and Prusak 1998: 5).

Nonaka and Takeuchi (1995) challenge the culturally bounded notions of knowledge that have their origins in Western philosophy and focus on explicit and tacit knowledge in organisations, alluded to in the description given by Davenport and Prusak (1998). Comparing information and knowledge, they assert that:

> First, knowledge, unlike information, is about *beliefs* and *commitment*. Knowledge is a function of a particular stance, perspective, or intention. Second, knowledge, unlike information, is about *action*. It is always knowledge to "some end". And third, knowledge, like information, is about *meaning*. It is context-specific and relational (Nonaka and Takeuchi 1995, 58).

They also recognise that 'information' and 'knowledge' are used interchangeably and assert that information is necessary for the creation or construction of knowledge.

Central to the concept of knowledge creation in organisations are two types of knowledge that have their epistemic origins in the work of the philosopher Polanyi (1966). Tacit knowledge is 'personal, context-specific, and therefore hard to formalize and communicate' except through metaphor and analogy whereas explicit knowledge is 'transmittable in formal, systematic language' of the kind found in manuals and procedures (Nonaka and Takeuchi 1995: 58). Although it might be tempting to equate explicit knowledge with information, the point is made that information can be viewed from two perspectives. One is syntactic, referring to the volume of information, and the other is semantic, referring to the meaning of information. It is this latter perspective that underpins knowledge creation from the 'chaotic, equivocal sea of information' (Nonaka and Takeuchi 1995: 58). The process of knowledge creation recalls Dervin's sense making process, adding weight to the difference between information, at least from a semantic perspective, and explicit knowledge. Information then is not simply a message but rather a flow of messages and knowledge is created by that flow.

Nonaka and Takeuchi (1995: 61) make the point that tacit and explicit knowledge are not totally separate but are 'mutually complementary entities' that interact with each other and interchange through knowledge conversion, a social process between individuals as well as a process within individuals. Briefly there are four modes of conversion:

a. From tacit to tacit through socialisation, a process of sharing experiences

b. From tacit to explicit through externalisation, a process of articulating tacit knowledge into explicit concepts through metaphors, analogies, concepts, hypotheses or models
c. From explicit to explicit through combination, a process of systemising concepts into a knowledge system
d. From explicit to tacit through internalisation, a process of embodying explicit knowledge into tacit knowledge for example through learning by doing (based on Nonaka and Takeuchi 1995: 62-70).

The key to knowledge creation is the mode of externalisation because it creates new explicit concepts and theoretical knowledge. Paradoxically, this mode has been neglected in organisational theory in comparison to the other modes which have been addressed: socialisation through theories of group processing and organisational culture, combination through information processing and internalisation through organisational learning (Nonaka and Takeuchi 1995: 62). There are signs though that this imbalance is now being addressed with tacit knowledge being operationalised and becoming more amenable to empirical study (Ambrosini and Bowman 2001), with explorations of the links between organisational knowledge and individual knowledge (Tsoukas and Vladimirou 2001) and with models being developed that link individual and organisational learning with knowledge creation and sharing (Rowley 2001).

Further insights into information in organisations are presented by Abell and Winterman (1995b), experienced information practitioners and scholars. In their study of information culture and business performance they make several observations about information flow that are potentially significant for the empirical study. In organisations information flows in three ways: from the external environment into the organisation; from the organisation out into its external environment; and around the organisation (Itami as cited in Abell and Winterman 1995b: 5). External information is brought into the organisation and internal information is generated by the organisation as part of its processes and procedures or gathered from outside the organisation but reinterpreted for the organisation (Abell and Winterman 1995b: 5). The notion of information flow seems to assume that information is a resource, a commodity or an identifiable tangible object. Not surprisingly the scope of information is broad and includes information resources and information systems as well as their information 'contents' (Abell and Winterman 1995b: 5). These observations reinforce the view of organisations as information processing systems.

Information use in organisations

Information use in organisations is viewed in the literature from at least two perspectives: from an information perspective the organisation serves as an environment for information processes, from an organisation perspective information and its use contribute to organisational processes and sustainability. These perspectives are complementary as the following observation suggests:

> Perhaps we can better understand the uses of information in organisations if we see information, and decision-making, as part of an effort to comprehend and appreciate human existence as driven by elementary curiosity as much as by a hope for instrumental advantage. Information is not gathered in preparation for life. Gathering information is life. Moreover, this process of appreciation, of discovering, elaborating and communicating interpretations of events, is a pleasure (March and Sevón 1984, 102-103).

The topics elaborated in the discussion of information use in organisations and that depict a rich picture of information use are:

- an information perspective
- an organisation perspective
- typologies of information use in organisations
- factors facilitating information use in organisations.

An information perspective

Fundamental to Choo's (1998b) information perspective on information use in organisations is the notion of the knowing organisation. Such an organisation 'possesses information and knowledge so that it is well informed, mentally perceptive, and enlightened' (Choo 1998b: 4). The knowing organisation is enabled by three information processes: sense making, knowledge creation and decision making.

Sense making in the knowing organisation draws on the enactment model of organisations proposed by Weick (1995) and relies on resolving the equivocality of information by arriving at a common interpretation of the external environment. Knowledge creation draws on the knowledge conversion process proposed by Nonaka and Takeuchi (1995), a process oriented towards innovation and characteristic of learning organisations. Decision making is a predominantly rational and linear process (Simon 1976). This process has been the most influential in organisation theory and subject to study for many years but there are now some aspects of decision making that remain open to debate. In studying how decisions happen in organisations March (1997) sets out a cluster of contested issues each of which has implications for information use:

> The first issue is whether decisions are to be viewed as *choice-based* or *rule-based*...The second issue is whether decision making is typified more by *clarity and consistency* or by *ambiguity and inconsistency*…The third issue is whether decision making is an *instrumental* activity or an *interpretive* activity…The fourth issue is whether outcomes of decision processes are seen as primarily attributable to the actions of *autonomous actors* or to the systemic properties of an *interacting ecology* (March 1997: 10).

Choo (1998b: 17-18) asserts that the three information processes of sense making, knowledge creation and decision making are complementary and can be integrated into 'a continuous cycle of learning and adaptation'.

The theoretical framework for Choo's model of information behaviour in organisations is firmly anchored in the theoretical and empirical literature. The model proposes three dimensions of information behaviour: information needs, seeking and use. The model also proposes two dimensions of the environment for information seeking and use: the information processing environment that consists of the individual's cognitive needs and affective responses, and the information use environment that includes attributes such as organisational structure and work-related culture, that is the individual's work and social milieu (Choo 1998b: 40).

The five dimensions of Choo's model are informed by the information science literature. They draw on Dervin's (1992) approach to sense making as a gap bridging strategy (not to be confused with Weick's (1995) sense making as interpretation), the affective responses in Kuhlthau's (1993b) information search process and Taylor's (1986: 24) information use environments that consist of 'those elements that (a) affect the flow and use of information messages into, within and out of any definable entity; and (b) determine the criteria by which the value on information messages will be judged'. The elements of the information use environments can be grouped into four categories: sets of people, typical problems, work settings and problem resolution assumptions.

Information use for the purpose of the model of the knowing organisation is defined as:

> …the selection of relevant messages from the larger space of information encountered during a search, and the processing of the information so that it leads to a change in the state of the individual's knowledge or capacity to act (Choo 1998b: 41).

This definition is similar to that of Wilson's (2000a) in that it assumes a change in a person's knowledge but it extends Wilson's definition to include the possibility of action as a consequence of that change. It captures a sense of information use as both a process and an end-state in Todd's (1999b) terms and reinforces the dynamic nature of information use. It is this definition then that underlies information use in each of the information processes of sense making, knowledge creation and decision making.

While Choo's model illustrates each of the information behaviour dimensions of information needs, seeking and use it is the last of these dimensions that is germane to the thesis. Information use as it features in the three information processes in the model is summarised in Table 4 that follows.

Table 4

Information use in the knowing organisation[1]

	sense making	knowledge creation	decision making
Information use	• Reduce but not eliminate ambiguity • Build consensus or shared meanings for collective action	• Mobilise internal knowledge • Exploit external knowledge • Knowledge use as social process	• Limitations in human information processing • Structured by routines and rules • Many issues compete for attention

[1]based on Choo (1998b: 89, 140, 190)

It is clear from Table 4 that an information perspective on information use, at least in the knowing organisation, is broad in its scope. It encompasses doing something with information as well as understanding and interpreting life in general terms in the organisation.

An organisation perspective

This perspective on information use takes as its starting point organisation processes rather than information processes. The two studies selected to illustrate this perspective are framed around decision making and negotiating and both studies explore information use in the context of those processes. Rather than the holistic approach of the knowing organisation the studies of decision making and negotiating present selected aspects of organisational life.

Browne (1993) explored a single decision process by the governing body of an organisation over a five-year period. The use of information was traced through the meeting records of the governing body from the time the decision was recognised until it was no longer on the governing body's agenda. The outcome of the study was a model of decision making based on the testing of structured and anarchic models of this organisational process. Of the eight propositions that constituted the model seven referred to the decision process and one to information behaviour (Browne 1993: 187). Although this one proposition refers primarily to information use there are some indications of information need and information seeking behaviour in it. The proposition is presented in Figure 2 that follows.

Figure 2

Information use in decision making[1]

Proposition: Within the decision-making processes at the highest level of a higher education institution, decision-making groups in their information behaviour

- demonstrate constancy in screening, scanning and transmitting information, but with no particular pattern of occurrence;
- use information for general background and enlightenment during the decision process;
- use information to legitimise the decision process;
- do not use information gathered ostensibly for making a decision in the act of choice that leads to implementation of an alternative that resolves the problem or removes it from the agenda
- experience a generalised feeling of need for information;
- make few requests for information relative to the total amount of information received unsolicited;
- request that information gathered should be targeted to the problem at hand;
- ensure that information considered is authoritative;
- build on information already available in framing requests for more information;
- seek information not directly related to the identification and technical evaluation of alternatives;
- do not actively pursue information on other alternatives once an alternative has been implicitly or explicitly chosen;
- depend more often on information in written form than on information presented orally; and
- consider more summary, abstract information than impressionistic, concrete information.

[1] Based on Browne (1993: 187)

The picture of information use suggested in the proposition in Figure 2 is one of considerable complexity, which is to be expected given the high level of decision making in which the governing body engaged. Information use is depicted as involving different actions, having different outcomes, being cumulative in its effects and relying on different information media and forms.

The second example of an organisation perspective on information use lies in the development of a general theoretical model of negotiations. The model is organised around three aspects of negotiations:

i) problem definition or structuring the problem that in a win-win situation might involve making accessible not only explicit knowledge but also tacit knowledge
ii) information processes for the exchange of information and communication, analysis of information to bring about the desired outcome and consideration of information types
iii) and situation framing or establishing the value basis for each party in the negotiations (Johannessen *et al.* 1997: 156-158).

Information use is an element in all three aspects of negotiations but particularly so in the second aspect. The model is based on the propositions shown in Figure 3.

Figure 3

Information use in negotiation[1]

Problem definition or structuring the problem

Proposition 1: Interpretation of information in negotiations will be distorted on the basis of a need to sustain previous experiences, and may hinder or promote the win-win context to develop depending on these experiences.

Proposition 2: The more concrete the boundaries of the problem are defined and previous resolution propositions are analysed and the more explicitly we have indicated the consequences of these resolution propositions, the greater is the probability of transforming the win-lose context into a win-win context.

Proposition 3: The more the motives of the parties are displayed, the greater the possibility that we can transform a win-lose context into a win-win context.

Proposition 4: Systematic structuring promotes perspective insight between the parties, and a greater possibility that we can transform a win-lose context to a win-win context.

Information processes for the exchange of information and communication

Proposition 5: The greater the exchange of information between the parties, the greater the probability for a win-lose context being transformed to a win-win context.

Proposition 6: When in negotiations we have stipulated a target and realise that it cannot be reached, we still have a tendency to cling to the original target, which may hinder the transformation of a win-lose context to a win-win context.

Proposition 7: The more effectively we manage to transmit correct information that is emotionally interesting, concrete, provocative and close to us in time and space, the greater is the probability of the information receiving high cognitive authority, and the greater the possibility that we can transform a win-lose context into a win-win context.

Situation framing or establishing the value basis for each party

Proposition 8: The more information we get about the value system of the other party, the greater is the probability that we can transform a win-lose context to a win-win context.

Proposition 9: The more the parties succeed in developing positive emotions, the more information exchange between the parties will ensue, and the greater is the probability for developing a win-win context.

Proposition 10: The more we frame the problem making it seem as if escaping losses is the main thing, the greater is the probability that aggressive behaviour is triggered, and the lower is the probability to transform a win-lose context to a win-win context.

Proposition 10A: The more we frame the problem making it seem as if profit is the ultimate goal, the greater is the probability that defensive behaviour is triggered, and the higher is the probability to transform a win-lose context to a win-win context.

[1] Based on Johannessen, Olaisen and Olssen (1997: 156-158)

The model shown in Figure 3 was proposed as a basis for information management during the negotiation process. Although there is no clear delineation of information behaviour in terms of information need, seeking and use some of the propositions refer implicitly to information use.

The two examples of an organisation perspective reveal the complexity of information use in organisations. They suggest that information use involves more than engaging in organisation processes. In the first example decision making went beyond simply exercising a choice among alternatives and in the second the negotiation involved more than reaching agreement with a partner organisation.

The information and organisation perspectives on information use are to a large extent mutually reinforcing. The broad sweep of information use in organisations is also alluded to in the images that are used to describe organisations: machines, organisms, political systems, cultures and learners (Kirk 1999). Information use in organisations can be interpreted as keeping the wheels turning, maintaining an equilibrium or adapting to change, exercising influence and negotiating conflict, reflecting and sharing beliefs and values and creating and sharing knowledge. These interpretations are consistent with the two different perspectives on information use that have been illustrated by reference to the theoretical and empirical literature on information use in organisations.

Typologies of information use in organisations

Two typologies of information use in organisations that have been developed by organisation and management researchers illustrate the interconnections between some of the theoretical concerns in different fields and serve to link the conceptual framework of the empirical study with the broader theoretical location of the thesis. One of the typologies comes from the information utilisation literature, the other from the literature on decision making. The industries and sectors from which the typologies emerge are varied but together they demonstrate the variability of information use in organizations as described by researchers from different disciplinary perspectives.

An information utilisation typology

Although developed over twenty years ago, the typology developed from the information utilisation literature has been found to be relevant still to information use in organisations. The veracity of the modes of information use in this typology is in fact enhanced by its application in different organisations over time. Beyer and Trice (1982) examined the use of organisational research and concluded that the modes of instrumental, conceptual and symbolic use were appropriate in an organisational context. They caution against generalising the findings from the utilisation of social science research on the basis of the different populations studied and the measures used. For example, they point out that in one of Weiss's (1980) studies she found little evidence of instrumental use among mental health administrators. Yet a study by Alkins and his colleagues (1974) found greater use of instrumental use among local administrators than among federal-level administrators (cited in Beyer and Trice 1982: 599). In relation to symbolic use, an area 'plagued by special difficulties' the point is made that some uses are 'benign' although others might not be so (Beyer and Trice 1982: 601).

Moving away from the utilisation of social science research, Pelz's (1978) modes of information use have application more generally as demonstrated in two studies from the management literature. One study, based on the use of export information in firms, linked different export decisions to different modes of information use with strategic decisions based on conceptual use and tactical decisions on instrumental or symbolic use (Diamantopoulos and Souchon 1996: 133). Other findings from the study were that:

- instrumental utilisation is more effective when there is a high level of trust between information providers and information users
- internal or personal information is more likely to be used immediately whereas information from external sources is likely to need interpreting and evaluating before it is used
- conceptual use was based on information from subscription services, unsolicited information from similar firms abroad and information in company libraries but regular contact with customers is the preferred way of 'keeping up' interactions with customers
- symbolic use occurred when a decision had been based on intuition and instinct and in this instance it was the individuals' expert experience rather than the firm's that led to heightened levels of symbolic use of information (based on Diamantopoulos and Souchon 1996: 127-133).

Another study, based on new product development, suggested a link between modes of information use and an internal environment characterised by rivalries among functional units in organisations. In this environment there is a risk that the research and development managers' perceptions of the quality of internal information will be reduced, resulting in lower levels of instrumental use of information and impairing the implementation phase of new product development (Maltz, Souder and Kumar 2001). However, conceptual use of information is likely to increase as managers change their views on the marketplace or the organisation and assist in the planning phase of new product development (Maltz, Souder and Kumar 2001: 79).

A decision making typology

A different approach to information use in organisations is suggested by decision making research. Taking the literature on decision theory and research as their starting points, Feldman and March (1981) presented a series of observations on information use that led them to suggest that information is used as both a signal and a symbol. Noting a dissonance between decision theory and actual decision making, they reported that:

> Most organisations and individuals often collect more information than they use or can reasonably expect to use in the making of decisions. At the same time, they appear to be constantly needing or requesting more information, or complaining about inadequacies in information (Feldman and March 1981: 174).

This dissonance is explained by the relative social and individual importance of decision makers. Organisational decisions reflect social and organisational values and offer opportunities for demonstrating appropriate behaviour. In discussing information as a symbol, Feldman and March (1981: 177-178) referred to the 'ritualistic reassurance' of sound decision making that information gathering and use provided and the confidence inspired through the command of information. The rituals of decision making also established a shared interpretation of reality and gave meaning to organisational life as well as reinforced the basis of decisions in intelligent action:

> Using information, asking for information, and justifying decisions in terms of information have all come to be significant ways in which we symbolise that the process is legitimate, that we are good decision makers and that our organisations are well managed (Feldman and March 1981: 178).

Decisions that are legitimate are information-intensive in the making and information is a sign of that legitimacy. The use of information to symbolise a commitment to rational choice is one explanation for the apparent over-consumption of information (Feldman and March (1981: 182). Other explanations are offered, for example that much information in organisations is gathered in surveillance mode rather than for decision making and that information in organisations is subject to misrepresentation.

These two typologies of information use in organisations suggest that the empirical study might reveal different modes of information use, although what those might be remains uncertain. They also attest to the social and cultural environment in which information use occurs in organisations and support the choice of phenomenography as a research approach appropriate to a holistic view of information use.

Factors supporting information use in organisation

Mintzberg (1974) asked the question: why do managers not use information as they apparently should? The domains into which the answers fell were information, the organisation and human factors. Although the question was asked in relation to management information systems, the literature indicates that the domains are pertinent more generally. The factors that enhance information use as they relate to organisations rather than individuals in those organisations in organisations are embraced in the following topics:

- the information domain
- the organisation domain
- the human factors domain.

The information domain

In the information domain the factors supporting information use are related directly to the scope and quality of information. Mintzberg's (1974) comparison of formal information systems such as computer based management information systems and informal systems such as telephone and face-to-face conversations provides a useful background for the consideration of the scope and quality of information. The points of comparison selected by Mintzberg (1974: 2-8) suggest that considerations of information use in organisations might include:

- the complementarity of formal and informal information systems. Informal systems offer data that is less limited in the sense that it is contextualised, goes beyond quantitative data, often carries with it the non-verbal vitality missing from documents and offers immediate feedback. Formal systems are sometimes weak on external information although this is dependent on the role and function of information centres, such as corporate libraries, in organisations.

- aggregation of data. Filtering mechanisms need to be sufficiently intelligible to ensure that the formal system is capable of delivering information to the level of specificity required. It should be noted that formal information systems are designed to aggregate data as a way of avoiding overloading managers with information. Paradoxically the solution of aggregation developed by system designers leads to a level of generality that sometimes renders the information unusable, or at least suspect.

- timeliness. Formal information systems that rely on scheduling of reports, aggregation of data and verification are neither as fast nor as selective as informal information systems.

- reliability of data. The information provided by formal information systems is not always reliable and there are questions about the cost of ensuring reliability through effective surrogates and measures.

Scope of information

The characteristics of information referred to by Mintzberg (1974) in his comparison of information systems are still evident and emerged from a recent study of the use of management accounting information in organisations. In order to orient managers to decision making and provide them with some insights, management accounting information should respect deadlines, contain sufficient detail, and be reliable as well as exhaustive (Mendoza and Bescos 2001: 258-259). Aggregation and other processes inherent in providing information through formal information systems threaten some of these characteristics. Because managers needed to be informed as quickly as possible they developed their own data collection strategies based on their observations, informal reports and informal networks of contacts (Mendoza and Bescos 2001: 279). Managers sometimes found non-financial indicators more useful than financial indicators in diagnosing a situation. Information provided by informal information systems seems to be more timely and detailed than information provided by formal information systems although it might be less reliable.

There is an additional dimension to considerations of the timeliness of information apart from the delivery of information at the point of need and currency. Information use itself takes time. In a study of the decisions made by local mental health organisations to use specific information Larsen (1985: p.149-150) identified seven categories of decisions regarding the use or non–use of information: information considered and rejected, nothing done, information under consideration, steps taken toward use, information partially used, information used as presented, information used and adapted to the needs of the person using it. Although some organisations were in the process of making decisions about using information eight months after it was presented most had made decisions by this time. Information that was judged easy to use is more likely to be completely used and in a shorter period of time than information that needs adapting to the organisation's needs (Larsen 1985: 156).

Processes for ensuring the effective use of information in organisations from the point of view of information professionals have been addressed in the literature. For example, McLaughlin and McLaughlin (1989) have warned that unless certain activities are managed the use of information in organisations will be impeded. The activities are guided by the organisation's mission and purpose and include the selection, capture, manipulation and delivery of information. Unfortunately reflecting the stance of some information professionals a judgement is passed on 'questionable behavior [that] can also arise when excessive information is used in an attempt to mask a gap in some decision maker's logic…or to counter an external threat to the organisation' (McLaughlin and McLaughlin 1989: 28). From the stance of decision makers however this 'questionable behaviour' is reasonable. In Browne's (1993) study of organisational decision making it was demonstrated by the organisation's governing body in response to a call made by an external group to reduce staff numbers. The behaviour also exemplifies the rituals of wise decision making.

Quality of information

In addition to the scope of information its quality is also a factor that enhances the use of information in organisations. Although it is sometimes difficult to distinguish between the scope and quality of information timeliness and reliability might be regarded more as indicators of quality of information. Distortion of information, whether deliberate or not, is also an aspect of the quality of information. Different types of distortion that have been reported include:

- good news syndrome where good news circulates quickly and bad news is suppressed
- exaggeration in situations where organisational units are competing for funding, kudos or reward
- groupthink which can have the effect of silencing contrary views and opinions (Butcher 1998: 9-10).

These types of distortion suggest that the social and political milieu of an organisation is likely to be significant in information use. For this reason some of the strategies for overcoming information distortion, such as ensuring transparency in decision making, are concerned more with the organisation than with information itself.

The organisation domain

The organisation domain shifts attention from information itself to the environment and context of its use. Two factors that are significant in facilitating the use of information are information culture and information flow in organisations. Again the work of Mintzberg provides a useful background for the discussion of these two factors. Mintzberg (1974: 8-12) wrote of the following aspects of the organisation domain:

- adaptable organisational objectives and appropriate measures of organisational performance. When the objectives of the organisation are shared by the people that constitute it then information use is likely to be enhanced and the knowledge that is created is more likely to be shared. Wilson (1995: 3) asserts that in those instances where the aims and objectives of individuals and organisations do not coincide people might feel less inclined to communicate with others and use information and communication systems. Synergy among the objectives of individuals and the organisation is of course dependent on those objectives being made explicit.

- political situation and power relationships within the organisation. Shared or common objectives are also relevant here so that potential for the distortion of information is minimised and credibility of information is enhanced. This point has been described in relation to the quality of information used but the political realities of organisations have a place in information use.

- recognition of the nature of managerial work. The preference for current, action oriented information by managers depends heavily on informal channels for its exchange and so communication is a factor in information use. Managerial work is characterised not only by oral communication but also by interruptions. There is a risk that important information of the kind that is documented and requires time for reading and reflection will be overlooked.

These aspects are limited by their origins in Mintzberg's (1974) analysis of the use of management information systems but they offer a perspective on the broader human and social environment that surrounds information use in organisations.

Information culture

A similar broad perspective was adopted by Horton (1987) in his analysis of the impact of information management on organisational culture and extended by Orna (1999) in her guidelines for the development of information policies in organisations. Interest in organisational culture and its relation to information management practice is also evident among management practitioners. For example Norton (1994) offers a choice to information managers in putting either people or information systems first and concludes that an ideal working culture might be one where the interactions between people and information systems reflect the values and beliefs of an organisation. He gives very strong endorsement to Orna's 'people-centred, task analysis approach' (Norton 1994: 176).

The social and cultural aspects of information behaviour in organisations have been captured in such phrases as 'information culture' and 'information ethos' and explored by information science researchers. Ginman (1988) identified factors determining information culture in a business environment. Based on interviews with Chief Executive Officers (CEOs) she investigated the characteristics of selected companies, personal characteristics of CEOs and the CEOs' approaches to information. The study concluded that a 'highly developed information culture correlated positively with successful business performance' and made the point that strategic planning in organisations must take account not only of material resources but also intellectual resources and allow for the transformations of each of these sets of resources (Ginman 1988: 104).

The links among business culture, information culture and business performance have also been established by others. Abell and Winterman (1995b) confirmed the significance of information culture by suggesting that corporate culture is created through the transfer of information. This suggestion is based on the work of Vincent (1984) who advances the propositions that human and organisational behaviour are a direct result of acquired knowledge and that knowledge is a result of information transfer (cited in Abell and Winterman 1995b: 7). In this sense information transfer involves communication so that knowledge can be created and shared. Some of the salient features of an information culture are:

- an acceptance of information as a valuable organisational asset
- a belief that the creation of an information ethos or culture is an important step towards ensuring continued success
- the creation of an information ethos as part of an ongoing process of change management, partly initiated by the widespread introduction of information technology into the workplace
- the backing and leadership of senior managers and the CEO in particular in those companies that have successfully implemented change and created and information ethos (Owens *et al* 1997: 25).

Three case studies can be cited to provide further insight into the characteristics of an information culture that supports effective business performance. The studies also highlight the challenges facing organisations in developing productive information cultures. The first case study is based on industrial firms, the second on the insurance industry in Finland and the third on textile and clothing firms in Great Britain.

Although not using the term 'information culture' as such Olson (1977) identified the organisational aspects of industrial firms that might affect the use of scientific and technical information. Among the aspects were: the mission of the organisation; its structure; management processes in relation to planning, information sharing, decision making, authority and power and leadership style; personnel; social system and organisational climate. The study proposed that an open organisation is one that is most conducive to information use and the flow of information within and outside the organisation. Although none of the companies studied were completely open, areas for attention were identified and these included changing the management philosophy, improving interpersonal relations in work groups and increasing the perceived value of information services. In the study information use was taken to mean 'reading of journals, attendance at professional or trade meetings, papers published, literature searches, visits to and from colleagues, telephone calls and use of secondary information sources' (Olson 1977: 4).

A case study of companies in the Finnish insurance industry is still in progress but it suggests that a positive and successful information culture is one that supports flexibility, identifies common values, supports collaborative learning and education and training (Widén-Wulff 2000) Such a culture is marked more by openness than closure and embraces organisational and individual attitudes and values towards information, social intelligence, formal and informal information and communication systems as well as information ethics.

A study of the British clothing and textile industry matched an ideal corporate culture with observations made in fieldwork (Abell and Winterman 1995a: 51). The successful firms were characterised by adaptive cultures and were concerned with such issues as relationships with their suppliers, flatter structures, relations with employees, training and staff development, quality assurance and continuous improvement, impact on the environment, and the use of information technology (Abell and Winterman 1995a: 52-53). Some of these characteristics are similar to the indicators of a positive information environment developed in the Finnish insurance industry case study.

While all the companies in the British case study attributed their success to the use of information and they used and managed their internal information well, little recognition was extended to the value of external information other than client and supplier information. External information had no separate identity and its collection and evaluation was regarded as a matter for individual employees rather than integrated into a holistic approach by firms to information (Abell and Winterman 1995a). A similar view on external information was also found in an earlier study of British manufacturing organisations (White 1986).

These three case studies link openness and flexibility with a productive information culture and take both organisational and individual information behaviour and use into account. The integration of information into business processes in seen to be significant along with people's awareness and acceptance of the value of information to firms. The structure of organisations and the flow of information through them are also seen to be a factor in an effective information culture.

In addition to the rituals, values, processes and resources that surround information, the information culture of an organisation also finds expression in its information products or 'the visible products, print on paper or electronic, through which information is presented for use' (Orna 2001: 302). Recalling the information consolidation process and its function in supporting technology transfer and subsequent social change in developing countries (Saracevic 1986) similar claims are made for information products that are:

> …the end result of the series of transformations of knowledge into information; they also become the starting point of transformation in the other direction on the part of their users, who seek to transform what they require of the information contained in them into knowledge and integrate it into their existing knowledge structure. These transformations form the basis of all human learning and communication: they allow ideas to spread across space and time, and link past and present in a network that embraces generations and cultures over millennia. By virtue of that quality, they are also fundamental to the working of organisations of all kinds (Orna 2001: 302).

As cultural artefacts information products express and communicate the values of an organisation both internally and externally. Interest in the process of transforming information and knowledge along the lines outlined by Orna (2001) has also captured the attention of those who argue that knowledge is *the* resource that is fundamental to the development and performance of organisations and their business. Bonaventura (1997: 84) wrote of a knowledge culture and argued that documents, including multimedia objects produced through analytic processes at the intelligent desktop, are the most important traces of an organisation's knowledge processes and so they need to be disseminated in ways that enable the knowledge and best practice embodied in them to be used and re-used.

The structure of an organisation is also part of its culture and has been identified as an element in the information cultures in the case studies discussed. Flatter structures and team based organisations are likely to foster information transfer and interactions of the kind that facilitate information use. White's (1986: 169) study reported that in organisations with flatter pyramid structures middle managers felt they had access to strategic information and operational data through close personal contact with senior managers and the shop floor. They reported feeling happier with the supply of information than their counterparts in organisations structured on a deep pyramid characterised by information reported up to and used by senior managers as much for the exercise of control as for information sharing.

Information flow

Integral to an information culture that values information sharing is the notion of information flow. This is becoming an increasingly vital factor in business success and sustainability. The complexity of information flow is perhaps most clearly captured in the image of the organisation as an organism maintaining equilibrium within its constantly changing ecology. The free flow of information within the organisation and between the organisation and its external environment is essential to its well being and its long term survival, a situation acknowledged by most managers in a survey carried out almost ten years ago (Reuters 1994).

The literature on information flow distinguishes between formal and informal information flows and likens them to communication channels. Fleck (1996: 105) asserts that informal channels that are 'rich in data and nuances of value' are an essential supplement to the 'abstracted and restricted formal channels' in organisations. Macdonald (1996: 220) offers a simpler distinction in his consideration of information required for the formulation of strategy: formal information flow is arranged by the organisation and informal information flow is not. Because formal information flow is not able to provide all the information that is required, informal information flow along channels not provided by the organisation overcomes the limitations of the formal channels. Macdonald (1996: 221) emphasises the point that large organisations are well suited to carrying familiar, codified information flowing 'in a regular format from expected sources to determined destinations along established channels'. However, this is not necessarily the new information from which strategy and change are formulated and it might fit uncomfortably with information already in use. Formal and informal information flows are complementary, one well within the control of the organisation and the other well beyond it.

The formal/informal dichotomy of information and information flow is not universally accepted. Grosser (1991: 354) suggests that the dichotomy is an overly simplistic view of the interdependent and 'inextricably intertwined' formal and informal networks in organisations. Lievrouw and Finn (1996) have challenged the dichotomy on the grounds of its misrepresentation of the complexities of information flow and communication in organisations. They argue convincingly that newer information and communication technologies such as fax, voicemail and email, are creating new information environments for organisations that are characterised by higher levels of informality. Whether or not an information flow is formal or informal depends more on the intersection of the broad social context of information exchange, the participants' perceptions of the information exchange and the information environment of the organisation than on the kinds of messages or information that are conveyed by either channel for information flow. It is clear that information flows are highly contingent and dynamic.

The trend towards informality in information flow can be summarised as a shift from an informing information environment to an involving information environment that is supported by developments in information and communication technologies (Lievrouw and Finn 1996: 36-37). The informing information environment relies on conventional one-way technologies and is associated with a hierarchical, linear culture characterised by more impersonal relationships. By contrast the involving information environment relies on new interactive N-way technologies associated with a non-linear reflexive culture characterised by more personal relationships (Lievrouw and Finn 1996). This analysis presents a multidimensional rationale for increasing levels of informality in information flows in organisations, at least those that are information and communication technology-intensive.

A study of information flow in the strategic planning process in UK retail banks highlights some of the changes described by Lievrouw and Finn (1996). The move of strategy formulation from corporate headquarters to business units has resulted in an evolving involving information environment with some of the consequences foreshadowed by Lievrouw and Finn (1996) now evident. The application of performance measurement models such as the balanced scorecard and business excellence models have enabled some of the retail banks to provide focused information, share information across functional units and identify gaps in organisational information and knowledge (Broady-Preston and Hayward (1998: 401-402). There were some barriers to information flow revealed in the study but they were by no means experienced by all the banks surveyed. Among the barriers were: reservations about sharing information across the organisation, price sensitivity of some information and the need for confidentiality and security, lack of agreed definitions in management information and data sets, disparate databases rather than a corporate database, the lack of a context provided with data and information, and concerns about the quality of information and the credibility of sources (Broady-Preston and Hayward 1998: 404-406).

In an extensive description of barriers to information flow in organisations, Butcher (1998) refers to several different sets of impediments. Three of these, organisational politics, little coordination of effort in information collection, and communication problems, are related in part to information culture. The two remaining sets of impediments, the inappropriateness of information systems and the distortion of information, are related more to information itself. The barriers, with the exception of information distortion that has been discussed already in terms of the quality of information, are described in more detail in Figure 4 that follows. These barriers provide a comprehensive picture of the features of organisations that facilitate information use in organisations.

Figure 4

Barriers to information flow in organisations[1]

Organisational politics especially in relation to the hoarding of information and the use of new or irregular information that might be overlooked because of the demands it makes on people to consider it.

Lack of coordination of effort especially in organisations with flatter structures. Some of the problems that occur include the duplication of time and effort in collecting and storing information, missing opportunities by not using information already available in the organisation and the failure of individuals and units to collect and transfer information that might be of use to others. When coordination involves mapping the information resources of the organisation, encouraging organisation-wide information awareness and strategic planning with a focus on the external environment then some of these problems are more likely to be resolved.

Inappropriate organisational information systems from libraries and information units to electronic information systems and Intranets. Problems cited relate to the purpose of these systems, their usability, the quality of the data and information they collect and provide.

Communication barriers that arise in one-way, two-way and horizontal communication. Some of the variables that can interrupt the flow of information are related to the characteristics of the organisation (status and title of those involved in an information exchange, the number and nature of levels through which messages cascade, physical location of people in relation to corporate units, information and communications technology and media), and others to characteristics of information exchanges (language barriers, perception barriers, presentation of messages and the design of information products, timing of messages and information exchanges).

Based on Butcher (1998: 8-9, 11-21)

The human factors domain

Mintzberg (1974: 12-17) referred to three human factors in this domain: cognitive limitations on human information processing; filtering mechanisms of the brain that reject potentially relevant information; and the filtering of potentially threatening information by the human brain. To the extent that these factors have an organisation dimension they are discussed here but they are also germane to the discussion of manager's information use.

Before considering the consequences of cognitive limitations on human information processing it must be emphasised that the literature explores these limitations most frequently in the context of decision making at the level of either the individual or the organisation. Decision making is a complex and contested concept and process and a detailed analysis of the different approaches to decision theory is beyond the scope of this thesis. There are clear signs that the long established predominance of rational models of decision making are under challenge by those calling for consideration of affective involvement and value commitments in decision making (Etzioni 1992; Zey 1992). Approaches that rest on the political dimensions of decision making are also being challenged, and so too are the anarchic approaches derived from the garbage can model (for example Feldman 1988; Eisenhardt and Zbaracki 1992).

The focus appears to be moving from decision making as the exercise of choice to decision making as an intuitive process along with the conceptualisation of decisions as a human construct revealed through organisational narrative (O'Connor 1997; Sauter 1999). The uncertain and fluid state of decision theory and research is perhaps typified in the following statement:

> As researchers, we may all be acutely aware of the boundedness of cerebral rationality. But that does not justify us in promoting methods that deny the existence of ambiguity, insight, intuition. Decision making is prospective, introspective, retrospective, sporadically rational, ultimately affective, and altogether imaginatively unbounded…today's conceptual world of organizational decision making looks awfully

> black and white. Is it not time to open it to the rich world of color? (Langley *et al.* 1995: 277)

A significant aspect of the limitations of human information processing as they impinge on organisations is information overload. Based on studies in cognitive psychology, and specifically the work of Miller who isolated the capacity of short term memory to deal with only about seven 'chunks' of information at a time, Mintzberg (1974:13) identified information overload as a problem. Although the seriousness of information overload has been disputed, the phenomenon has been recognised for a considerable time (Tildine 1999: Bawden *et al.* 1999). Much less frequently studied is its obverse, information underload (O'Reilly 1980: 684).

Information overload

A recent review of the literature on information overload refers to related terms such as 'infoglut', 'data smog', 'analysis paralysis' and 'information fatigue syndrome' and concedes that there is no agreed definition of the phenomenon or concept (Edmunds and Morris 2000: 18). There are though a couple of meanings attributed to the term: 'having more relevant information than one can assimilate' and 'being burdened with a large supply of unsolicited information, some of which may be relevant' (Butcher 1998: 53).

There appear to be two factors contributing to information overload (Bawden *et al.* 1999: 251-252). The first is the increasing quantity of internal and external information that is available and accessible. This is largely a matter of information provision that is increasingly reliant on information and communication technologies as both a delivery and filtering mechanism. It is these technologies that have created convenient access to information especially by end-users, including people in organisations, and enabled the delivery of large amounts of information to desktops primarily through email. The second factor is the increasing diversity of information, for example figures, text, ratios, graphics and charts, and of information formats, for example reports, web pages, and voicemail.

This diversity also extends to the perspectives from which information is presented. Interdisciplinary work illustrates the complexity of information that might be needed in an organisation and the intellectual agility demanded of people working within different cognitive frameworks (Wilson 1996).

The effect of information overload is that people are no longer able to use information effectively (Feather 1998: 118), a situation that causes distraction, creates stress, increases errors (Klapp 1996) and even endangers health (Reuters 1996). In organisational terms there are inefficiencies and costs associated with information overload as well as the risk that relevant information will be overlooked and remain unused (Bawden *et al.* 1999). An increase in information diversity has been shown to have an adverse impact on decision making (Iselin 1988; Iselin 1989; Iselin 1990) and this has been confirmed to be the case generally for information load, both overload and underload (Hwang and Lin 1999). It seems that there is an optimal amount and diversity of information that is related to the efficiency and effectiveness of decision making but as yet there is little certainty about the scope and scale of the optimal level of information.

Central to the problem of information overload is the paradox that there is an abundance of information yet a scarcity of useful information. Remedies for the problems generated by information overload are centred on restoring control over information or at least regaining a sense of purpose in using it (Bawden *et al.* 1999). From another point of view, Butcher (1998: 54) suggests that most of the explanations of information overload are based on fear. A sense of control is one way of overcoming fear and its related stresses and anxieties.

Minimising information overload

The strategies for gaining control over information that have an organisational dimension include reducing the amount or quantity of information that is available to people in an organisation, processing information to emphasise its potential relevance to organisational tasks and enhancing the information handling capabilities of an organisation. These strategies rely on improving the quality of information and the presentation of information that is made available to people in organisations.

Reducing the availability of information

There are several different ways of reducing the amount of information that is available. Information based programs or activities such as environmental scanning can be reduced in scope and scale and the channels through which information is disseminated can be limited by distributing information on a need-to-know basis or filtering information through an information and research unit (Butcher 1998: 55-56). There are also some technology based approaches to limiting the availability of information. For example 'push' technologies rely on user profiles in searching selected information sources for information and transmit available information at regular intervals (Herther 1998).

There is a need for caution though in implementing solutions based on reducing the amount of information available. Butcher (1998: 56) refers to the risks of making available inadequate information or making available information that is relevant only to individuals engaged in particular organisational tasks. While push technologies are still being developed there remains the potential for them to exacerbate the problem of information overload in those instances where the information they deliver has little relevance or value to the organisation or individuals (Edmunds and Morris 2000: 24). Reducing the amount of information, irrespective of the mechanism or technique used, reduces the opportunities for the accidental discovery of information through information encountering in activities such as browsing and environmental scanning (Erdelez 1997).

Processing of information

Approaches that involve the processing of information itself are directed towards adding value to information as a way of reducing overload. Taylor (1986: 50) identifies processes that can be used in information systems to enhance the value of information. These processes increase the ease of system use, reduce noise in information retrieved, increase the quality of information, adapt the information retrieved to a specified kind of problem, save time and save costs. In terms of information overload considerations of noise and quality are perhaps the most pertinent. Examples of system processes that reduce noise include indexing, vocabulary control and filtering. Although intelligent search agents and interfaces now offer considerable potential there is the possibility that such solutions might in fact add to information overload (Edmunds and Morris 2000). While further research and development is likely to improve the reliability of these system based solutions they are likely to extend and refine the processes identified by Taylor (1986) rather than add to them.

Information system processes that increase the quality of information include editing, updating, analysing and comparing data. The quality criteria for information used by Taylor (1986) are accuracy, comprehensiveness, currency, reliability and validity. Some of these criteria are amenable to manipulation by information systems but what is not possible, at least in the short term, is the capacity of information systems to tailor the criteria for information quality to particular organisational problems and tasks and match information to those problems and tasks.

Starting from the premise that information overload represents a failure of organisations to understand the value of high quality information to their business, Simpson and Prusak (1995: 415-417) articulate five elements of value in information to profit-making organisations in a competitive market: truth, scarcity, guidance, accessibility and weight as perceived by the person using information. Various processes associated with each element can be used to increase the value of information to those who use it and at the same time reduce information overload. Some of the processes are functions of information systems, others of the social and cultural interactions that occur inside and outside organisations.

The importance of information presentation in reducing information overload and its adverse effects has been investigated in a number of studies. Roberts and Clarke (1989: 29) concluded that the delivery and presentation of information could assist people to sort the significant from the insignificant and the relevant from the irrelevant. Hwang and Lin (1999) recommended the use of techniques such as aggregation and summation to reduce the diversity and repetitiveness of information that is made available. This study built on previous studies of the prediction accuracy of bankruptcy from sets of financial ratios that demonstrated that information overload has an adverse effect on decision quality (Iselin 1988; Iselin 1989). A study of the use of graphs in presenting information confirmed that information overload affects decision quality related to simple financial trends but the mode of presentation alone does not affect decision quality (Chan 2001).

A novel suggestion for reducing information overload in electronic environments is offered by Weick (1985). He argues that from a sense making perspective confinement to a terminal rather than an oversupply of information is the problem for the reason that overload occurs 'when you get too much of the same kind of information' (Weick 1985: 63). The solution to the problem lies not so much in the presentation of information, nor in reducing the amount of information available but in increasing the kinds of information that are used so that comparisons can be made and meaning created. Information processing then would be directed more to increasing the diversity of information.

Information handling capabilities

The third approach to reducing information overload is concerned with the information handling capabilities of organisations and the extent to which their information infrastructure supports information use. This infrastructure extends beyond information channels to include information policies, processes and technologies.

Orna (1999) suggests that an information policy is a key factor in integrating information into the strategic and business processes of an organisation. High level information policy provides a framework for decision making about information handling by an organisation including priorities for resolving information problems such as information overload. At a more operational level, information policies can be developed for particular information issues, for example the considerate use of email (Bawden *et al.* 1999: 254).

In terms of information handling there are information processes that are pertinent at an organisational level. Information literacy, or the 'ability to access, evaluate and use information from a variety of sources' (Doyle as cited in Bawden *et al.* 1999: 253) is a concept usually aligned with the information capability of individuals. However, it has an organisational dimension made explicit through the value placed on information creation and sharing in an organisation. Among the organisational processes identified by Bruce (1999b: 43) as being related to information literacy are environmental scanning, the provision of internal and external information resources, the packaging of information for internal and external use, records and archives management, capturing the corporate memory, supporting research and development and promoting codes of conduct in relation to information. Processes such as these support the construction of information and the creation of knowledge and are vital in the development of the 'learning' organisation (Mutch 1997). The information processes and the value surrounding information should be consistent with an organisation's information policy and its information culture.

The communication and information technologies that underpin an organisation are also a key part of its information infrastructure. Arguing that the root cause of information overload is not so much the amount of information but more the lack of structure of information, Königer and Janowitz (1995) point to the impact brought about by advances in information technology. In an electronic environment information becomes disintermediated as the connections between information, its carrier and its medium are lost. The cues that might have supported information use, such as the layout of a page, the quality of paper, the ordering of text and even the binding of a report or a book, have disappeared. Königer and Janowitz (1995) propose a solution that addresses four dimensions of information structure: selection, time as it relates to the life span of information, hierarchy in relation to quality and detail and sequence. This solution suggests some of the information processes that might be put in place as well as some of the technologies that would support the work of people who are competent information users.

The complexity of information and its use in organisations is evident. The literature that has been reviewed contributes to the conceptual framework of the study by addressing some of the key concerns and issues in the information environment where managers enact their working lives. The analysis of the literature also justifies the selection of organisations as an appropriate environment for the empirical study of information use.

Managers' information use

The analysis of the literature of information science, organisation theory and management established that organisations provide a fruitful environment for the study of information use and an exploration of some of the information, organisation and human factors that shape influence use. Information use is also shaped by people's information behaviour and in the environment of organisations by their social and work roles as well as by their personal attributes (Wilson 1981; Wilson 1997). The topics covered in the analysis of the literature that is relevant to managers' information use are:

- the role of managers
- information and the role of managers
- information and managers.

Information use is embedded in the social and cultural life of organisations. According to Choo (1998a) information use might result in the making of a decision or the making of meaning. In any event the use of information is 'a social process of inquiry that is fluid, reciprocal and iterative' (Choo 1998a: 50). Information use is predominantly a process, the outcome of which is 'a change in the individual's state of knowledge and capacity to act' (Choo 1998b: 62). Browne's (1993: 221) study also demonstrated that information use is predominantly a process and observed that not only do decision makers make requests for information but they also 'build on information they have in framing their requests for information'.

The role of managers

Probably the most familiar analysis of the role of managers is that developed by Mintzberg (1973). Its significance for information behaviour lies in its recognition of managers' reliance on information. Senior managers play ten different roles that can be classified into three groups. In their interpersonal roles, managers act as figureheads, leaders and liaison people on the basis of their formal authority. In their informational roles they act as monitors, disseminators and spokespeople on the basis of their access to internal and external sources of information. In their decisional roles they act as entrepreneurs, disturbance handlers, resource allocators and negotiators on the basis of their authority and the information they are able to access and gather (Mintzberg 1975). These roles are integrated and inseparable although this does not mean that each is given equal attention. Recently Mintzberg (1994; Mintzberg 2001) returned to the theme of the integrated nature of managerial work focussing again on the significance of information to managers. In this analysis, managers enact two roles in each of three different but related dimensions of their work. In the dimension of information the roles are communication and controlling, in the dimension of people the roles are leading and linking, and in the dimension of action the roles of doing and dealing.

Management scholars have built on Mintzberg's earlier work through general studies of managers and their roles. Although their studies do not identify an informational role as such, it is clear the information is embedded in the roles that have emerged from these studies. Kotter (1982) analysed the work of managers and found that they executed two major tasks: agenda setting and network building. Kanter (1982) explored the roles of middle managers as innovators and change agents in organisations and also tracked changes in managerial work as traditional organisational hierarchies disappeared (Kanter 1989). Four sets of managerial activities were identified in a long term study of managers in their workplaces: routine communication, traditional management, networking, and human resource management (Luthans *et al.* 1988). Aguilar (1988) focussed on general managers and delineated four key roles: instigator, priority setter, integrator and taskmaster. All these roles have implications for information use.

Studies have also explored the roles of managers in particular processes and activities in organisations. Floyd and Wooldridge (1992) extended the analysis of the strategy process to include the contributions of middle managers as well as top managers to the process. Joyce and Woods (1996) surveyed studies of strategic management and identified the roles taken by senior management. Their review also analysed the paradigms that the studies represented. Dutton *et al* (1997) and Huy (2001) explored the contributions of middle managers to organisational strategy and their interactions with top management within a framework of organisational change.

It is clear that the different roles performed by managers are dependent on information. The activities that engage managers also rely on information, a point reinforced by a list of managerial activities drawn from fifty years of research:

- Acting as a figurehead, representative or point of contact for a work unit
- Monitoring and disseminating information
- Networking
- Negotiating with a broad constituency
- Planning and scheduling work
- Allocating resources to different work activities
- Directing and monitoring the work of subordinates
- Specific human resource management activities
- Problem-solving and handling disturbances to work flow
- Innovating processes and products

- Technical work relating to the manager's professional or functional specialisation (Hales 2001:50).

The activities of managers not only rely on information but the way they are executed influences the use of information and information sources and by implication the way they are used. Managerial work is characterised by the following features:

- Short, interrupted and fragmented activities
- An obligation to react to events, problems and requirements of others
- A preoccupation with the urgent, ad hoc and unforeseen rather than the planned
- The embedding or nesting of activities within others
- A high level of verbal interaction, often face-to-face or by phone but now, increasingly, by email
- A degree of tension, pressure and conflict in seeking to juggle competing demands
- Considerable choice and negotiation over the nature and boundaries of the job and how it is done (Hales 2001: 51).

The overview that has been presented is based on the literature of management. It reinforces the view that because managerial work is information laden the experiences of managers are appropriate for the empirical study of information use. While organisations provide the environment for the study it is the nature of managerial work, the activities of managers and their roles that are the context of managers' information behaviour and their information use.

Information and the role of managers

The importance of information in the role of managers and managerial work are two themes that emerged from an analysis of the management literature and they are reflected in the information behaviour literature. An extensive review by Katzer and Fletcher (1992) addressed the information behaviour of managers and presented a model of their information environment. Central to the model is a problematic situation that although 'created and defined by a single individual…is also shaped by features of the setting' (Katzer and Fletcher 1992: 231). As a problematic situation unfolds and moves towards resolution the manager's choice of role and activity, along with the salient dimensions of the problem, affect the information that is sought and valued. When the manager acts in a problematic situation information behaviours are initiated.

More specifically, information behaviours arise from the manager's considerations of 'whether or not to seek information, what information to seek, where to seek it, how to seek it, how much to seek, how to interpret it, how to assess it and how to use it' (Katzer and Fletcher 1992: 232). Characteristics of the problematic situations and of the manager are both relevant to information behaviours, including information use. The situations that the manager faces are usually messy in that they are ill defined, poorly articulated, fluid and intertwined. The environment in which the manager engages in dynamic, complex and unique activities is 'informationally overloaded, socially constrained and politically laden' (Katzer and Fletcher 1992: 249).

The review highlights the preferences of managers for oral communication, especially face-to-face, and their use of intuition in decision making with requested information often being used to justify or validate decisions after they have been made. Information use is part of a dynamic and iterative process of interaction among the information environment (constituted by the organisational setting, the manager's role, activities and problem dimensions) and information behaviours. A manager's problematic situations are being defined and redefined constantly as information is sought and used until the situations are resolved, at least in the mind of the manager (Katzer and Fletcher 1992).

Some of the studies carried out by information science researchers reinforce the interactions among the information environment of the organisation, managerial roles and information behaviour. Browne (1992) approached the development of executive information systems from an analysis of interviews with eight senior executives in public and private sector organisations. Five different kinds of information use were identified:

- conceptual use that can extend the understanding of a problem to be solved although at times the effect can be reduced understanding…

- instrumental use that relies on a direct link between information and a decision outcome…
- symbolic use that reifies rational and fair decision making processes in an organisation…
- tactical use that either delays action or substitutes for it…
- political use with the intention of persuading others by either disseminating information selectively through the organisation or by sharing information through cooptation so that others are committed to a decision making process and to its outcomes even though they are unknown at the time (Browne 1992: 43-45).

These latter uses in particular highlight the complexities inherent in the environment of organisations.

Another study focussed on the roles and activities of managers and executives and explored the contribution of information to their decision making (Marshall 1994). More than eighty per cent of the managers in the study reported that information provided from the corporate libraries in their financial institutions in the United States contributed to better informed decision making. Over half of the managers surveyed reported that the information enabled them to handle aspects of their decision making differently. It allowed them to proceed to the next step on a project or a task, decide on a course of action, improve the image of the financial institution and improve relations with a client and exploit a new business opportunity (Marshall 1994: 198). Although the focus of this study was on information from a particular source, a corporate library, it is clear that information is a key component in managerial activities.

These studies together provide evidence that managers are aware of the importance of information to them in their work and that information is part of the social and cultural milieu of organisations. To some extent information is embedded in organisational processes and so it might appear to be invisible to managers. When senior executives in firms in New Zealand reflected on using information from outside their organisations they thought more in terms of advancing specific issues than of the information itself (Keane 1999). The most frequently occurring actions of these executives in relation to information involved transferring it to others, mostly to those in the senior executive team. The next most frequently occurring action was decision making. No immediate action was taken in more than half of the information events captured in the study (Keane 1999: 442) a finding that lends weight to some of the observations made by Browne (1992).

A study of managers in Singapore, unfortunately marred by a low survey response rate, hints at a different set of actions taken by senior managers in relation to information. Rather than analysing information items volunteered by senior executives in terms of executive actions, de Alwis and Higgins (2001) asked senior managers to identify the most important tasks in which they used information. The three most highly ranked tasks are characterised by the use of information for presentation to others in a documented form such as a strategic plan, an executive summary or a report (de Alwis and Higgins 2001: 11). Curiously and in contrast to the findings of the study of New Zealand senior executives, the managers in Singapore ranked the passing on of information to a superior, a client and a colleague of lesser importance than preparing a document (de Alwis and Higgins 2001: 11).

Information use in these studies appears to be a process that evolves as the situations faced by managers and the tasks that capture their attention unfold. Streatfield (1984: 422) commented that 'the interests of senior managers are likely to be immediately concerned with the job in hand but will alter as their concerns change 'and Wilson (1988: 48) noted the fragmentary nature of the work and the brevity of tasks carried out by senior managers in local government authorities and agencies. The fluidity of managers' information behaviour was reinforced by White (1986: 166) who concluded in his study of manufacturing organisations in the United Kingdom that information need and information seeking behaviours of managers are based 'more on contingent reality and immediate problem-solving than on some notion of set functional roles and responsibilities'.

Information and managers

The information behaviour of managers is also influenced not only by the environment of organisations and the roles of managers but also by characteristics of information such as its quality, its sources and its flow in organisations and the personal attributes of managers such as their capabilities in information processing and information literacy.

Quality of information

The quality of information is not an objective dimension but the indicators of quality can include timeliness, accuracy, reliability and relevance to the decision to be made (O'Reilly 1982: 757; Marshall 1993: 17). This list can be extended to include considerations of the source of information, its time horizon, scope and type as well as its age and level of detail (White 1986: 158) speed of retrieval and amount of analysis and synthesis (Achleitner and Grover 1988: 98).

The relative importance of these indicators of the quality of information is contingent on its use so that any ranking of the indicators will vary according to whether information is used in strategic planning, management control or operational control (White 1986). A similar variation in the criteria for determining the quality of information emerged from a study that showed that Chief Executive Officers placed the greatest value on information that was both factual and future oriented (Keane 1999: 440-441). It is reasonable to assume that the time frame of information that is important to a very senior manager is different to that of managers at lower levels in an organisation and that it differs from task to task.

Sources of information

The focus of the thesis is information use rather than the use of information sources but it is not always easy to distinguish between the two. O'Reilly (1982) commented on the relative importance of the quality and accessibility of information sources as likely determinants of information use. The predominance of accessibility over quality can be explained by factors related to both organisations and information. The structure of some organisations, particularly those that are hierarchical, can deny access to information for some decision makers and incentive systems can privilege access to certain types of information. Information in organisations is often 'incomplete, vague and subject to multiple interpretations' and so neither credible nor reliable (O'Reilly 1982: 767). The relative accessibility of some information sources offers a partial explanation for managers' preferences for personal information sources over published information sources (Specht 1987; Houghton and Alexander 1990).

The notion of media richness also partially explains managers' preferences for some information sources (Daft and Lengel 1984; Daft *et al.* 1987). Based on the premise that a rich medium facilitates insight, understanding and shared meaning by reducing the ambiguity surrounding managers' interpretations of organisational situations, face-to-face communication has a very high level of media richness with the telephone for example being somewhat less rich. In comparison unaddressed documents such as fliers and reports are lean media although addressed written communications such as letters and memos are not quite as lean (Daft *et al.* 1987: 358). Research has shown that rich media are preferred for communication that is high in equivocality, that is where situations are ambiguous and the participants have different frames of reference. Lean media are preferred for communication that is unequivocal or where situations are clear and participants have similar frames of reference (Daft *et al.* 1987: 361).

Media richness offers a plausible explanation for aspects of information use by managers in organisations. The prevalence of face-to-face meetings especially among senior managers of organisations and the use of written media such as memos and electronic media such as email for the communication of more routine messages is supported by the notion of media richness. The suitability of lean media in some activities was demonstrated in a recent study of the use of online information by purchasing managers. Four categories of managerial activity were identified as relying on use of the Internet: information gathering; interorganisational information exchange; online ordering; and bidding and payments (Kennedy and Deeter-Schmelz 2001). The benefits of electronic information use were identified as facilitating access to information and its exchange, providing a basis for the comparison of products and prices and saving time in the purchasing process (Kennedy and Deeter-Schmelz 2001: 283). While the lean media are appropriate to the communication of routine and uncontested messages and the rich media to the communication of potentially ambiguous messages, all media have the potential to assume a symbolic meaning beyond the message itself (Trevino *et al.* 1990: 84-88). Both the medium and the message can reflect the culture of the organisation, a point emphasised by Orna (2001).

When considering oral communication and people as sources of information the increasing prevalence of meetings at more senior levels of an organisation should not be overlooked (Wilson 1988: 48). Meetings have been found to be the most common form of scheduled, formal communication, usually called by superiors and so they support downward communication in an organisation (Luthans and Larsen 1986: 173). In contrast the exchange of information among people through informal networks in organisations encourages lateral communication (Grosser 1991). A strong preference for face-to-face communication emerged from Keane's (1999) study of very senior managers in New Zealand. They preferred to receive oral information communicated either in person or by telephone. In implementing executive actions it was found that meetings, both planned and unplanned, were preferred by most managers (Keane 1999: 442). Managers in Singapore shared with their New Zealand counterparts a similar preference for oral information and information from personal contacts outside the organisation with a marked preference for information sources that are easily accessible (de Alwis and Higgins 2001).

While it must be acknowledged that people have been shown to be a preferred source of information for managers in many studies, the importance of other sources needs to be acknowledged. There is a rich array of information sources available to managers. In a summary of research studies funded by Reuters in the period 1994-1996, it was noted that 'newspapers, journals and word of mouth were the most important and most heavily used' and that 'managers prefer print and other easy sources to online, microfilm or CD ROM' (Oppenheim 1997: 242). The preference for online information was associated with younger staff, marketing staff and people in the manufacturing and retail sectors.

While this particular categorisation of information sources appears to rely on published information sources a more holistic categorisation is possible. McCall and Kaplan (1990: 16) include the following elements in the universe of information sources in an organisation: systems and structures set up to keep people up to date, people around managers who volunteer information and can be approached in search of trouble signs, clues, and missing pieces of puzzles, the values of the organisation and the manager's own direct experience. Compaine and McLaughlin (1987: 18) refer to the knowledge of managers as a source of information along with other people when considering the information available to managers through their networks of contacts inside and external to organisations.

Managers' preferences for rich media can be aligned with the fragmentary nature of their work, the need at times for speedy decisions and actions and the primacy of easy access to information over its reliability. The links among the roles and tasks of managers, information sources and information has been summarised as:

> Managers prefer oral, face-to-face communication, quick resolution favouring access and speed to accuracy, not necessarily rational decision-making because of the instability, conflict and uncertainty of situations. However these situations are constrained and structured by managerial roles…managerial activities…decision-making…and problem dimensions (Baldwin and Rice 1997: 676).

Information flow

The discussion of managers' preferences for rich media and oral communication raises the matter of information flow in organisations. The Reuters studies confirm that the vast majority of managers agree that the free flow of information is vital to business success but many of those interviewed suggested that information does not flow freely because of political factors in organisations (Oppenheim 1997: 241). Many managers felt that they were not supplied with the information they needed to do their jobs by their colleagues, most of whom were senior to them but also some who were junior to them as well as some who were in other parts of their organisations (Oppenheim 1997: 242).

Although Oppenheim (1997: 242) attributes the reason for the withholding of information to the 'fundamental human trait' of gaining an advantage over others, White (1986: 169) advances the structure of organisations as an explanation, reporting that managers 'felt happier with the supply of internal information in companies with more organic organizational structures that could be described as flatter pyramids'. These structures enabled close personal contact through all levels of the manufacturing organisations that participated in the study. Even so, some of the middle level managers in White's (1986: 169) study reported a need for higher-level information that was denied to them. Information flowed in differential volumes with more information being reported upwards to senior managers but less information being reported downwards to middle managers. Achleitner and Grover (1988: 99) have considered the impact of organisational structure on information flow and have recommended that the structure should be modified where appropriate to accommodate the patterns of informal information transfer.

On the basis of these studies there is evidence of a mix of information and communication in organisations in relation to information flow. In their study Adam and Murphy (1995) focussed on the information flows that linked top executives to their environments inside and outside their organisations and they sought to differentiate information flows from communication flows. The essential difference between these two different modes of information and communication flows as information transfer is perhaps best expressed as the difference between reporting and interacting. The executives preferred information flows when dealing with 'more clearly understood and better documented problems' but communication flows when 'there was no clear agreement on or vision of an organizational problem or, more often, the situation was uncertain' (Adam and Murphy 1995: 347). The most predominant information flow was found to be upward with the executive as an information receiver, usually of information in documented form (Adam and Murphy 1995: 346). This finding offers another explanation for information overload as reported by senior managers.

Not all researchers make such clear distinctions between information and communication flows. In a study of the environmental scanning process among managers in the chemical industry in Portugal, Correia and Wilson (1997: 5) reported that 'communication is generally intense between the top manager and the functional directors, and among functional directors'. Their communication consisted of both oral and written information. The observation was made that 'chief executives tend to use oral communication more than functional directors…sometimes both forms are used to convey the same information, the oral form being used for the first approach, followed by a memo or a report' (Correia and Wilson 1997: 5). Similarly there was no clear distinction between information and communication flows made by Widén-Wulff (2000: 4) who referred to the role of middle management as having 'an active role as an information and communication link' in an open information environment.

Although the difference between information and communication in relation to preferences for media and communication channels is not clearly established, there is little doubt that those preferences are reflected in manager's information use. So important is information flow to managers and their success that they have been urged to modify the flow of information that comes to them when they move into a new position (Compaine and McLaughlin 1987: 23). Their management of information flow has been revealed as a very active process involving strategies for selecting information, reducing redundant information, reading and structuring information (Mendoza and Bescos 2001: 273-274).

Human information processing

Human information processing is a complex behaviour shaped by both personal and organisational attributes. Wang and Chan (1995: 36) identified these attributes in a study of the information processing abilities of senior managers. Among the organisational attributes they included rewards and incentives, culture of the organisation, structure of the strategic planning process and computer based support systems. In predicting the ability of managers to process information that was complicated, novel and ambiguous, nine personal attributes were found to be important. They are described in detail in Figure 5 below.

Figure 5

Personal attributes in information processing by top managers[1]

Cognitive complexity – cognitively complex top managers are better able process complicated and ambiguous information than top managers who are cognitively simple

Knowledge – top managers whose knowledge is externally focussed are better able to process complicated information than those whose knowledge is focussed in internal politics and operations

Mental models of success – top managers with a strategic orientation are better able to process complicated and novel information than their production oriented counterparts

Open-mindedness – top managers who are open-minded are better able to process novel information than top managers who are less open-minded

Time orientation – future-oriented top managers are better able to process novel information than past-oriented top managers

Personal values – top managers who have a preference for change are better able to process novel information than those who have a tendency to resist change

Tolerance for ambiguity – top managers with a high tolerance for ambiguity are better able to process information that is dynamic and ambiguous

Locus of control – internal top managers, or those who believe that the outcomes of their behaviour are the results of their own efforts, are better able to process dynamic information

Time devoted to environmental scanning – top managers who devote more time to this activity are better able to process complicated and dynamic information than those who devote less time to environmental scanning

[1]Based on Wang and Chan (1995: 35-39)

The importance of personal characteristics of this kind as well as situational factors in information processing also emerged from a study of the information use of owner/managers of small and medium sized businesses in Belgium. Those owner/managers with a greater strategic awareness, less experience of organisations and a desire for growth of the enterprise used more information (Lybaert 1998: 188). Their sensitivity towards information was found to be a function of personal attributes such as personality, education, and familiarity with business practices (Lybaert 1998: 175).

Another personal attribute that impinges on information processing is an understanding of what constitutes relevant information. A person's 'assessment of the cognitive and affective relevance of information received' along with attributes of the information will suggest whether it is actually used (Choo 1998b: 62). The ability to determine the relevance of information is associated with information literacy (Butcher 1998: 51).

A different approach to information processing focuses on the cognitive limitations to information use rather than personal attributes. Among the cognitive limitations is the tendency of the brain to filter information in line with beliefs, experience, values and attitudes and the feelings of threat when information disagrees with current beliefs (Butcher 1998: 51). Another limitation lies in bias that is manifest in cognitive processes that include: recall of specific instances of an event that makes overestimation of its frequency possible, selective perception so that expectations distort what is seen or heard, concrete information so that vivid, direct experience outweighs abstract information, data presentation so that items presented first and last are accorded undue importance and the law of small numbers so that small samples are regarded as representative of a larger group (McCall and Kaplan 1990: 26).

There are a number of processes that are pertinent to a discussion of the cognition of managers although a detailed exploration of these processes is beyond the scope of the thesis. One example of these processes is the development of mental models and frames of reference. There is the prospect that a clearer understanding of how managers process knowledge and form mental constructs will lead to improved methods for 'probing, debriefing and deconstructing managerial experience' so that it can be made accessible to others (Geisler 1999). While a detailed study of managers' cognitive processing is of interest to some organisation and management researchers it is not essential in orienting an empirical study of managers' experiences of information use.

Another process involves general thought processes such as using intuition, managing a network of interrelated problems, dealing with ambiguity, inconsistency, novelty and surprise and integrating action into the process of thinking (Isenberg 1984: 84). These thought processes challenge the view of managerial cognition as almost entirely rational and orderly. It has been suggested that experienced managers have learned to think opportunistically and in so doing they use higher-order mental processes. In other words experienced managers have learned to derive maximum benefit from information even if it is incomplete and to 'add value to sparse facts through the use of inferential processes, speculations, hypothesis generation, what if scenarios and the like' (Isenberg 1986: 785).

In an environment with high levels of uncertainty, little precedent to draw on, limited time and scarce information, intuitive decision making would seem to be an appropriate capability. Agor (1986) highlights the affective dimension of this capability when he compares the feeling cues experienced by the managers. At the point of decision, some managers felt strong emotions related to euphoria, excitement, harmony and commitment yet when an impending decision might be inappropriate or the selected option proves to be incorrect other managers felt anxious and uncomfortable even showing signs of distress (Agor 1986: 51). Also described as 'visceral judgement' intuitive decision making seems to be a significant capability for managers and one that is developed over time (Rhyne 1985: 330). Intuition is a means of going beyond rational data and information by using experience to get to the nub of a situation, make sense of it and begin to test various options (Clarke and Mackaness 2001: 166). Importantly, Simon (1989) pointed out that intuitive decision making should not be regarded as irrational.

It has been shown that mood and emotion influence what is retrieved and used from memory and how it is processed. A review article that draws together research in experimental social psychology and organisational behaviour suggests that affective influences operate on fundamental cognitive processes such as 'how people select, learn, remember, and use information' (Forgas and George 2001: 18). Routine and recurrent tasks are impervious to the influence of affective states because they require little open, constructive thinking whereas complex, strategic tasks requiring open thinking and the interpretation of ambiguous information and are more readily influenced by moods and emotions (Forgas and George 2001: 9).

Sense making, defined here as 'an interpretive process in which people assign meanings to ongoing occurrences' also has an affective dimension (Wagner and Gooding 1997: 275).

Studies show that business executives have a tendency to attribute the favourable performance of their companies to managerial actions and poor performance to environmental factors and external events. In managerial sense making these attribution tendencies point to a risk of overconfidence in 'self' and a drift toward 'managerial complacency and self-satisfied inaction' that would seem to invite the filtering of information and limit cognitive information processing (Wagner and Gooding 1997: 284).

Stress also impinges on information processing and there is evidence that cognitive functioning, including decision making, deteriorates under stress because of 'the utilisation of suboptimal cognitive processes and the appearance of cognitive errors and biases' (Ariely and Zakay 2001: 197). While stress is sometimes seen as a consequence of the large volume of information that managers receive (Reuters 1996), it can also be seen as a consequence of needing to process large amounts of information in short periods of time (Janis and Mann 1980). Whether it is a matter of too little actual time or of a perception of too little time that acts as a cognitive limitation on information use is yet to be resolved (Mann and Tan 1992). The volume of information and the time available are not the only factors contributing to stress in decision making. The criticality of a decision, the impact of decision outcomes and the personal and organisational accountability of the decision maker can also contribute to stress in decision making processes (Ariely and Zakay 2001: 197).

In the fields of information science, organisational theory and management arguments have been advanced for consideration of the affective dimension. Forgas and George (2001: 28) call for a 'comprehensive reintegration of affect and mood into our understanding of organizational behaviors'. Their call echoes a lament in information science for the 'relative neglect of affective aspects of information behaviour' (Julien 1999: 587).

There is a note of caution in any discussion of human information processing as an element in managers' information use. There are limitations in regarding managerial cognition as a personal, psychological matter. According to Mutch (2000) managerial cognition is also a social matter, a claim illustrated in his study of information use by managers in two British public house companies. The study raises issues of the recruitment and formation of managers as well as issues related to language, social class and information (Mutch 2000: 164).

Information literacy

Apart from managers' information processing capabilities their levels of information literacy will also shape their information use. In organisations, managers are required to be skilled in identifying, evaluating and using information effectively and adept in taking responsibility for understanding questions, diagnosing situations, drawing inferences and making judgements and decisions under time and pressure constraints (Bruce 1999b: 33; Quinn 1991: 15). Managers need to be not only information literate but also knowledgeable about information and the extent to which it can be ambiguous, contradictory and unreliable. They need to know 'where to go to ask crucial questions about information that intrigues or troubles them' (McKinnon and Bruns 1992: 15).

Not all people are able to turn data into information and knowledge in order to complete their work tasks in organisations. A study of auditors revealed that people's mastery of the constructive process of information literacy cannot be taken for granted (Wai-yi 1998: 388). A five stage process model of information literacy was developed and information strategies identified (Wai-yi 1998; Cheuk 2000). Each stage had an affective dimension and in reverse of Kuhlthau's (1993) Information Search Process, the auditors started their process confidently and became 'stressed, frustrated and annoyed when their ideas were contradicted by the information gathered' (Wai-yi 1998: 386). At the end of the process some auditors were anxious about management response to the services they had provided, others were too busy with the next task to reflect on the one just completed and yet others became uncertain and doubtful as they worked through the process.

Summary

This Chapter has outlined the conceptual framework of the empirical study of information use. Themes from the literatures of information utilisation, organisation theory, management, cognitive and social psychology have enriched the framework of the study. The discussion has been based on organisations as the environment in which the study is set and the role of managers and the nature of managerial work as the context of managers' information use. Research into information use in organisations and managers' information behaviour has been analysed in order to inform the design of the study. The literature has also sharpened the researcher's orientation to information use and will assist in analysing the data from managers participating in the study. The methodological framework of the study is outlined in the next Chapter of the thesis.

Chapter 5

Methodological framework of the empirical study

This chapter continues the theme of Chapter 3 that outlined the process of selecting phenomenography as the research approach for the empirical study that advances the thesis. This Chapter focuses on the study itself and addresses four topics that follow the chronology of the study:

- preparing for the study
- studying managers' information use
- analysing the managers' accounts of their experiences of information use
- criteria for evaluating the quality of the study.

With its knowledge interest in the qualitative variation in people's experience of a phenomenon or an aspect of the world around them, phenomenography is a research approach well suited to the study of people's experiences of information use and the meanings of information use that they attribute to those experiences. Because phenomenography is an interpretive approach the study should assist in developing a clearer understanding of the relation among people and information and the complexities of their interactions. The study set out to describe people's information use with the context of information use being determined by the work roles of people participating in the study, that is senior managers. The research questions that gave direction to the study and to the thesis were:

i) What are the different ways in which managers understand and experience information use?
ii) Is there a methodology appropriate to a people-centred view of information use?

Preparing for the empirical study

A pilot study was conducted in preparation for the study. It addressed the two research questions and enabled the researcher to refine the data gathering strategy in the form of the interview as well as her interviewing skills and to develop protocols for analysing the records of the interviews. The pilot study confirmed the suitability of phenomenography as the research approach for the study and the capability of the researcher in meeting the demands of the approach, especially in engaging participants in the interview and analysing participants' accounts of their experiences of information use.

Along with further reading and discussions with researchers acknowledged as leaders in phenomenography, the pilot study also allowed the researcher to clarify her understanding of phenomenography and its differences from other research approaches such as grounded theory and process consultancy that were more familiar to her at the time.

Refining the data gathering strategy

Three managers known to the researcher agreed to participate in the pilot study and to provide feedback on the structure of the interview and the researcher's approach to the interview as a conversation. Two of the managers were employed in public sector institutions and the third in a private sector firm. Both the structure of the interview and the researcher's interviewing capabilities were enhanced as a result of the pilot study.

Structure of the interview

In the pilot study the gathering of data relied on two interviews conducted a week apart. The first interview was devoted to situations in which managers used information and the second to exploring the managers' understandings of the phenomenon of information use in those situations. The structure of the two interviews drew on the work of Katzer and

Fletcher (1992) for the description of situations that were problematic for the managers and Mintzberg (1973; Mintzberg 1975) for the linking of the situations to managerial roles.

As a result of feedback from the three managers on the structure of the interviews and the researcher's growing appreciation of phenomenography the structure of the interview was modified considerably for the study itself. It became more attuned to the essential characteristics of phenomenography so that it reflected more closely the approach's reliance on second order description and the relation between managers and information. It became clear to the researcher that the structure of the pilot interview embedded some of her own assumptions about information use and placed the integrity of the study at risk.

In the study itself only one interview was conducted with each manager. The researcher's judgement was that the two interview structure of the pilot study was too heavily focussed on the behaviour of managers for a study that was more grounded in the experiences and understandings of information use. The actual interview agenda used in the study is discussed in more detail in a following section of this Chapter of the thesis.

Researcher's interviewing skills

The managers' accounts of their experiences were related during the interviews and some supporting documentation provided by the managers to the researcher. It was essential that the managers were able to recount their stories, to formulate their narratives and present them in their own words. The researcher considered the managers' feedback on the interviews and her own critical analysis of the tape recorded interactions with each manager. By the time of the study the researcher was better able to ensure that the managers provided uninterrupted responses by allowing more space for pauses in the telling and reflections on the accounts of experiences. The researcher was also more confident in clarifying uncertainties about her interpretations of the managers' experiences and seeking confirmation of those interpretations from the managers.

The researcher refined her note taking skills as a result of listening to the tape recorded interviews. Key words were jotted down during the interviews and more extensive notes made immediately after each interview as an accompaniment to the tape of each interview. The notes also recorded impressionistic observations of each interview and included a sketch of the interview site, comments on the manager's stance in the interview, impressions of the manager's understanding of information use and information and the researcher's critical assessment of the effectiveness of each interview in relation to the research questions. The notes also indicated at what stage of the interview a manager passed documents to the researcher.

After the second interview in the pilot study the researcher resolved to use the services of a person skilled in transcribing interviews. Two factors led to this resolution. The first was a matter of limited time available to the researcher. Each of the interviews in the study was estimated at forty five to fifty minutes in length and the transcription represented a period of time that was not available to the researcher. The second factor was a matter of the researcher's inexperience in the techniques and conventions of transcription. This is a highly skilled task and one that was beyond the researcher's time constraints. The researcher engaged a person with the necessary expertise who was willing to sign a confidentiality agreement with the researcher. The agreement is included in Appendix 2.

Developing data analysis protocols

In the course of the pilot study the researcher was able to refine the protocols used in the analysis of the data. Each interview with the participants was reviewed as soon as possible so that modifications could be made before the next interview was conducted. The review highlighted some of the weaknesses in the structure of the interviews and in the researcher's skills. It also enabled the researcher to familiarise herself with the managers' accounts as a first step in analysis. This was followed by simultaneous reading of the transcript and listening to the recorded interview a number of times so that the researcher could annotate sections of the transcripts and colour code them.

It was during the pilot study that the decision was made to rely on manual handling of the coding process rather than on a computer software package. This was determined in large part by the knowledge interest of phenomenography in the relation between people and phenomena and it was the researcher's judgement that this was more accessible to her through manual coding processes and the immediacy of hearing recorded voices while at the same time reading transcripts against the backdrop of the notes of the impressionistic observations as well as documents provided by one of the managers participating in the pilot study.

Confirming the choice of phenomenography

Until the pilot study had been completed the researcher was not fully confident of her choice of phenomenography as the research approach for exploring managers' information use. She was slightly uncertain of the extent to which managers would be able to differentiate sufficiently their experience of information use from the situations or tasks in which they used it. The responses of the managers in the pilot study were very articulate, reflective and conceptually framed when recounting their experiences of information use. It was at this point that the researcher committed herself to the research approach that she had selected and used in the pilot study.

Studying managers' information use

During the pilot study, the structure of the interview was modified, the researcher enhanced her interviewing skills and preliminary protocols for analysing the interviews were developed. In this section the study itself is described from the process used in selecting the participants in the study through to the process used for analysing the experiences related in the interviews.

Selecting the participants in the study

In selecting the participants for the study the researcher considered not only the people involved but also the particular environment in which the phenomenon of information use was explored. There is an increasing acceptance of the central importance of information in organisational strategy and development and the adoption of technology enabled information and knowledge management strategies in organisations is evidence of the value attributed to information as an organisational asset. It was for this reason that organisations were preferred as the location of the study's participants in preference to other groupings of people such as say schools, community agencies or political parties.

It was against this background that purposive sampling was selected as the basis for identifying the study's participants (Lincoln and Guba 1985: 200). This approach to sampling ensured that maximum variation within the constraints of the research questions was possible. With the knowledge interest of phenomenography in the variation of people's experiences of a phenomenon purposive sampling offered as much variation as possible in the managers' experience of information use. The actual size of the sample was guided by informational considerations rather than statistical considerations and by studies that have relied on phenomenography as the research approach. These studies involve 'on average between fifteen to thirty participants' although some studies have involved fewer participants (Franz 1994: 176).

The selection of the participants followed a two stage process. In the first stage two organisations were selected as locations of the managers who were to participate in the study and in the second stage the managers themselves were selected as participants in the study. The two organisations offered the possibility of different experiences of information use because of their differences as organisations although they are both in the same industry sector, cultural industries, and both are largely funded by government. As this is an exploratory study it was felt that there needed to be some constraints on the selection of the participating managers. The researcher's judgement was that those constraints are more consistent with the study's integrity if they are derived from industry related factors such as industry sector and major funding source rather than organisational factors such as size, number of employees or organisational structure. Within the parameters set for the selection of the two organisations there is considerable difference as Table 5 illustrates.

Table 5

Organisations selected for the study[1]

	Organisation A	Organisation B
Responsible government	National	State
Revenue from government	$542,383,000	$46,766,000
Number of employees (eft)	4134	443

Based on the annual report for each organisation for the year 1998 - 1999.

There were also some pragmatic reasons for the selection of these two organisations. These included the researcher's familiarity with the organisations and the relative ease of access to people in the organisations. The researcher reviewed the implementation of business planning processes in one of the organisations some months prior to commencing the study and has been a professional colleague for some time of several senior managers in the other organisation as well as a co-researcher on a project in which one of the key stakeholders and contributors was this particular organisation.

Having selected the two publicly funded cultural industry organisations the researcher then attended to the selection of the managers whose experiences of information use would be explored in the study. The major reason for selecting managers as the people whose understanding of information use would be described emerged from the analysis of the literature that guided the study. The roles of managers have been shown to be information intensive and so the researcher was confident of the likelihood that managers' experiences of information use would yield the variation demanded by phenomenography.

The level of senior manager was judged by the researcher to be appropriate for the participants in the study because of their engagement in implementing organisational strategy and their function as links or mediators between top management and the rest of the organisation. It was felt that this linking role offered opportunities for different experiences of information use within each organisation and across the two organisations. Although the participants in both organisations were at similar levels there were varied reporting relationships to top management as well as varied responsibilities.

The senior management positions of the participants in the study are summarised in Table 6 that follows. For ease of classification the term 'division manager' is used to denote a manager who either reports directly to the chief executive officer or is responsible for a functional area of the organisations. The term 'branch manager' is used to denote a manager who reports to a senior manager accountable directly to the chief executive officer of the organisation and is responsible for a unit within a functional area. In structural terms the participants in the study are those in the top two or three layers of the management structure of their organisations.

Table 6

Senior management positions of the participant's[1]

	Organisation A	Organisation B	Total
Division manager	3	4	7
Branch manager	3	5	8
Total	6	9	15

[1]Based on information provided by participating managers

The areas of responsibility of the study participants included both program areas and program support areas in the two organisations. The program areas were all responsible for delivering services to clients of the organisations either across Australia or one of its states. Because of their government funding the organisations' primary clients are the general public although particular services are intended to meet the needs of particular groups. For example, one organisation delivers services to people in particular geographic areas as well as nationally and delivers its services through different media. The other organisation delivers services to geographic areas within state boundaries but because of the nature of its services some of them are delivered beyond state borders through media that are unique to it as well as media common to both organisations.

The areas of responsibility of the managers who participated in the study are summarised in Table 7. It is evident that about half of the participants are responsible for public programs and the remainder of the participants are responsible for the support of those programs.

Table 7

Areas of responsibility of the study participants[1]

	Organisation A	Organisation B	Total
Public programs and service delivery	2	6	8
Policy	1	1	2
Human resources	2	1	3
Information Technology	0	1	1
Marketing	1	0	1
Total	6	9	15

[1]Based on the annual report for each organization for the year 1998-1999

The selection process followed in each organisation differed slightly. In one organisation a senior manager in the corporate services area provided the researcher with a list of managers who met the requirement of being a senior manager in terms of the study, had contributed to the business planning process implemented in the year prior to the study and in her view would be familiar with the organisation's goals. The researcher then contacted the managers and invited them to participate. All the managers nominated by their colleague agreed to participate and were sent further information on the project and on the protocols pertaining to their participation.

In the other organisation one manager in the corporate services area sent an email about the project to managers who met the study's requirement of a senior manager. The managers were invited to contact the researcher if they were willing to participate in the study. Of the ten managers contacted by the manager in the corporate services area nine were able to participate in the study within the timeframe set by the researcher. A total of fifteen managers from both organisations participated in the study. They were either members of the senior executive committee of their organisations or they reported directly to a member of the senior executive committee. No participant was a Chief Executive Officer.

Designing the data gathering interview

The use of the interview in phenomenography is consistent with many of the phenomenographic studies read by the researcher (see for example Marton *et al.* 1993; Bruce 1997a; Barnard 1997). The predominance of the interview as a data gathering strategy has also been explored in recent theoretical explorations of phenomenography. Svensson (1997: 166) suggests that conceptions are most accessible through language although they might be expressed in different forms of action. The relational view of knowledge fundamental to phenomenography assumes that thinking about external reality creates knowledge. There is then a relation between thought and reality that is reflected in language that has its own social and cultural context. Interviews rely on language and so they offer the opportunity to explore conceptions as a relation between the interviewees and parts of their world, or as their experienced understandings of a phenomenon.

The interviews in the pilot study, although flawed to the extent that they did not consistently offer opportunities for the participants to distinguish between their understanding of information use and their information use behaviours, were effective in enabling the participants to reveal their understandings of information use. The structure of the interview was amended to ensure that its focus was aligned with the knowledge interest of phenomenography, that is variation in conceptions of information use, not as an abstraction or a behaviour but in terms of the understandings and meanings that the phenomenon of information use has for people.

Following the pilot study specific decisions, listed below, were made about the interview as the data gathering instrument.

i. Only one interview was carried out with each participant in the study.

ii. The interview questions were redrafted to encourage the participants to adopt a second order perspective on information use and recount their experiences of information use. The redrafted questions also encouraged the researcher to bracket aside assumptions, preconceived ideas, prior constructs, evidence from authoritative sources as well as her own knowledge and beliefs. This bracketing or phenomenographic epoché (Francis 1996: Ashworth and Lucas 1998) recognises that entering the second order reality of others is not a straightforward matter.

iii. The interview questions invited participants to describe their experiences with the focus being more sharply placed on the experienced understanding or meaning of information use in a social and cultural context (Svensson 1997: 163). The participants were able to more freely relate their understandings of the phenomenon of information use while at the same time drawing on their experiences in their current work roles. In the interest of creating a less structured climate for the interview the prompts used in the pilot study were replaced by phrases that invited elaboration such as 'Can you describe or explain that a little more?' 'What do you mean when you say…?' or 'Perhaps you have some more to say about…?' (Bowden 1996).

iv. The changes made to the structure of the interview also allowed the researcher to more effectively suspend her own knowledge and experience as the questions were asked, descriptions invited and any clarification or elaborations sought from the participants. The more loosely structured interview agenda enabled the researcher to approach the interview more on the participants' terms and to achieve bracketing.

v. Because the researcher is also a component of the data gathering instrument she needs to engage with each participant in a conversation that encourages the uncovering of the experiences of information use and reflections on those experiences. Participants need the time and space to pause and reflect on their experiences and so the researcher is obliged to offer that time and space to them. With the changes made to the structure of the interview it assumed more the style of a flowing conversation and much less that of an abrupt interrogation.

As an outcome of the pilot study and feedback from the managers who were interviewed refinements were made to both the interview agenda and the researcher's interview technique. These refinements served the purpose of focussing more on the knowledge interest of phenomenography and enhancing the quality of the study and its outcomes. The pilot study was invaluable to the empirical study in orienting it more closely to the variation in the participating managers' experience of information use. The structure of the interview is shown in Figure 6 that follows.

Figure 6

The structure of the interview used in the study

Question 1 Organisational role

Clarify the manager's current role

- current role, responsibilities and tasks
- current reporting and supervision lines
- the role, functions and work of the unit managed and its place in the organisation

Question 2 Situation 1

I would like you to tell me about your experiences of information use in a situation that you've been involved in as a manager with the kinds of responsibilities that you have. The situation has probably come about because it's on your agenda in meeting the organisation's goals. It might be an on-going situation and may not be resolved in the sense of being finally put to rest. It's dynamic in nature and has probably changed over time. I'm interested in this situation as a context for exploring in more detail your experience of information use.

a) Now can you tell me a little about the situation that you've selected?

b) I would now like us to shift the focus from the situation to your experience of information use. Can you please describe that experience?

c) How might you describe in a word(s), phrase(s), metaphor(s) or with an analogy (ies) your experience of information use in that situation?

Question 3 Situation 2

As for Question 2 but based on another situation as a manager with the responsibilities that you have in the organisation.

Question 4 Experience of information use So far we have been looking at your experience of information use in each situation only. I would now like us to turn our attention to the two situations together while we continue to talk about your experiences of information use. Can you compare and contrast your experiences of information use in those two different situations?

The primary purpose of the interview was to uncover the variation in the participating managers' experiences or understandings of information use. Questions 2, 3 and 4 were designed with this aim in mind. Questions 2 and 3 asked the managers to describe their experiences of information use in particular situations. Question 4 invited the managers to compare their experiences and to note any similarities and differences. Question 1 allowed the researcher to confirm that the managers who had been nominated or volunteered to participate had the appropriate linking role and accountabilities on which the study was based.

Gathering the data through interviews

The interview in a phenomenographic study, like that in other qualitative studies, is essentially a conversational partnership (Rubin and Rubin 1995: Kvale 1996). Its distinguishing features stem from its primary purpose. In keeping with a conversational partnership, the interviews took place during meetings between the researcher and each of the fifteen participating managers in their workplaces. In all but one instance the meetings were held in the managers' offices. In this instance the meeting took place in a small meeting room adjacent to the manager's desk in an open plan office.

This location was selected for a number of reasons. First of all the setting was familiar and convenient for the managers and it respected the many demands on their time and attention. Secondly the workplace setting reinforced the social and cultural contexts of the managers' experiences of information use. Thirdly the setting allowed the researcher to make some impressionistic observations that were recorded in her notes immediately following each meeting and used later with tapes and transcripts in recreating the immediacy of the interview during the analysis of the data.

Each meeting with the participants in the study followed the same general pattern. It opened with greetings and an invitation to the participant to clarify any aspects of the correspondence sent by the researcher at least two weeks prior to the meeting. The correspondence, included in Appendix 3, consisted of a description of the study and an outline of the interview. An explanation of the consent form and its signing as required by the approval for the study granted by the University's Human Research Ethics Committee then followed. The researcher gave an assurance of anonymity and confidentiality at this stage of the meeting which then moved on to the researcher's seeking permission to tape the interview and testing the equipment. The consent form is included with the correspondence to the participating managers in Appendix 3. The data gathering then began using the interview schedule shown in Figure 6 above.

Following the interview the researcher outlined the process of sending the transcript of the interview to the manager for the purpose of checking factual accuracy and requesting its return so that data analysis could commence. The meeting concluded with the researcher thanking the manager for participating in the study. The meetings lasted from forty-five minutes to one hour and twenty-five minutes with most meetings lasting about one hour. The meetings took place in the period between 26 October 1999 and 22 December 1999.

The researcher listened to the tape of each interview and read her notes on the day after meeting each manager. In this way the researcher was able to monitor the effectiveness of the interview in encouraging the managers to reflect on their experiences of information use and her capabilities in gathering data. Over the course of the interviews the researcher made very little modification to her technique. The researcher then sent the tape to a specialist transcriber. On its return each transcription was checked against the tape and any corrections made by the researcher. The transcript was then sent to the appropriate manager so that factual details could be checked. Any additions or alterations were transferred to the authoritative transcript by the researcher. A letter was then sent to the manager acknowledging support of the study and thanking her or him for contributing to it. It was necessary to send reminder letters to two managers before all transcripts were returned to the researcher.

The primary aim of the interview in a phenomenographic study is reflected in its focus, design and implementation (Bruce 1994: 50-53). It is reflected also in the role of the researcher as interviewer. Each of these aspects is discussed with reference to some of the interviews that occurred during the meetings with the fifteen managers. In the exchanges that follow the researcher's comment is shown in bold typeface. The manager is not named, nor is the organisation identified although the manager's level in the organisation is indicated. The page number refers to that of the transcript.

Focus of the interview

The variations in managers' experiences of information use was the focus of the interviews. It was neither the managers nor information use but the relation between the two that was the focus. Information sent to the managers prior to the meetings was designed to encourage them to consider the situations they wished to outline in the meetings. The example that follows illustrates the researcher's strategy for focussing one manager's attention on the purpose of the interview.

> I've jotted down four things. In one I produced this (holding up a report) and that one there (pointing to an annual report) is the latest one that I've finished. So there's that project. There's another that's a pilot that I started at the beginning of the year and it's underway at the moment. We're just about to launch a guide that's part of it. Out of these four I don't know which ones. Three are underway and one's completed…They're all very current. It's just a question of what you want out of them.

> **What I'm really interested in are some of the different ways that people experience information use. So would you mind thinking about your experience of information use and allowing that to guide your decisions of the situations that you choose to talk about in your work as a manager? (Interview 5 page 1: division manager)?**

The researcher was successful in encouraging the manager to select two different situations in which she experienced information use and then focussing the manager's attention on information use rather than the situations themselves.

Design of the interview

The interview is designed to lead the participants to describe how they understand information use. The linking of the experience of information use to particular situations encountered in the manager's work was intended to orient the managers to information use and this seems to have been effective. All managers except one had little difficulty in talking about two situations as contexts for their experience of information use. That one manager shifted her attention from experiences of information use to an explanation of her management style in the initial part of the interview. The manager settled her attention on one situation when the researcher asked:

> **What you have told me is very interesting but would you mind focussing more on your actual experience of using information as a manager? It might help to take that last situation that you mentioned and tell me a little more about it and then describe your experience of information use (Interview 1 page 7: branch manager).**

This intervention in the manager's response led her back to describing the particular situation and her experience of information use. Once this description had been exhausted the manager was ready to move on to the second situation.

In another interview the manager outlined a situation that was quite complex in terms of the negotiations that he had with different partners. To avoid losing the focus on his experience of information use as his story unfolded and moved from partner to partner the researcher asked:

> **So how might you describe your experience of information use in this whole process (Interview 14 page 19: branch manager)?**

The manager responded to this question describing his experience:

> I suppose to some extent the information gathering has been a bit arduous in the sense that there's a lot of shibboleths and preconceived ideas about the way things were (Interview 14 page 19: branch manager).

The phenomenographic interview is also shaped by the need to uncover not only the participants' understanding of a phenomenon but also the variation in that understanding. The managers were asked to explore their experience of information use in two situations and then to compare their experiences in order to uncover any variation in that understanding. Not all of the managers were able to articulate the similarities and differences in their experience of information use but most were able to do so. The situations that were selected by the managers were varied and so too were the social and cultural contexts of their experiences of information use. Figure 7 that follows summarises the variation in the situations in which the managers experienced information use.

Figure 7

Variation in situations selected by participating managers

The situations in which the managers experienced information use included: • coordinating publications for distribution or sale to the public • reviewing own performance as a manager and reporting to supervisor • restructuring parts of the manager's branch or division and its operations • participating in a delegation to government to secure funding • preparing reports to government • developing public programs and services • coordinating communication between senior management and staff • resolving a conflict of interest issue • preparing a position paper for the organisation's governing body or executive committee • reviewing and renegotiating a partnership agreement on behalf of the organisation • reviewing building plans and preparing for relocation of parts of the organisation.

This variation in situations suggests that the design of the interview was consistent with the purpose and focus of phenomenography.

Implementing the interview design

During the actual interview the researcher needs to facilitate the uncovering of the managers' experiences of information use so that their understandings of the phenomenon can be described. The researcher must be alert to signs that the interview might be lapsing into something other than a conversational partnership. In order to see how the managers construe information use, the researcher must encourage the managers to reflect on their experience, explore any analogies that are used, pursue any issues or areas of confusion and ask for elaboration where necessary so that the meanings of the managers' descriptions are clear to the researcher and shared with the managers (Bruce 1994: 52-53). The researcher must focus on the experience of the managers rather than on her own experience and must suspend any judgements about the value or merits of the managers' experiences of information use.

The interviews were implemented effectively on two different sets of criteria. The first set relates to the responses and comments of some of the participating managers. For example, one manager commented during the course of the interview:

> If you'd asked me before we started talking I probably would have lumped my experiences of information use together as being the same. But in talking about them I can see a difference in that while I was verbal in both of them. I do believe that I was listening more in one of them. It was their focus…and what they are saying is the most important part of it, even if I don't always agree with it… in the other one I was having to deal with the files and issues and the matters back here [in the organisation] (Interview 13 page 26-27: branch manager).

The second set of criteria for determining the effective implementation of the interview is related more to the analysis that was made possible by the data that was gathered. The analysis is presented in more detail in the following Chapter but the categories of description and the outcome space signify the understanding of information use by the participating managers and indicate the subject-object or manager-information relation. These outcomes in themselves along with the description of the research process suggest that the implementation of the interview was effective.

Role of the researcher

The researcher as interviewer faces the challenge of seeing information use as the participating managers see it. So the task for the researcher was to assist the managers to thematise information use and identify the internal and external horizons of the managers' experiences of information use (Bruce 1994: 50). Similar demands of the researcher are also made by Marton in claiming that:

> The interview…should facilitate the thematisation of aspects of the subject's experience not previously thematised. The experiences, understandings are jointly constituted by the interviewer and interviewee. These experiences, understandings are neither there prior to the interview, ready to be 'read off'. Nor are they only situational social constructions. They are aspects of the subject's awareness that change from being unreflected to being reflected (Marton 1994b: 4427).

Marton's claim draws attention to the intersubjectivity of the interview and also reinforces its purpose.

The researcher met the demands placed on her in several different ways. One manager expected the researcher to set up 'leading prompts' along the lines already discussed to focus the interview (Francis 1996: 39) and to support his reflection on his experiences. His expectation of the researcher was that

> …I've got these two situations in mind…and I don't know, it'll be up to you to quiz me about how information was used in those things. I can talk about my experience of those two situations but you'll need to help me with the experience of information use in them (Interview 4 page 1: branch manager).

The researcher was involved in encouraging another manager to pursue the focus of the interview when she had difficulty in doing so. Here the researcher acted more as a coach in assisting the manager to make explicit her implicit understanding of information use:

> I'm finding this really hard. Obviously I do stuff all the time that uses information.
>
> **There's no suggestion that the situation that you choose needs to be resolved or completed. These things are often ongoing, messy and take your attention.**
>
> I probably should have written down a lot of the information that comes out of my head.
>
> **Take your time and think about a situation or something that you've had to do for the organisation in implementing its strategies. We'll talk about that for a while and then we can move on to talk about your experience of information use in that context.**

> (After a pause) OK what I'll choose to start with is the writing of [report for government]. It's one of the millions of compliance things that I've had to do (Interview 10 pages 2-3: division manager).

The following exchange between the researcher and one of the managers reinforces the role of the researcher almost as a traveller wandering with the managers through the interviews and then relating the interpretation of what has been heard and jointly constituted at the journey's end (Kvale 1996: pages 4-5). The researcher's words appear in bolded type.

> **What I'm trying to capture is the variation in people's experiences of information use.** I'm unclear when you talk about information use whether that's for my own internal management purposes or exactly what you mean.
>
> **Well, the focus is not so much what you use information for but what you understand information use to be. Now the purpose of using information might be part of your understanding but it need not be. Can I suggest that we begin by talking about one of the situations that you've selected and we use that to frame our conversation about your experience of information use (Interview 2 page 1: division manager)?**

Analysing the data

In a phenomenographic study analysing the data has a similar purpose to data gathering and that is uncovering the participants' understandings of an aspect of their worlds. In this study the purpose of the data analysis was to reveal the qualitatively different conceptions of information use that together represent the phenomenon of information use as experienced by the participating managers. Marton captures the general approach to the analysis of data in a comparison he made between phenomenographic analysis and content analysis:

> …in [content analysis] the categories into which the utterances are sorted are determined in advance…[by contrast] the phenomenographic process is tedious, time-consuming, labour-intensive, and interactive. It entails the continual sorting of data…definitions for categories are tested against the data, adjusted, retested and adjusted again. There is however a decreasing rate of change and eventually the whole system of meanings is stabilised (Marton 1986: 42).

Marton's brief overview of the analysis of data highlights the need for the researcher to continue to bracket or practice epoché not only during the gathering of data but also during its analysis.

There has been discussion of the analysis process in recent times with some debate about the formulation of the categories of description and the outcome space being one of construction or of discovery. Walsh (1994: 19-24) identifies some of the consequences of each approach. The process of construction implies that the researcher's framework is paramount and that some of the data from participants might be discounted or categories omitted should they not conform to that framework. There is also the possibility that the interpretation of the data might be skewed by virtue of the primacy of the views (or conceptions) of the researcher. By contrast the process of discovery places more emphasis on the similarities and differences among the data than on the hierarchy of categories that is represented in the outcome space. This emphasis raises the possibility that the analytical process, at least as it relates to the structural elements of the conceptions and their arrangement in the outcome space, might be bypassed.

A related issue concerns the potential decontextualisation of the data that might occur when a transcript is considered in isolation from other data. It can be argued that the analysis process involves processes of both discovery and construction, a resolution foreshadowed by the suggestion that 'conceptions are discovered, categories of description are derived' (Johansson *et al.* 1985: 250). Conceptions as the knowledge interest of phenomenography are uncovered from the data and the categories of description as the outcomes of phenomenography are constructed on the basis of an analysis of their referential and structural elements.

Just as there are no prescribed guidelines to follow in developing a phenomenographic interview and implementing it so there are no prescriptions to follow in analysing the data that is gathered in a phenomenographic study. Bruce (1997a: 104) however suggests that such prescriptions are inappropriate in light of 'the interplay between the researcher's understanding, the nature of the phenomenon being studied and the style of the available data' that occurs in the process of capturing the world of lived experience. In her study of information literacy Bruce relied on Sandberg's five phases of phenomenographic analysis (cited in Bruce 1997a: 104-106):

- becoming familiar with the transcripts
- the noematic level of the intentional analysis or focusing on the referential or meaning element of a conception
- the noetic level of the analysis or focusing on the structural element of a conception
- the intentional constitution of the conception or drawing together the referential and structural elements of a conception
- establishing the outcome space of the conceptions.

The iterations among these phases informed the process used to analyse the data captured in the interviews with the managers participating in the study.

The approach to the analysis of the data in the study was based on that used by Bruce (1997a) in her study of the conceptions of information literacy. This approach was selected for a number of reasons. The approach was clearly outlined by Bruce (1997a: 104-106) and her report provided both a description of the process and a justification for it in terms of phenomenography. It was grounded in approaches used and described in reports of previous phenomenographic studies so to this extent its effectiveness conformed to the expectations of a reliable approach to data analysis that had accumulated over some time. Bruce's study, like the current study, was one that pursues the line of inquiry in phenomenographic research concerned with the nature of conceptions in a field beyond learning and education. It was also relevant to information science in that it explored conceptions of information literacy. Limberg's more recent study (1999a) is also relevant to the current research but the full report of it is written in Swedish, a language neither read nor spoken by the researcher.

Another significant reason for relying on Bruce's approach was that it employed the researcher as the sole analyser of the data. Some other phenomenographic studies have involved the researcher working with a group of colleagues who jointly discuss the developing conceptions and categories of description (for example Bowden 1996; Trigwell 2000). One study involved two different approaches to analysis with the first relying on a phenomenographer who challenged the researcher's discovery of the emerging conceptions and categories of description in regular weekly meetings and the second relying on the researcher analysing the data alone and having the categories of description checked against the data when they had been finalised. In a report of the approach to analysis in this particular study the researcher expressed a preference for the efficiency of the immediate challenge in the first approach. At the same time she commented on the difficulty of maintaining the self-discipline demanded by the 'lone researcher' approach (Dunkin 2000: 147).

In the current study the researcher took the role of 'lone researcher' because of the lack of readily available experienced phenomenographers at the time of data analysis. The researcher though planned the analysis process mindful of the need to leave periods of time within and between the phases of the analysis process so that she could return to the transcripts and the analysis of them with a fresh perspective and so maintain a satisfactory level of rigour. Dunkin (2000: 146) refers to the benefit of the weekly breaks that she took when refining categories of description and the role of the breaks in reducing her level of ownership of the categories that she had developed to the point that they became objects of study in themselves.

The analysis process passed through five different phases but it should be emphasised that the process was an iterative one and the boundaries between the phases are fuzzier than the description would suggest. The five phases, each of which represents a different focus in the analysis were

- becoming familiar with the transcripts
- discovering the referential or meaning dimension of the conceptions of information use
- discerning the structural dimension of the conceptions of information use
- describing the subject-object relations that comprise the different conceptions of information use, labeling the different conceptions and constituting the categories of description
- constructing the outcome space.

A description of the analysis process with its different phases follows. The description identifies the purpose of each phase and the guiding questions used by the researcher in the analysis of the data. The process used in each phase is outlined with reference to the relevant literature where appropriate. The annotated and flagged working papers from each phase are available on request from the researcher until December 2009.

Phase 1: Becoming familiar with the transcripts

Purpose: to identify from the interviews the conceptions of information use that seem to be evident in the manager's statements.

Guiding questions: How does the manager construe the phenomenon? What concepts are used to explain it? What types of similarities with other concepts are introduced? (Säljö 1988: 41; Bruce 1997a: 104)

Process used: In checking the transcripts against the audiotapes during the data collection phase the researcher began to enter this phase but when starting to analyse the data her focus shifted more clearly to identifying conceptions. Prior to reading each transcript the researcher read her notes of the interviews and assembled any documents that were provided to her during or after an interview. She then read each transcript while at the same time listening to its corresponding tape. This use of the notes, transcript, documents and tape together was repeated to overcome the limitations that are inherent in the transcript as a verbatim report of an interview. It recognises that the transcription process itself is not a neutral event (Kvale 1996) and that there is not a simple one-to-one relationship between the interview as a conversational event and the transcription of the interview (Lapadat and Lindsay 1998: 72). The use of these different sources of information pertaining to the interview enabled the researcher to capture more readily the emotion and emphases of the managers' experiences and the meanings attributed to those experiences by the managers (Ashworth and Lucas 2000).

During this phase the researcher annotated the transcript where necessary to reflect emphases and emotions evident in the audiotape. Sections of the transcript that seemed to show different conceptions of information use within it were marked so that the context of the statements that revealed conceptions could be preserved. This procedure was repeated for each transcript at least three times over a period of six weeks. On the first occasion the transcript was marked on the right hand edge and on the second the right hand edge was covered and the left hand edge was marked. On the third occasion a freshly printed copy of the transcript was used and then the three sets of markings were compared. The marked extracts were then examined to ensure that they were statements that reflected conceptions of information use. Towards the end of this phase the researcher had identified a pool of meanings in relation to the phenomenon of information use. This pool of meanings then contained material that could be analysed from two different perspectives: that of the context in which it occurred and that of other interviews where similar themes were explored and identified (Marton 1986: 198; Marton and Booth 1997: 133).

Phase 2: Discovering the meaning dimension of the conceptions

Purpose: to identify the referential or meaning dimension of the different conceptions.

Guiding questions: In what ways is the person experiencing information use here? How might the statement: 'Information use is seen/experienced as…' be completed on the basis of the data? (Bruce 1997a: 105)

Process used: During this phase the transcripts were marked with commercially available coloured flags with each colour signifying a different meaning attributed by the managers to information use. In contrast to the usual process of content analysis the researcher's focus was on the different meanings of the linguistic units in the interviews, supported by the notes made and material provided by the managers at the time of the interviews, rather than the linguistic units themselves. It is in this phase that the boundaries between the individual managers disappear as the categories of description begin to emerge. In the process of responding to the guiding questions and flagging the transcripts the researcher is formulating a summary of the meaning of the data that is grounded in the data itself. This reduction, according to Svensson (1997: 167-168), aims to 'give summary descriptions of parts of data corresponding to conceptions of phenomena. Thus such parts of data [are] abstracted from the rest and condensed as to their meaning and grouped under categories'.

It took some time for the different meaning groups to stabilise. At first the researcher tentatively identified six different meaning groups, then seven meaning groups, then six meaning groups and finally five different meaning groups. As the meaning groups developed the researcher changed the coloured flags on the marked sections of the transcripts accordingly. The researcher allowed at least two weeks to pass between each confirmation of the allocation of the flagged sections of the transcripts to the different meaning groups. At times reference was made to the marked sections of the transcripts in order to clarify and confirm the meaning being attributed to the phenomenon of information use by the managers.

Phase 3: Discovering the structural dimension of the conceptions

Purpose: to identify the structural or focal dimension of the conceptions.

Guiding questions: What does the manager focus on when experiencing information use in this way? What is focal to the managers in their differing ways of experiencing information use? (Bruce 1997a: 105)

Process used: Using a freshly printed copy of each transcript extracts corresponding to those marked with coloured flags signifying the different meanings attributed by the managers to the phenomenon of information use were arranged in groups according to their meanings. Each group of extracts was then analysed using the guiding questions to discover the focal elements of each meaning group. Although the number of meaning groups did not change, some individual extracts were moved to different meaning groups suggesting that that the meaning and structural dimensions of awareness are intertwined. Marton and Booth (1997: 87) conclude from their analysis of awareness that 'structure presupposes meaning and at the same time meaning presupposes structure' and that both occur simultaneously when an individual experiences a phenomenon.

This phase of the analysis is more than a data sorting activity. It involves searching for the 'most distinctive characteristics in the data…the structurally significant differences that clarify how people define some specific portion of the world' (Marton 1986: 34). These differences can be seen in the light of the nature of awareness. That is, something can be experienced as something by discerning certain entities or aspects and being simultaneously aware of these certain entities or aspects. In this way parts can be related to parts, parts to whole and whole to context (Marton 1996: 179-180). The researcher considered each extract in the contexts of its transcript and its meaning group when discerning the structural dimensions of the different meaning groups.

Although there is little reference in the reports of phenomenographic studies to the actual physical manipulation of transcripts the researcher made a decision to cut the extracts from the transcripts in the interests of making it easier to handle them and move them around as necessary. Because of the importance of the context in which the phenomenon of information use was experienced and the imperative to discover the meaning of the different conceptions in the context of those experiences, the transcripts were kept whole for the purpose of analysis until this point. Each extract was coded and indexed in such a way that it was simple to locate it in the transcript from which it had been extracted. A similar action was taken in one study where the researcher manipulated the transcripts by creating separate computer files during the analysis process but this appears to have been done at the point of identifying the meaning aspect of the conceptions rather than the structural aspect (Herschell 1999).

This phase again took some time to complete. The researcher analysed one conception at a time exploring each one to discover the layers of awareness in the managers' conceptions of information use (Marton 1996: 179). In other words the researcher sought to find what was at the core of or focal to the different conceptions. A period of at least a week was left between the analysis of the structural dimension of each conception and a further two weeks lapsed until the structural dimensions were tentatively confirmed. At this point it seemed that the iterative process of analysis especially between the phases of discovering the meaning and structural aspects of the conceptions might reasonably be expected to have been completed.

Phase 4: Discerning the subject-object relations of the conceptions

Purpose: to describe the subject-object, or intentional, relations of the different conceptions of information use.

Guiding questions: How does the object appear in each of the categories of description? How are the different subject-object relations revealed and described in the data?

Process used: In this phase the categories of description were finalised by bringing together the meaning and structural aspects of each conception. It became clear that the object of the subject-object relations, or the internal human-world relations, was information and that the conceptions of information use reveal the relations between people and information. The description of the relation in terms of its meaning and structural dimensions, and its label formed the category of description that denoted each conception (Bruce 1997a: 105).

Phase 5: Establishing the outcome space of the conceptions

Purpose: to identify the relationships among the categories of description in order to denote the qualitatively different ways in which the phenomenon of information use is experienced.

Guiding questions: What is the logical relation among the categories of description?

Process used: The internal structure of the conceptions as expressed in the referential or meaning and structural dimensions of each one was analysed and the analysis used as a basis for constructing the outcome space 'from the point of view of logic' (Marton 1981: 167). Following Bruce (1997a: 106) the construction of the outcome space relied on a 'three tier approach' dependent on the meaning dimension, the structural dimension and the varying views of information. This process of analysis was again an iterative one during which the categories of description were revisited, confirmed and clarified. The outcome space reflected the structural framework of the understandings of the phenomenon of information use as it was uncovered in the process of identifying the conceptions of information use, describing the categories and exploring the logic of the outcome space. To this extent, the outcome space represented the phenomenon of information use as it was understood and experienced by the managers participating in the study.

Indicators of the quality of the study

The quality of a research study should permeate the entire study from the point of deciding the research questions, through the development and implementation of the research design to the reporting of the outcomes of the study, acting on any responses to the study and evaluating its impact on any further research or on practice. It is beyond the scope of the present study to observe the impact of the outcomes because of the time lag involved and also to act on any responses to it because of the constraints in making the outcomes widely known prior to the examination of the thesis that is based on the study. The researcher intends to open the study to wide scrutiny by the research and practice communities in information science as soon as possible after the examination of the thesis by experts in their fields.

There are two distinct but related areas where the quality of a study that adopts phenomenography as its research approach is evident. The first is related to the knowledge interest of phenomenography, that is to the focus on the variation in people's experience of a phenomenon, and the second to the way the study unfolds. The researcher adapted a set of guidelines for the conduct of a phenomenographic study (Ashworth and Lucas 2000) to serve as indicators of quality. These indicators are informed by the notion of trustworthiness as proposed for naturalistic inquiry by Lincoln and Guba (1985) and Guba and Lincoln (1994). The imperatives for research to be credible, transferable, dependable, confirmable and authentic apply also to phenomenological and phenomenographic studies. The researcher was unable to locate similar guidelines for ensuring conformity to the knowledge interest of phenomenography so indicators were developed for that purpose.

The indicators of quality are listed in Figure 8 below and a comment on some indicators drawn from the literature is then offered in the text that follows. The indicators will be applied in the concluding Chapter of the thesis so that readers can determine for themselves the level of confidence that they can place in the conclusions that are drawn from the study and evaluate the quality of the study and the thesis.

Figure 8

Indicators of the quality of the study

Set 1: Guidelines for establishing that the study conforms to the knowledge interest of phenomenography
i. The outcomes of a phenomenographic study should demonstrate the relation between the meaning and structural dimensions of the categories of description that denote the conceptions.

ii. The conceptions that are discovered in the data should reflect the internal subject-object relations or human-world relations.

Set 2: Guidelines for ensuring the rigorous conduct of the study

iii. The researcher should tentatively identify the broad objectives of the research and the phenomenon under investigation, recognising that the meaning of this area might be quite different for the research participants.
iv. The selection of research participants should avoid suppositions about the nature of the phenomenon or the nature of conceptions held by different types of people while observing commonsense precautions about maintaining variety of experience.
v. The most appropriate means of obtaining an account should be identified allowing maximum freedom for the participant to describe their experience.
vi. In obtaining experiential accounts the participants should be given the maximum opportunity to reflect. The questions posed should not be based on researcher presumptions about the phenomenon or the participants but should emerge out of the interest to make clear the participants' experiences.
vii. The researcher's interviewing skills should be subject to ongoing review and change made to interview practice if necessary.
viii. The transcripts of the interview should be aimed at accurately reflecting the emotions and emphases of the participants.
ix. The analysis should continue to be aware of the importation of presuppositions and be carried out with the maximum exercise of empathic understanding.
x. Analysis should avoid premature closure for the sake of producing logically and hierarchically related categories of description.
xi. The process of analysis should be sufficiently clearly described to allow the reader to evaluate the attempt to achieve bracketing and empathy and trace the process by which the findings emerged.

Set 1: Guidelines for establishing that the study conforms to the knowledge interest of phenomenography

The purpose in adopting phenomenography as the research approach for the study is so that the different conceptions of a phenomenon or the qualitatively different ways of experiencing an aspect of reality can be described and the relation between information and people can be explored further.

i. *The outcomes of a phenomenographic study should demonstrate the relation between the meaning and structural dimensions of the categories of description that denote the conceptions.*

The development of the outcome space is itself evidence of the appropriateness of the categories of description that comprise it. The analysis of the managers' experiences of information use is couched in terms of the referential, or meaning, and structural, or focal, dimensions of the categories of description.

ii. *The conceptions that are discovered in the data should reflect the internal subject-object relations or human-world relations.*

The focus of the study is the variation in managers' experiences of information use. On the basis of Bruce's (1997a) study it is possible that the subject-object relations discovered in the data will be those among people and information even though it is the phenomenon of information use that is the focus of the study. The nature of these relations will be reflected in the categories of description and the outcome space.

Set 2: Guidelines for ensuring the rigorous conduct of the study

These guidelines are designed to address the difficulties of entering the experienced life world of the research participants. They imply some strategies for bracketing presuppositions and developing empathy (Ashworth and Lucas 2000). To this extent these indicators will ensure that the conceptions that are revealed and described are as faithful as possible to the varied understandings and meanings of the phenomenon of information use that the participating managers ascribe to it.

Fidelity to the managers' experiences of information use is not only a requirement for rigour in the study but it is also an ethical matter. Sandberg (1997) favours the phenomenological reduction of Ihde (cited in Sandberg 1994: 67-69; Sandberg 1977: 209-210) as a way of achieving interpretative awareness. There are certain steps that a researcher can take to achieve this reduction: orienting oneself to the phenomenon as and how it appears throughout the research, orienting oneself to describing rather than explaining, treating all aspects of the lived experience of the participants as equally important, searching for the basic meaning dimension of the variation in conceptions of reality until they have stabilised, and using intentionality as a correlational rule in explicating the variation in the conceptions (Sandberg 1997: 210). This last step involves the researcher in bringing together three related strands of the analysis in a way that mirrors the knowledge interest of phenomenography: the referential or meaning aspect, the structural or focal aspect and relating the two aspects together.

i. *The researcher should tentatively identify the broad objectives of the research and the phenomenon under investigation, recognising that the meaning of the phenomenon might be quite different for the research participants.*

Variation in the meaning of information use is expected on the basis of the literature that has been analysed during the development of the study. The researcher can use a number of strategies for familiarising the participating managers with the broad objectives of the study. These include sending printed information about the study to participants prior to interviewing them, describing the purpose of the study to the participants at the beginning of and during the interviews and confirming the researcher's interpretations of the participants' meanings during the course of the interviews. Another strategy for the researcher is to avoid indicating what she understands the phenomenon of information use to be or recounting any of her own experiences of information use.

ii. *The selection of research participants should avoid suppositions about the nature of the phenomenon or the nature of conceptions held by different types of people while observing commonsense precautions about maintaining variety of experience.*

The analysis of the literature led to the selection of managers as participants in the study. The organisations from which the participating managers were drawn varied considerably in terms of their size and the scope of their programs and the resources available to them. It could be expected that the experiences of the managers within each organisation would vary because of their different portfolio responsibilities and also vary across the organisations because of differences in their programs and responsibilities.

Although the researcher analysed the literature she had no knowledge of the meaning that the participating managers would ascribe to the phenomenon of information use. A strategy available to the researcher for avoiding suppositions about the nature of information use is to refer consistently in correspondence with the managers and during the interviews to either 'information' and 'information use' and not use alternate or related terms such as 'data', 'knowledge' or 'wisdom'.

iii. *The most appropriate means of obtaining an account should be identified allowing maximum freedom for the participant to describe their experience.*

Interviews were judged to be the most appropriate means of obtaining accounts from the participating managers. They were chosen in preference to written accounts or journals because of the immediacy that they offered the researcher and because of the demands on the managers' time, focus and energies.

iv. *In obtaining experiential accounts the participants should be given the maximum opportunity to reflect. The questions posed should not be based on researcher presumptions about the phenomenon or the participants but should emerge out of the interest to make clear the participants' experiences.*

The interviews, or experiential accounts were conceived by the researcher as a peer-to-peer conversation about shared concerns rather than as interrogations (Brenner 1985;

Seidman 1991). The researcher's role was intended to be that of a facilitator with the task of encouraging the managers to make their thinking and reflections about information use explicit (Francis 1993: 70).

v. *The researcher's interviewing skills should be subject to ongoing review and change made to interview practice if necessary.*

A self-assessment of the researcher's interview skills was made initially during the pilot study and feedback was sought from the managers interviewed during that stage. It is evident that the researcher monitored her interviewing skills during the study and made changes to her interview practice as the study unfolded.

vi. *The transcripts of the interview should be aimed at accurately reflecting the emotions and emphases of the participants.*

This indicator relies on the skills of both the transcriber and the researcher. Strategies for the researcher include listening to the tapes while reading the corresponding transcripts, annotating the transcripts where necessary to indicate particular emotions and emphases and recording impressionistic observations in a notebook immediately after each interview to capture features of the interview that might not have been recorded on tape, particularly non-verbal cues, such as gestures and body language.

vii. *The analysis should continue to be aware of the importation of presuppositions and be carried out with the maximum exercise of empathic understanding.*

The describing orientation recommended by Sandberg (1997) guards against explanation based on presuppositions by keeping the researcher's interpretation within the bounds of the participants' experiences. As preparation for the study the researcher reviewed the literature on interviewing and active listening to enhance her entry to the managers' worlds without imposing her own experiences on those worlds (Kvale 1994, Holstein and Gubrium 1997).

viii. *Analysis should avoid premature closure for the sake of producing logically and hierarchically related categories of description.*

This indicator suggests that a researcher might be tempted by premature closure. The researcher is obliged to continue the analysis, moving between conceptions and categories of description until all the evidence is exhausted. The researcher can guard against premature closure by making space between the various stages in the analysis in order to return to the transcripts, tapes and notes from some distance with refreshed energy and perceptive eyes and ears. Recalling the approach to data analysis in grounded theory (Richardson 1999) the researcher will also need to diligently seek alternative interpretations and explore alternative relations between the categories until some stability emerges in the interpretation and relations.

ix. *The process of analysis should be sufficiently clearly described to allow the reader to evaluate the attempt to achieve bracketing and empathy and trace the process by which the findings emerged.*

This indicator will assist in establishing the confirmability and authenticity of the study in addition to allowing other researchers to judge the researcher's success in bracketing or achieving epoché. These methods differ according the stage of the research process. Francis (1993: 73) draws a distinction between the ideas that are bracketed in the gathering of the data and in the analysis of it: in the interview they relate to the faithful recording and reporting of the participant's experience whereas in the analysis of the data they relate to the researcher's understanding of the phenomenon.

Summary

This Chapter has outlined the methodological framework of the empirical study of information use using a phenomenographic approach. It has described in detail the processes, strategies and techniques used in preparing the study and confirming the choice of the research approach, designing the study and implementing it as well as analysing the participants' accounts of their experiences of information use provided during interviews. Chapter 6 that follows outlines the conceptions of information use that were revealed in the experiential accounts of information use and the categories of description that denote the conceptions. The Chapter also includes a diagram of the outcome space that denotes the phenomenon of information use as experienced by the managers who participated in the study.

Chapter 6

Analysing experiences of information use

This Chapter presents the analysis of the data gathered from the managers who participated in the empirical study. The analysis followed the protocols outlined in the previous Chapter and is presented here in the form typical of studies that rely on phenomenography as the research approach. There are two topics addressed in this Chapter:

- categories of description of information use
- the outcome space

The conclusions and implications drawn from the analysis are presented in the following Chapter along with responses to the research questions that shaped the study and advanced the thesis.

Categories of description

Five qualitatively different categories of description emerged from the interviews with the fifteen managers who participated in the study. The referential, or meaning, dimension and the structural, or focal, dimension of each category is outlined. As much as possible the words of the managers are used as evidence of the conceptions that the researcher discerned from the discourse of the interviews. Each direct quote from a manager is referenced to an interview number, its page location in the transcript of the interview and the manager's designation as either a division or branch manager. The division manager is organisationally closer to the chief executive officer than the branch manager but both are members of the organisations senior management group.

The five categories of description discerned from the data as denoting five qualitatively different conceptions of information use are:

- Category one: the information packaging conception
- Category two: the information flow conception
- Category three: the new knowledge and insights conception
- Category four: the shaping judgements conception
- Category five: the influencing others conception

These categories describe the essential features that distinguish each conception. During the analysis of the data it became clear that the internal subject-object relation central to each conception is a relation between people and information rather than a relation between people and information use. It is this relation that informs the referential and structural dimensions of each conception and the relationships among the conceptions. The relation between people and information also enables the construction of the outcome space and to this extent it confirms the efficacy of the categories of description.

Category one: the information packaging conception

Information use is experienced as the packaging of information in this conception. The referential and structural dimensions of the conception that emerged from the analysis of the interviews with the participating managers are presented in the following section of the thesis.

Referential dimension

Three elements of the referential dimension were revealed in the interview tapes and transcripts. They are:

- information packages are objects
- the process of packaging information has different phases

- the process of packaging information can sometimes be a frustrating one.

Each of these elements is now described using examples and illustrations from the interviews with managers, documents they gave the researcher and notes taken at the time of the interviews. The selected examples and illustrations provide the evidence for the meanings attributed by the researcher to this category of description and so they allow others to verify the researcher's interpretation of that evidence.

Information packages are objects

The information packages that managers spoke about were varied but the one feature they had in common was that they were regarded as physical entities. Some of the information packages were in paper-based form, others in digital form; some were text-based, others image-based; some had been published, others were in draft form waiting publication; some had been distributed beyond the organisations, others were for internal use only; some were widely available, others were confidential to particular people in the organisations; some had been completed some time ago, others had the status of works-in-progress. Among the information packages that the managers were responsible for producing were:

- a promotional brochure seeking funding for a major project
- an annual report to government on an aspect of the organisation's programs
- a policy paper analysing a proposed new direction for the organisation
- a proposal for an enterprise agreement for senior executives
- meeting papers for a committee
- a discussion paper proposing a new program
- a report on the restructure of some sections of a branch
- an operational plan for an organisational unit
- two strategic management plans, one for the organisation's technology infrastructure and the other for the management of the organisation's assets

- an issues paper outlining a new direction for the organisation
- a guide to the portrayal of people with disabilities
- documentation of the digitisation of archival documents.

Most of the managers who understood information use in this category gave documents of some kind to the researcher at some stage during the interviews. In some instances this occurred at the start of the interview and the documents were used by the managers as reminders in relating their experiences of information use. In other instances it occurred during the course of the interviews as a way of drawing attention to particular aspects of the experience of information use. In yet other instances it occurred at the end of the interviews for the researcher's reference at a later time. In one interview the researcher was taken through a document as the manager explained its development in considerable detail pointing frequently to particular sections of the document and reading parts of it out loud to the researcher.

Several managers spoke of their experiences of packaging information without giving the researcher any documents at all. An information package that one manager talked about in the interview was mounted on the web and while it was shown on the manager's computer during the interview no pages were printed for the researcher's reference. Another information package in the form of a guide book was waiting publication prior to its launch and could not be made available to the researcher, nor could a discussion paper that was in the process of being prepared by a consultant external to the organisation.

The process of packaging information has different phases

The process was characterised by one manager as essentially one of 'being able to get information in, manipulate it around and put it back out again' (Interview 11, page 9: division manager). While this description suggests that the process has three distinct phases, it is not necessarily seen as a straightforward one. The experience of the process as simple or complex, linear or iterative is to a large extent dependent on the nature of the information package and what it is expected to achieve for the manager and the organisation.

Two examples from the interviews illustrate different levels of complexity experienced by managers in the process of packaging information. In the first example the manager coordinated the preparation of a proposal for an enterprise agreement for senior executives in the organisation. He was aware that agreements devised for organisations in the private sector were not necessarily applicable to public sector organisations because of the different funding bases and the need for different kinds of rewards and incentives for senior managers. For this manager the information packaging process was relatively straightforward:

> The goal was to write a document that would outline the new terms and conditions. So we set up two things to gather information that would go into that document…We employed a [remuneration] consultant so we were pulling in information from the marketplace…the second thing we did was to form a senior executive reference group. It was a broad range of very senior managers…we had three meetings and gathered their thoughts. We took the information from the consultant and we processed it in the group then we modified the proposal according to what the group said, and it did get modified. [Handing the researcher the document] this is the [organisation's] proposal for senior executives and excluding appendices it's about 23 pages long and the contents of that booklet and the information that's in there is a function of taking the advice we were getting from the consultant and processing it with our own people and modifying it till it fitted the [organisation]…this document now needs decision (Interview 7, pages 5-8: branch manager).

By contrast, the second example draws attention to the complexities of the process. The manager was responsible for developing a coherent technology strategy and plan for the organisation, a task requiring a wide variety of information sources inside and outside the organisation as well as the packaging of information in a format prescribed by government. The strategy and its development have a far-reaching impact on the organisation not only for its programs and services but also for its funding:

> We really needed to work out what the kind of strategy was that we were going to adopt, therefore what were the goals of the organisation in its operation, its own strategic plan,

> how did IT fit into that, how could we deliver those goals, what kind of structure could I put into the [division] to try to support the goals rather than just putting in a structure for the sake of a structure (Interview 12, page 5: division manager).

The process of developing the information package in this instance was an iterative one. The manager carried out an analysis informed by different sources including senior work colleagues and the chief executive officer, colleagues in the division, contacts in government and industry, organisational documents and research, literature searches, business managers in the organisation's supplier firms, an overseas study tour, current awareness services and the organisation's benefactors. The plan was developed in several stages with constant reference to the organisation's mission and goals (Interview 5, pages 7-11, 13-14: division manager). Comment on various draft versions of the plan was sought from people inside and outside the organisation and 'a lot of time [was spent] doing it in the format that [government] wants it' (Interview 12, page 15: division manager).

Regardless of the simplicity or complexity of the process of packaging information it is seen to have three different phases to it. These have been labelled as: getting information in, manipulating information around and putting information back out. These labels draw on the language of one of the participating managers, modified slightly to conform to the demands of heading statements. However, the verb form of the manager's expression has been maintained to reflect the active, physical nature of the information packaging process. Each of the three phases is described in the following section with a focus on the unique features of each phase as experienced by some of the participating managers.

Getting the information in

In speaking about their experiences of information use as packaging information managers were concerned about the sources of information that they used and the quality of information that they gathered.

<u>Sources of information</u> The sources of information used in packaging information are diverse in terms of their locations and their forms. Some of the sources are external to the

organisation in the sense that they are located beyond the organisation and others are internal to the organisation. Some sources, such as published literature and reports, are formal in that they have been subject to a publication process and others, such as working documents, colleagues in the organisation and contacts in the managers' networks, are informal.

The external sources used by the participating managers included consultants, the Internet and published documents. One manager, when preparing a list of consulting firms that might be commissioned to write a discussion paper, 'cruised the Internet for workforce planning/workplace reform sites'. He then made contact with these sites by telephone and miming the holding of a telephone to his right ear he said ' I wonder if you wouldn't mind just answering a question that might seem a bit cheeky but it's really a valid one: who else does this?' (Interview 7, page 3: branch manager).

A similar approach to external sources was adopted by another manager in describing a model of differentiated service levels being implemented in the branch she manages. In this example the sources are primarily formal and the manager used them when she was trying to find out:

> …what was happening across the world by looking at library literature and management literature and at research that's been done elsewhere, what clients are expecting of service, so that's been looking for information wherever it might be (Interview 6, page 18: branch manager).

Keen to avoid 'reinventing the wheel all the time with information' another manager looked at what other similar organisations had produced and published in the program area for which she was responsible (Interview 8, page 13: branch manager).

Among the internal sources are strategic plans, working documents and members of staff. In describing her approach to developing a report one manager:

> …used input from the statistics that we collect, our Annual Report, discussion with managers, their operational plans and just what the overall strategic direction is that the government wants us to go in…(Interview 10, page 4: division manager).

In developing a program another manager:

> …gathered all this information [showing the researcher a collection of papers] about tours that people…were using and had been officially published or whatever, and I was amazed at what came out of the woodwork (Interview 8, pages 11-12: branch manager).

Some managers indicated concern for the people that they collected information from in the process of developing packages. In regularly producing an annual report one of the managers has tried over the years to 'refine the collection of information in the [program areas] and …not make it too onerous for them' (Interview 5, page 18: division manager). Another manager developed a proforma to assist other people submitting funding applications and at the same time enabling her to more easily produce an accountability statement and audit report:

> …we came up with keep it simple. It's a one page application form, there's only that much room [holding the thumb and forefinger of her right hand about 10 centimetres apart] where they can fill in what their project is, so they tick the box or boxes and they write in two or three lines about what it is they're going to do. That comes in, it's signed off…goes on file. We put it on a spreadsheet [for auditing]…(Interview 13, pages 22-23: branch manager).

In some instances the sources used were a combination of both internal and external sources. One manager spoke about the range of information sources that she called on when producing a briefing paper for the organisation's governing body on the legal standing and structure of regional groups that are major clients of the organisation:

> …we sought legal advice, this is where we're starting to seek information, quite apart from looking at the [legislative] Act, going and looking at the files, the administrative files here to see if there were any previous precedent letters…we used the Ministry that has a legal person who works with them and the Crown Solicitor…the information that was gathered and used was partly using information in people's heads so the legal expertise, looking at files. I didn't do much in the way of reviewing what [others] were doing because I was really dealing with a difficult situation right here, very localised and very particular (Interview 13, pages 5-6: branch manager).

In another example where a manager relied on a combination of external and internal sources, she approached the preparation of a discussion paper on commercialising one of the organisation's programs as a 'genuine academic research exercise'. The paper had been requested by the organisation's governing body. The manager described the initial phase of getting information in as:

> …a two-fold [process]. I had conversations with other senior managers here, people involved in [the program]. People involved with business development across the other areas, people who'd been involved in a [previous commercial venture] that the organisation had gone through somewhat disastrously a few years before…we talked to a lot of industry players, we got a lot of stock market analysis, a lot of international research, a lot of comparison with other [organisations in our sector] (Interview 2, pages 3-4: division manager).

<u>Quality of information</u> An important consideration in gathering information is the quality of the sources and the information gathered from them. The criteria for determining quality varied from the credentials of the source to the accuracy of the information itself.

The manager who commissioned a discussion paper on the impact of digitisation on the workforce was faced with the dilemma of wanting to engage a consultant with:

> …a credible, established track record that would really both give us the quality we wanted and the credibility we wanted [while at the same time finding it hard]…to write a criteria [for selection] into a brief that says don't bother applying unless you're really elitist and all the rest of it (Interview 7, page 4: branch manager).

However the manager felt that his approach of using the Internet to locate possible consultants and then the telephone to confirm the names of consultants who were later invited to respond to the brief for the discussion paper had in fact produced 'the right names and addresses'. As a result his organisation got 'the best [information] we knew of' to work with' (Interview 7, pages 10-11: branch manager).

One manager appreciated the danger of packaging information of poor quality when reflecting on her experience of information use. She observed during the interview that:

> …another thing that happens when one is involved in gathering and organising and disseminating information is keeping the momentum going, maintaining or establishing the accuracy or otherwise of the information that you've got which was an interesting aspect of this because we could check with [a staff member]. He wrote a book about [the organisation] and has a fairly good idea about our history but a lot of the information I gathered was not accurate (Interview 8, page 12: branch manager).

There were then two sets of criteria used for assessing the quality of information by some of the managers interviewed. One set is related to the quality of information sources and it rests on the assumption that the quality of the information sources and the information they carry is consistent. The other set is related to the information itself and it rests on the validity of the information used.

Manipulating information around

In this phase of the information packaging the participating managers drew attention to two features: the actions they performed and their sense of audience, or the people for whom the information package was intended.

<u>Manipulating actions</u> The actions that the managers attributed to this phase were mainly actions associated with observable behaviour. Although these actions are noteworthy for their physicality, manipulating information is an activity that draws also on cognitive and affective processes. However action words and phases predominate. Some examples that illustrate this point include: 'needing to get the information bedded down into a fairly concrete form' (Interview 11, page 19: division manager), 'I did a lot of the gathering or compiling, pulling together…the documentation' (Interview 13, page 26: branch manager), 'What I did…was help pull together a report with three different options for the [governing body]' (Interview 13, page 7: branch manager).

One manager demonstrated her actual use of the electronic whiteboard in her office during the interview when she was outlining the steps that she followed in compiling the annual report for government on the program for which she is responsible. Relying on the twelve monthly reports that she prepares for her supervisor during the year, the manager draws a table on the whiteboard using sections of the legislation as an organiser:

> …I just take all the bits so when I get my monthly reports I get a big whiteboard and I put [up] these sections of the Act and I go through the twelve months and I fit [highlights from each report] under each [heading]. At the same time I fit them under the modules [of the management plan]. So teleworking [pointing to a section in one of the monthly reports], that would go under Consideration of Policies and the Examination of Practices. It would also go under some of the modules like it would go under the disability one 'cause it can assist people with disabilities to work full time and it would also go under Work and Life for people with family responsibilities so I just put it where it fits…there's not a lot of room on the whiteboard and you're [demonstrates moving the screen backwards and forwards using the screen control buttons] and you're pressing back [because of the cramped conditions in the office] (Interview 5, page 6: division manager).

This manager also included in the annual report photographs that had been taken throughout the year and they too were placed on the whiteboard in appropriate places. The actual assembling of the annual report took place over a two week period (Interview 5, page 4: division manager).

Even when speaking about the intellectual demands of packaging information some managers used action words. For example, one manager reflecting on her contribution to the implementation of differentiated service levels and the development of documentation remarked that:

> …it tends to be me who synthesises what information there is and then I just go and talk about it with [my colleague]…I wake up in the middle of the night and just try to think how can I pull this down into something that is manageable…what I'm trying to do is to reduce choice, reduce something to its essence (Interview 6, page 18: branch manager).

<u>Sense of audience</u> An important consideration in manipulating information is the intended audience for the information package. A sense of the audience shapes the overall

approach taken to compiling the information package. Sometimes the audience is more clearly identifiable than at other times. For example, one manager made a submission for funding from a particular national agency and in doing so she worked closely with a couple of her colleagues in the organisation:

> [My colleagues] are very good with words but they're not necessarily very good at putting the words into the form that you have to put them in when you're applying for a grant because you've got to understand what the grant will give back to the granting organisation. What they're going to get out of it because that's the trick of applying. It's like writing an assignment. It's the same sort of technique I suppose. It's just knowing what you think the picture's going to be (Interview 11, page 17: division manager).

In the event the submission was not successful. As the manager explained:

> …we didn't emphasise enough I don't think the national nature of what we were on about. That might have made a difference so to an extent we misread it… the connections they weren't there because I think a lot of that sort of thing is just clicking into someone else's imagination at the time and if you do it that's fantastic but if you don't you just miss the opportunity (Interview 11, pages 17-18 18: division manager).

By contrast the manager who had collected a lot of information on visitor tours provided by the organisation gave an example of the consequences of preparing an information package without having a clear sense of the audience. She explained:

> One of the things as far as information is concerned I had to think about was: what is it we want people to achieve or have when they come on a tour? We hadn't even thought about what sort of information we wanted to impart. We hadn't thought about our target audiences, we hadn't thought about any number of things so what we were doing was doing a sort of scatter gun approach for the information that came into us and scatter gunning the information that went out. I think sometimes it's surprising it works as well as it does (Interview 8, pages 12-13: branch manager).

The impact of a sense of the audience on the way a manager works with information is illustrated in the following reflection by one of the managers interviewed. It was this manager who introduced the notion of differentiated levels of service to the branch she managed and it was later to underpin the integration of two branches in the organisation and the restructure of another branch. Here she is speaking about a paper that she wrote for the organisation's executive that proposed the different service levels:

> What I've realised is that I've been surprised at the bits of it that have been picked out by members of the executive and I'm still getting used to that and I now fiddle around. I think I fiddle around too much writing something because I'm trying to figure out how people will be thinking, how they will react to it, for various people what their reactions might be when they look at it (Interview 6, page 19: branch manager).

Awareness of the audience influences not only what managers do when manipulating information but also why they manipulate it in the ways they do so. It can be useful to a manager to acknowledge some of the constraints under which an audience operates. In this instance a manager acknowledges the demands made on the audience of an information package she prepared:

> …that [information package] actually had to go to the Minister so this is not a small matter in the scheme of things…All the documentation had to be gathered. A very neat synthesis had to be written that could be absorbed quickly by busy [governing body] people and then indeed up through to the policy advisers to the Minister (Interview 13, page 8: branch manager).

As well as maintaining a sense of audience the managers also address the needs of the organisation in some of the information packages. In this sense there are two audiences for the information packages, one external to the organisation and the other internal to it. One manager preparing a strategic plan that has implications for the funding of the organisation spoke about the executive group of the organisation having to find a way of:

> …dealing with what needed to be in there from [the government's] point of view in a document that was still a living document from our point of view. (Interview 12, page 8: division manager).

The manager who coordinated the development of an enterprise agreement for senior executives graphically described the strategy he used to ensure that the document would meet the needs of the organisation:

> …we got information that we thought was pretty good to start with because we got that from the consultant and that's what's going out in the market. It might not be ideal but it was the best we knew of, but then we knew we had to do something with that information so we processed it. We put it through the tumble dryer and we saw which way it fell out by processing it with that group [in the organisation]. So we really modified the information by consulting [our] people (Interview 7, page 11: branch manager).

A sense of audience then needs to extend beyond the immediate in some instances especially where information packages have multiple audiences both inside and outside the organisation. For people inside the organisation some information packages are very much working documents that need to reflect the character of the organisation.

Putting information back out

In this third and final phase of the information packaging process the managers who experienced information use in this way considered multiple purposes of the information packages as well as the format and presentation style of them.

<u>Purpose of the information packages</u> Some of the managers referred to different uses of the information packages. Within the organisation the packages might be used as a benchmarking tool, an information source for others and a record for the purposes of accountability. An annual report, for example, was tabled in Parliament as required by law, but the document itself was also:

> …sent to some libraries, we give it to staff, Human Rights Commission…and then if anyone wants it because it's a public document they can have it. It's actually also a very good tool in that if people ring me up, as you get so many calls from a whole lot of people, internally and externally and they say, oh I'm studying this, I'm doing this or doing benchmarking or whatever I just send them a copy…it's good to have something that shows people what's been achieved…and at workshops it's good to have something…because it's a tool that's why I try to get so much in. It actually saves me work and things through the year…(Interview 5, pages 8-9, 11: division manager).

Another example is a brochure setting out the organisation's major directions for the next decade. Designed to attract sponsors and partners, it was described by the manager who coordinated its development as ‘quite a magnificent document’ (Interview 11, page 13: division manager). The manager suggested that the documentation supporting the production of the brochure could be:

> …used to see if you’re still heading in the right direction. I suppose in hindsight you could use it to look at where you thought you were going and did you get there. I’d have to say at the moment there’s not that much difference between what we thought we wanted to achieve and the path…(Interview 5, page 20: division manager).

<u>Format of information packages</u> The format is sometimes outlined by agencies for which information is being packaged. For example, one division manager was provided with a resource booklet that set out the structure of a plan and the framework for key result areas. In developing the particular plan for the organisation she selected the policies and services that supported the plan, putting them into the:

> …standard format which is strategies, who does it, how much we spend and some performance indicators…the rough outline is provided with these three key result areas but then the content of it I made up basically…we came up with these initiatives and fitted them into those key result areas (Interview 10, pages 3-4: division manager).

This organisation is required to report annually on the plan to the agency and to include highlights in its own annual report to government. In reporting to the agency:

> …we fill in all the boxes with what we’ve done with statistics and then write a written report in prose identifying the particular highlights and then that goes to [the agency] then they produce an annual report on the government’s achievements in [this particular area] (Interview 10, page 4: division manager).

Similarly another manager who prepares an annual report for government on the program area for which she is responsible also used a standard format. In her words:

> I suppose with the annual report I’ve got a bit of a formula there in terms of I do that each year and therefore I can build on what I’ve done in each report and I can quite often use the same words with just a little bit of revision to some bits of it which actually assists the whole process to go forward (Interview 5, page 17: division manager).

The notion of building an information package is not unusual among the managers interviewed and it is a further reminder of the active and highly physical nature of the information packaging process. For one of the managers already referred to in this section:

> The first year was probably the hardest because I had to build it up from nothing…this is probably an example of overkill in a way but we choose to play the game. I suppose that if you have to report on this stuff we report on what we want to tell them but obviously it has to be within a framework that's required…All of the stuff here I built up from stuff that I knew we had so I didn't write it in the expectation that I'd be asking people to collect new information…(Interview 10, page 5: division manager).

Although the use of a specified or standardised format suggests that this part of the information packaging process might be to some extent routine it does not mean that it is a mechanical one demanding little attention. The managers who spoke about using a prescribed format were aware of the need to adapt the information package to changing circumstances. One manager changed the structure of the annual report in her program area from a focus on targeted equity groups to one on the management plan that she had developed during the year. During the interview this division manager drew the researcher's attention to the changes she had made to the headings used to structure the plan by pointing to sections of the text that she had written (Interview 5, page 5: division manager).

Another manager at one point in the interview described the process of preparing a plan or statement on one of the organisation's programs as '…tedious because it's here we go, here's another one…' (Interview 10, page 17: division manager). She cautioned that:

> …in subsequent years of course it becomes less difficult although you need to be careful that you're not becoming complacent, say oh, I've done that, because obviously things do change over time and the way you might want to interpret something or report on it can change as well. So, yes, it's important to obviously I guess know which way the organisation is going and what our priorities are too so that we can make the shift (Interview 10, page 6: division manager).

Despite the rather routine nature of preparing the plan, this manager likened it to:

> …a bit like doing a jigsaw puzzle, crossword or something where you start out with this sort of model and you make it fit. You can make it as big or little as you want. While it's time intensive and you have to get your head around some of those concepts it's not all that difficult really to put something together like that…it's more of a game…it's more comfortable, particularly when it comes to filling in the boxes at the end. I like adding up the numbers, doing the percentages and saying 'Wow!' (Interview, 10, page 17: division manager).

Presentation style The 'look and feel' of an information package as well as its linguistic style are important considerations in this phase of the process, particularly as it relates to the intended audience for the information package. In one instance a manager reported on the development of a guide for people keen to reflect disabled people in the organisation's programs. The person coordinating its development:

> …didn't want it to look like a set of rules or a wordy thing. She wanted it to be in the first person so that people, because it was targeted at [them] would see it as, yes, I can relate to that, it's written in the first person, it's written by a variety of people, variety of views and people who have feelings rather than someone just saying, you know, don't call people with disabilities this or that (Interview 5, page 19: division manager).

The guide also included photographs of the contributors, some of whom were work colleagues or high profile public figures familiar to the guide's intended users. While showing the researcher the document that had been produced, the manager responsible for its development drew attention to its design. The contributions written in the first person by practitioners were interspersed with information pages such as lists of accessible websites and other information sources as well as examples of good practice and positive representations of people with disabilities. The guide is part of a training kit that will eventually include a video and a manager's guide. The kit will be available within the organisation at no cost but will be available externally for a fee (Interview 5, page 13: division manager).

The adoption of a particular style of writing for the information package was mentioned by a number of managers. After gathering information from a variety of sources as part of the process of developing an information technology strategy a division manager faced the challenge of 'trying to put it in a government sort of speak' (Interview 12, page 14; division manager). Another manager referred to a similar style as 'my public service speak writing where you develop all these other skills about how you compile and present information' (Interview 13, page 15: branch manager).

She learned to write in this style over a period of time and commented that she would have been unable to prepare the information package in her first year as a branch manager. She acknowledged that the feedback she had been given on draft documents was very helpful to her in developing this particular style. In addition the opportunities that she had to work more closely with her senior colleagues had allowed her to 'gain information from them. You're starting to see how they think… how they react in a situation, what they see as a sensible resolution' (Interview 6, page 15: branch manager). This manager's learning from her colleagues extends beyond the development of a certain style of writing as she suggests that the discourse reflects ways of thinking and acting.

Another consideration related to the demands imposed by a prescribed format and the discourse of the audience is the clarity of expression and the effort that is sometimes needed to achieve it. Officers in a government agency misunderstood the thrust of a strategic management plan prepared by a division manager. The manager had sought extensive feedback on the plan from her colleagues as it went 'back and forth to the [executive group] quite a lot of times…everybody [had] a go' (Interview 10, page 15: division manager). She spoke about:

> …lots of re-writing and trying to write it in as plain English as possible, you know, taking out all the jargon so it was pretty disappointing to then find that [part of the plan was misinterpreted]…that was really interesting, but a very valuable lesson to learn…because of the audience that you're writing for. So it's constant modification, reworking…ultimately it's spin doctoring in a way isn't it and I guess that's a fair part of what I do…we always have to make sure that what we're saying is sort of relating everything we do to government priorities, to our legislation, to where the future is going and all that kind of stuff. It's that sort of refining and modifying what we're saying and making sure it's consistent and it's strong and hopefully will catch the imagination over the road [in the government offices] (Interview 10, page 13: division manager).

Sometimes an information package needs to conform to the conventions of its format as well as to a particular discourse. For example an issues paper that was approached by the manager who wrote it as an academic research exercise included ‘footnotes and all the rest of it’. In the words of this manager who wrote the paper three or four weeks after her appointment as a division manager:

> I’m told by others that the [governing body] had never seen a paper like it. You know an argued research brief. It didn’t seem to be rocket science to me [at the time] but now I understand the background. I think it’s quite a good document, the strength of the argument is there in the detail…(Interview 2, page 5: division manager).

The process of packaging information can sometimes be a frustrating one

The process of packaging information that has been described with reference to the interviews with the participating managers can be experienced by some managers as very frustrating and several managers reflected on their feelings of anxiety and disappointment. In some instances the process is delayed in ways that suggest that the managers have lost some control over the process. In other instances the process itself underlies the managers’ anxieties and frustrations especially when some of the unique features of the different phases are lacking in some way.

Delays in the process

There were two instances in which delays in the information packaging process occurred. In the first, two managers were required to intervene so that the situation could continue to unfold to its resolution. The managers took control of the process from their work groups. In the second, a manager’s supervisor intervened but the apparent urgency for an information package passed without its ever being developed. Although the supervisor sought to take control it proved to be unnecessary.

The first situation concerned the integration of two branches in the organisation and the preparation of documents identifying the competencies required to deliver different levels of service to the organisation's clients. The preparation of the documents was coordinated by one of the branch managers who relied on the people in the two branches to provide information. As the integration of the branches went on, documents detailing the competencies became longer and longer, more and more dense as some of the staff sought to delay the implementation of the integrated service that had been approved by the organisation's executive group. The information packaging process took on a life of its own. The coordinating manager observed that:

> …there was a lot of this kind of detail going on…of course because there was so much information I suspect that some of it was there [in the files that anyone from the two branches could access] but I'm not sure that it was read (Interview 6, page 4: branch manager).

In order to keep the integration process moving the two branch managers introduced a fortnightly newsletter to the staff so that same information about the integration was getting to people of both branches at the same time. The newsletter generated interest and people followed up some of the articles and news items. Gradually the discussions among the staff were broadened and refocussed on the levels of service rather than on only the gathering of information about the competencies required for service delivery. One of the managers saw the delay as being brought on by what she described as 'analysis paralysis' as a means of delaying inevitable change (Interview 6, page 20: branch manager).

In the second situation the manager led a small team on a project that involved creating access to a collection of digitised images. Part way through the project when it had run into some technical difficulties, he was required by his supervisor to develop an information package in the form of a business plan for the project. He chose to continue with the project rather than devote time and energy to the business plan and within a short period of time the images were accessible through the world wide web. The business plan was not produced, a situation that the manager acknowledges would not now be accepted by the organisation. In his words:

> …it was a really weird situation because we were trying to get this information up [on the web] and we knew that it would be a wonderful thing for the [organisation] to do. It would be a great thing for [our clients]. All these blockages within the system so it was like having to do a business plan, what impact it would have on [the organisation] and it was one of those situations where you were almost stymied by the bureaucratic procedures that were going on within the organisation…as soon as people saw [the images on the web] they forgot about the business plan and all the rest of it. You know, wow, this is fabulous and then we publicised it by putting information out on the web…we got all these complimentary responses to it…Sometimes the creation of a business plan I think is an automatic brake on progress. I know there's got to be a certain amount of thought and planning to go into things but often I sometimes feel that it's a way of not delaying the inevitable but slowing things down and acting as a brake on progress (Interview 14, page 12: branch manager).

One of this manager's colleagues in the same organisation echoed his comments on the place of plans and documentation in innovative projects:

> …if you're not careful that…document can become the overwhelming thing to the detriment of the project that you're on (Interview 11, page 19: division manager).

She did though acknowledge the need for some documentation of projects especially as she herself was moving on from a project and someone else would be required to manage it. Her concern was that an appropriate balance be found between the innovation itself and the record of its planning, implementation and evaluation (Interview 11, page 14: division manager).

The information packaging process

Each phase of the information packaging process presented challenges to some of the participating managers. These challenges highlight the unique features of the processes that were identified by the managers and underpin the meaning attributed to the process and the experience of information use.

<u>Getting the information in</u> The unique features of this phase were the sources of information and its quality and both were seen as challenging by some of the managers.

At the extremes there were either too many sources of information or too few and the quality of the information that was gathered was uncertain.

<u>*Sources of information*</u> One manager was frustrated by the sheer volume of information that was available to her when she was developing a coherent tour program for the organisation using current practices as its basis. It took many different forms from quizzes to maps and from interesting facts to self-help guides. Some of the information was on paper, some on computer discs currently in use in the organisation and some on superseded floppy discs. Some of the information was based on official sources in that they were sanctioned by the organisation and some of it was based on unknown and unreliable sources. Having collected a range of documents from people in the organisation, the manager commented that she:

> …actually felt very defeated because I felt that it was too disparate and everyone in the groups who were involved …had tremendous ownership of their particular type of information and at one point they were not particularly prepared to share it. So I put this [document] together and now it's a simple document that came out to fourteen pages [fanning them from the spine to show the researcher]…(Interview 8, page 12: branch manager).

By contrast another manager experienced a different problem in gathering information. The problem was not one so much of information overload as one of scarcity of information on which a strategic plan could be based. The division manager expected that there would be information about what the branches across the organisation wanted to achieve and their past performance. But she found that:

> …there wasn't a skerrick of information in the organisation on past performance…fundamentally there is nowhere in this organisation where there is any source of documentation, any source of information on what [we are] actually planning to do, any direction or anything else. To try and start…well there isn't any, it's got to be in people's heads if it's not written down, if it's not documented. It's still got to be somewhere, up here [pointing to her head], and the process of trying to extract that information across the organisation was the most extraordinary thing I think I've ever been through where it threatened people, unbelievably threatened them that you might be asking for maybe a few goals, objectives, rationale for what they were doing… That

> information was just absolutely not available…it was basically a red rag to a bull. Total threat, total threat that information should be available, that it should be being kept and managed…there are no real systems in place for any of the goals or aspirations or issues or threats or anything confronting the [program areas]…there's no historical documentation of events, things that actually have an impact on the [organisation]… there's no repository if you like for information or no real need to know (Interview 3, pages 10-12: division manager).

Quality of information The quality of information is associated with the quality of information sources as well as with the information in those sources. The manager who gathered information about visitor tours of the organisations drew a distinction between information that was 'officially sanctioned' and information of uncertain or doubtful provenance (Interview 8, page 12: branch manager). The division manager who faced the challenge of having no information on the performance of the organisation was also concerned about the quality of information that she used in developing plans to support the organisation's entry into online services. Her concern was not so much about the validity of the information that she used but more fundamentally about how judgements of its validity might be made. The manager reflected that:

> …. it's like we're operating pretty much in a vacuum. We have piles of information but none of it appears very real, it's just a lot of suck it and see, what do you think of that, does that make any sense, does that work for us here…We've got lots of stuff to draw on [but] I don't know which parts of it are relevant and which aren't…You read an article. I don't know whether it's sensible or whether it's valid, or whether it's you know, how much of it's propagandish, how much of it's real, no idea and yet a lot of it is because it's new…I don't know, I find it totally…like there's no filtering at all of this stuff, of what is a reasonable thing (Interview 3, page 5: division manager).

Because online services were so new to the organisation there was no one who could validate the information that the manager was using.

Manipulating information around The unique features attributed to this phase were the actions involved in manipulating information and the sense of audience that was implied in the managers actions. The source of frustration for some managers was a misjudgement about the audience that led to the repackaging of information in another way so that it was more readily accessible to the audience.

In one instance a manager prepared a report for the organisation’s executive group outlining an interim structure for the branch she manages. Although the audience was known to the manager and she had prepared papers and reports for the group previously, the rationale given in the reports for the interim structure was not clearly understood by the executive group. The manager was asked to rework the paper for consideration at a following executive group meeting. In some detail in the interview she describes her experience of repackaging the information and finding an alternative framework for its presentation:

> …when we went to the [executive group the first time] it was quite clear that the picture of the scale and complexity of the range of our services and why we were trying to do what we were doing was not as clear as we thought it was…I guess that at that point I decided well, I really need to find a way to package the information that tries to convey the environment that we're operating in, the scale of our services, the drivers that are pushing us to change and so on. How to package that in a way for that audience to be meaningful and not in my words, but in someone else's words…I think it was almost like something important had been leap-frogged but I wasn't aware of that until after I actually got into [that first meeting with the executive group] What I did then after talking about what had been the problems with my [supervising manager] and I guess brooding on it a bit, and having seen some of the documentation from the [differentiated service model] I thought well, I think I can describe our services by that model. It was again really taking information that existed but just repackaging it and trying to find a simple way to present it. So it ended up basically then listing our services [the service levels], putting in some information to describe the services as they are now, what we thought some of the main drivers were, external forces for change, service trends going up or down or whatever, what the resourcing side of it was, whether they were cost recovery, a bit of an idea of that, say the staffing the resources and so on. Then just sort of stuck a summary page on the front page that gave some highlights a bit like what I just said there. It's probably why it trips off the tongue so easily. Then I went back to the following [executive group] meeting with that document plus some additional information that they'd specifically asked for about some of the processes that we intended to use for the next step of our restructuring.
>
> Fortunately, that actually then provoked what to me was an extremely useful discussion on a deeper and broader level…I felt from that experience I gained a huge amount in terms of being very clear then about what the [executive group’s] view would be and also I think from the way in which that report was received I got a strong sense that, yes, the way it was presented was useful for them. It was in a way that they could understand, it was

> presented in a way in terms of how they wanted to be able to take things in. It was able to do that…I think one of the things that made it more useful was I could see immediately that there is intense interest and a lot of questions being asked and comments being made about that broader and more strategic level of services which I think previously the members of the [executive group] who obviously don't work so closely with our [branch] really just didn't have that at the right time to then make the judgements about what we were trying to do in terms of the practical side of the reorganisation. It was able to fill in that gap so it certainly raised the level of awareness and I think an appreciation for the scope and the range of the services that we were providing (Interview 9, pages 5-7: branch manager).

In hindsight the manager was able to see considerable benefit flowing from the repackaged information and the way the audience received it, but at the time the request was made for a revised report she:

> …felt a bit overwhelmed by the work to be done and I guess that sense of I thought I was going to get this reaction and I got something different. So the initial thing is oh, you know, and then you think what am I going to do about it…until you've had a bit of time to reflect on it you have an honest instant reaction. I just wanted to go in there [to the executive group meeting] and they would go tick, tick, tick and then I'll be out of there in five minutes but I think the impact in the sense of engaging attention and interest was really beyond what I expected actually. So I though that was very good. I suppose I also felt very good about being able to come back and report back here to the staff in the [branch] (Interview 9, page 8-9: branch manager).

The manager acknowledged the demanding nature of the situation in which she was using information and summed it up this way:

> You're dealing with a very complex mix of information and structures and culture in the organisation and individuals…[its] very much dealing with something where it's very important to get a certain outcome, something that's fundamentally important to our [branch] and what we're doing, and I guess to me personally to be honest (Interview 9, page 15: branch manager).

<u>Putting information back out</u> The unique features of information packages are their purpose, format and presentation style. It is the format and the style of the discourse of the information package that some managers acknowledged as presenting challenges to them. In the experience of one of the managers these features were also associated with the purpose of the information package in the form of a strategic asset management plan.

Senior officers in a government department did not immediately understand the intent of the plan for the organisation. As the manager explained:

> I guess that what you say and how you write things is really important... it [the plan] was interpreted that we were talking about increasing our services, which is obviously a no-no in terms of asking for money, it's just something that you never do. We know that, but it was how what we wrote was interpreted. That was a really important lesson I suppose to say what we were talking about is how it's being interpreted when you send this stuff off to people who need to receive it, how things are being read and interpreted...(Interview 10, page 11: division manager).

This manager highlighted the capability required in using a discourse that is not only appropriate to the audience but also provides flexibility to the organisation:

> …you just have to be so careful that you're not then held to something when circumstances change. So I guess in terms of survival and funding and resourcing and where we're positioned that this is really, really critical and it's absolutely essential to get it right…to make sure that we say that whatever services we're going to provide then we can maintain the asset to provide it…[The asset includes] buildings one of which is a heritage building, people visiting us and using us from all over the state if not the world, and trying to get that into context and also to try and sell the message that what we do is strategically important. That it's not just about arts and culture, it's also about economic development, social development, social harmony, equity and all those sorts of things as well and that without us, life would be different (Interview 10, pages 14-15: division manager).

Structural dimension

Because the referential and structural dimensions of a conception are dialectically intertwined (Marton and Booth 1997) some of the evidence from the interviews already presented as evidence of the meaning that managers attributed to the phenomenon of information use when it is thematised as information packaging also illustrates the structural dimension of this conception of information use. The structural dimension of a conception reveals the focal awareness and how a conception and its component parts are delimited and related to each other. The structural dimension also elaborates the internal subject-object relation that constitutes the conception.

The internal subject-object relation of the information packaging conception of information use emerged as a relation between people and information rather than a relation between people and information use. In the foreground is information as an object that has a physical presence or surrogate, as in the form of web pages, and the actions and behaviours of people engaged in the process of packaging and repackaging of information in different forms and formats for different audiences. Information in this conception has an existence that is independent of, and external to, the people who use it. Information in its raw state begins to undergo some modification when it is shaped by the purpose and audience of the information package that contains it, that is during the manipulation phase of the information packaging process.

Information and its packages are linked together in an almost linear process that has a defined beginning and end. The beginning of the information packaging process is marked by the gathering or collecting of information for a particular purpose and the end by the presentation of the packaged information to its intended audience or recipient. These beginning and end points are determined in part by the process and also by the engagement of the person using information in the process.

Summary

The experience of information use as information packaging is summarised in Table 8 that follows.

Table 8

Dimensions of the information packaging conception of information use

	Referential dimension	Structural dimension
Information packaging conception	Information use is understood as a process of packaging and repackaging existing information in a different form and format so that it is accessible to others.	What is in the focal awareness is information as an object and the actions associated with assembling information for others. Information is packaged and repackaged in a linear and finite fashion.
Illustrative examples		
The process is one of 'being able to get information in, manipulate it around and put it back out again'. 'I did a lot the gathering and compiling, pulling together…getting things compiled and written and explaining, pulling together the documentation'.		

Category two: the information flow conception

In this conception information use is experienced as enabling the flow of information. As in the previous category of description the referential and structural dimensions of the conception are presented with the actual words of the managers providing evidence of the conception discerned in the data.

Referential dimension

Four elements constituted the referential dimension of the conception of information use as enabling the flow of information. These elements are:

- information flows in different directions
- information flows through different channels
- information flow centres on sharing information with people
- contextual factors shape information flow

These elements are described and illustrated with examples from the interviews with the participating managers. The descriptions and the examples serve as the evidence for the researcher's interpretations of the managers' revelations and reflections on their experiences of information use.

Information flows in different directions

The participating manager's experiences of information use as enabling the flow of information indicate that the flow of information is multidirectional. At its most simple information flow involves a one way transmission of information from a manager as sender to others as recipients, usually inside the organisation. Information is transmitted vertically upwards to a manager's supervisor or an executive group or downwards to a manager's subordinates. Information is also transmitted horizontally from a manager to peers or others on a similar level in the organisation.

A more complex information flow involves a two way flow of information in either vertical or horizontal directions or in both directions at the same time. In this pattern of information flow information is exchanged or communicated rather than transmitted or transferred and the manager is at the hub or intersection of different directions of information flow. In two way information flow the manager is both the transmitter and receiver of information.

Among the participating managers the two way exchange of information was the more usual experience, particularly in situations where feedback is sought from others. It is this more complex information flow that underpins participative management, consultation and communication in organisations. In the interviews several managers reflected on the exchange of information as it concerned them as well as those with whom they shared information.

One of the participating managers initiated a one-way flow of information following an internal inquiry into the activities of one of the people who reported to him. The manager needed to pass on information about the outcomes of the inquiry to other people who reported to him, to his managerial peers and also to groups external to the organisation (Interview 4, pages 6-8: branch manager). Because of the nature of the events that led up to the inquiry the manager was 'sparse' in his communication with staff but he was able to keep the staff in his branch informed of the outcome of the inquiry.

Several managers spoke about a two way vertical direction of information flow in which they provide a link between the executive group and the people in their branch or division. One manager pointed to the organisation's program for volunteers where:

> …you've got this information going two-way and I feed it back to the organisation and they feed it back to the volunteers as much as possible and it's structured (Interview 8, page 20: branch manager).

Another manager depicted herself as being 'quite reliant on an information flow' (Interview 11, page 4: division manager). This manager located herself in the vertical information flow between her supervisor and the colleagues who reported to her and for whom she was responsible:

> I have fortnightly meetings with the [chief executive officer] because she's my direct report and I do an agenda each time based on the previous agenda so that's my trigger to say, oh yes, we've dealt with that one and it's sort of crossed off now. Some things are ongoing obviously but those sort of single issue things come up as an agenda item for her information and then are sort of handed back by me to whomever to deal with them and then I can report them as being done. (Interview 11, page 5: division manager)

Managers describe this particular location in different ways but the idea of being a go-between is common to them all. One referred to herself and her peers as 'that strong link between the executive and staff themselves' (Interview 6, page 14: branch manager). Another saw his role in this regard as ' a bit like WD40 between a range of [groups] unable to slide together …a bit like providing the synapse for the conversation and information particularly to transfer' (Interview 15, page 9: division manager). Yet another manager saw herself as 'bringing the threads together and …being a major conduit' for information (Interview 13, page 3: branch manager).

There are some advantages for the manager's branch or division that derive from the manager's role as a go-between in the flow of information. As one manager explained:

> I felt very good about being able to come back and report back here to the staff in the branch [on our plans for a restructure]…[we're] a bit invisible in the organisation…I guess I've been thinking too about how do we use this and make sure we don't lose that momentum in terms of making sure that the good things we're doing and the positive things about the processes we've been going through are actually widely known (Interview 9, page 9: branch manager).

Information flows through different channels

The channels through which information flows are linear and curvilinear, formal and informal. The formal channels which tend to reflect the linear formal structures represented on organisational charts rely on structured meetings and at times information packages to maintain the flow of information. In contrast the informal channels represented by tools such as sociograms and curvilinear diagrams rely more heavily on interpersonal interactions and mainly on face-to-face exchange of information. In some instances information flows through a mix of channels. For example information flow might be initiated through an informal channel but then continue through formal channels.

The complexity of information flow is illustrated in an example from a division manager responsible for setting a new strategic direction for the organisation. Initially her concern was to set up a 'think tank' to initiate the flow of information about the organisation's web site and to encourage people to exchange information with each other:

> We actually had staff from all over the place who wanted to be there to come along and brainstorm what our website should contain, where it should be and out of that they did sort of mind maps. We put all that together and came out with outcomes which started to form these strategies [hands researcher a document]… We've since gone back to [the staff] this year and said 'Here it is, this is what we've done since the web think tank'… The staff were actually blown away by these forums…The first forum was almost full in [the meeting room] so that would be a hundred and thirty people probably out of a possible hundred and fifty.
>
> …You know you've got a dog when the second forum you run has less people than the first one. This one was standing room only for the second one…One of the strong perceptions at the beginning was that the IT stuff because it had grown like topsy and didn't work together and was old and in some areas and all that stuff…there was a perception and frustration that we weren't really out there, we were no longer a leading organisation even though everybody really thought we were. And there was this real feeling that we'd stopped, stalled and we needed to move and now the perception is hey, we're really going too fast, that sort of thing. So that's a really interesting kind of thing and that's part of the process in terms of information. That's how you feedback in the organisation what you're doing and what's going on too which other people find really fascinating (Interview 12, pages 16-17: division manager)

Other managers also relied on opportunities for face-to-face exchanges of information to enable the flow of information even though the large number of people attending forums and meetings might limit lengthy exchanges. One manager spoke about setting up a staff meeting following a decision taken by the organisation's governing body to relocate significant groups in the organisation in another part of the city. Importantly, this manager was not responsible for any of the groups in a formal reporting sense:

> I realised that no one [on the site scheduled for relocation] had really been briefed about this, so I set up an all-staff meeting… It was a bit of baptism of fire because there were ninety people for this first meeting…I thought it essential that it happened quickly…That was another example when I thought these people are absolutely affected by decisions, potential decisions. They need to actually know where it's at. They need to know where

> it's at from those of us who've been involved in putting it together. It was a pretty hard gig I must say but it was worth doing (Interview 1, pages 9-10: branch manager).

This branch manager spoke about other instances where she had set up similar meetings and invited key personnel within the organisation to address groups of people. The manager was involved in an earlier relocation of the organisation that involved bringing together people, facilities and equipment from eleven sites to one site. As the manager explained:

> I had to invite myself onto the Steering Committee and have myself put on it…I also then set up a body corporate while we were still on the old site representing all the different groups moving in here so we began to work about eighteen months out from moving in. So the body corporate had somebody representing [all parts of the organisation] so that we actually covered all the ramifications of people moving in and kept up that flow of information…Because we were the clients we simply had to get better access to the information and better access to the decision making that was already happening (Interview 1, page 14: branch manager).

On other occasions she had organised daylong seminars for people in the organisation so that they could have ‘a snapshot of where we were up to’ (Interview 1, page 7: branch manager). These seminars were held usually twice a year and in a location off-site. At the time of the interview the manager was expecting to begin planning another of these seminars. It will follow a pattern the manager has used in the past and she will have ‘a whole range of people who are the experts in their fields…and get them to come and brief all these people about this is where we’re at’ (Interview 1, page 8: branch manager). The manager has a sense of the issues to be discussed and then consults with some of her colleagues before finally deciding on the program for the day. In her view this is not ‘rocket science…it is not a hard thing to do’ but she obviously feels it needs to be done to keep information flowing through the organisation (Interview 1, page 4: branch manager).

The groups that information flows through are not always large. One manager has regular meetings with team leaders in the group she manages as a way of enabling the flow of information in the branch that she manages. The manager meets with the group’s five team leaders regularly and her expectation is that they will pass on information to their team members so that information cascades through the branch to its entire eighty or so staff (Interview 6, page 1: branch manager).

Most of the channels mentioned in the interviews involved oral communication but the managers also used information packages to enable the flow of information through formal channels. One manager used email communications to keep his staff informed of the progress and outcomes of an internal inquiry into a conflict of interest matter. This manager also prepared press releases for the media once the matter was resolved (Interview 4, pages 17-18: branch manager). Another manager expects the team leaders in her branch to write and present monthly reports as a 'way of us all sharing information and all of us knowing about it' (Interview 6, page 15: branch manager). Yet another manager foreshadowed a time when significant documents would be posted on the organisation's intranet so that people could have easy access to them (Interview 2, page 9; division manager). This organisation had recently reviewed its internal communications processes and was in the process of replacing its staff newsletter with a weekly newsletter and a quarterly magazine. In addition the branches are developing communication strategies as part of the business planning process (Interview 2, page 16: division manager).

Managers used a mix of both interpersonal interactions and information packages and informal and formal channels as outlined already in some of the examples given. One manager was planning to write a letter to a group of the organisation's clients about the legal status of some agreements and then follow that up with a face-to-face meeting of the representatives of individual clients. The manager explained the reason for the meeting as a way of enabling the flow of information as being two fold: 'to put it all in a letter would be tortuous to write and they would want to hear it face to face' (Interview 13, page 28: branch manager).

Another manager was planning to visit this same group of clients as part of a review of legislation that governs the organisation and its relationship with these clients. The visits and meetings are designed to seek feedback from clients and information to assist the review. The manager is committed to consultation partly because of her experience of witnessing a situation where an agreement was overturned without any consultation with the groups concerned. As the manager commented:

> We won't change the Act without talking to [the parent organisations]…I can see this travelling road show [around the state], but I think at the end of the day we will either have whatever they want to do or we'll change the sections (of the Act) to make it more inclusive of other ways of doing things (Interview 13, page 10: branch manager).

Information flow centres on sharing information with people

Central to the flow of information is the process of sharing information with people. Some times the sharing of information takes the form of the manager informing people about decisions that have been taken or strategies that might be followed with little or no expectation of feedback from those who are informed. At other times, and more frequently among the managers who were interviewed, the sharing of information is more predominantly an exchange of information. This exchange can occur with people within the organisation or it might occur with people and groups external to the organisation. The examples from the interviews that have been cited already in the previous discussion of the directions and channels of information flow refer to, or imply a concern with, the people who are involved in the information sharing process.

A distinction between the two different kinds of information sharing was summarised by a manager when he was talking about the integration of two different work groups each with its own culture and ways of doing things. The integration had taken almost two years to achieve and his frustration with aspects was reflected in his description of it:

> I sometimes would like to revert to my former life [in the Army] where I just say, 'Just get on with it' and there are no arguments, there's no debate. It's purely one-way traffic in terms of the information that you give out and it's going from you to them and you don't expect anyone to talk back…It's a simple transaction and there's no ambiguity…It's particularly true of [organisations like this] with participatory management practices that they can sometimes be so convoluted that you actually do go around in circles…Every excuse you can ever imagine is given for things not to be done (Interview 14, page 21: branch manager).

Another manager hinted at a similar view about the relative ease of one-way transmission of information to the people who report to him, but he was aware of some of the protocols determining the order in which he transmitted information to the people who reported to him. In this example he described the process of informing people at the time of a program change as a:

> …huge strategic operation to tell people at precisely the right time because you can't tell that person until you've told that person and then you tell that person, it's such a flow on effect…(Interview 4, page 5: branch manager).

At the same time this manager did acknowledge his preparedness to hear ideas from the people that he was informing about the changes he had made:

> …how we tell the program [managers] this is what's happening after slightly…after consulting them. The program [managers] know that the decisions rest with me but I like to feel that they're involved and they can put up any sort of difficulties, barriers, whatever…(Interview 4, page 5: branch manager).

The hearing of ideas from others was also raised by another manager in relation to establishing a space or a mechanism for the organisation's volunteer workers to be told about a change to one of the major programs in which they were involved. In the past there had been a problem when a program was changed and:

> …the volunteers actually ambushed it and when they found out about it they sort of made attacking questions and things…so I think the best thing to do is to get them together and construct a very well planned information session and encourage them to voice their doubts to me (Interview 8, page 8: branch manager).

Yet another manager had instituted a space for people to share information on a regular basis. Some years ago she introduced a Monday morning meeting from 9.30am to 10.30am with coffee served:

> It's just a sharing thing that's become a real institution now in which people, the majority of whom don't work to me, meet and actually just for an hour quickly share what's going on in their part of the world…The more people who are involved and understand…I mean it's that whole thing of understanding that I think people like…It's a bit like the deliberate holding of the weekend. People have a chance to examine in depth and ask all the questions they need to ask and can come you know to change their minds (Interview 1, page 4: branch manager).

Several managers reflected on some of the challenges in exchanging information in organisations. One observed that 'communicating in an organisation is a very difficult thing and I think it's very hard to get it right' (Interview 6, page 15: branch manager). Another manager expressed a similar idea but from another perspective when she commented that the exchange of information is 'about us pooling the information. It's not a gossip forum, it's about actually sharing' (Interview 1, page 3: branch manager).

Apart from describing the two different patterns of sharing information, some of the managers who were interviewed pointed to the value of information flow to their organisations. One manager spoke about a common understanding of the organisation's goals in relation to the development of policy and its implementation in the organisation. She recognised the need for information to 'move across the boundaries of the functional areas more effectively' so that 'all the policies fit together' (Interview 12, page 20: division manager). In the implementation of policy this manager suggested that:

> …if people in other parts of the organisation don't understand what [the processes and procedures] mean to them they aren't going to last and [the policy] might just as well sit in my top drawer, go to government and that's the end of it (Interview 12, page 20: division manager).

Another manager confirmed the need for information to move across boundaries when she reflected on the development of the organisation as a single cohesive unit. The integration of the organisation from a number of seemingly independent units had occurred some years ago. Fully supportive of this development and the technological and economic rationale behind, she observed that 'there's a certain silo effect of that [earlier] template' (Interview 1, page 5: branch manager). It was this manager who brought together people and groups in the organisation for the sole purpose of sharing information although she herself is not accountable for the performance of those groups.

The flow of information also encourages better outcomes for the organisation. Managers can check progress against the organisation's goals. The web think tank in one of the examples already cited in the discussion of the direction of information flow was able to review its progress towards the development of the organisation's web site. In the meetings of the think tank, regular reporting back allowed people to see 'what we've delivered on' (Interview 12, page 17: division manager). Managers can also solve problems that might hamper progress as long as the sharing of information is an open process. One manager commented that:

> I find an open exchange of information a much more natural and conducive way of operating…It means that if somebody's got a problem you deal with it, you deal with it directly…You know where it is and what it is (Interview 2, page 18: division manager).

Another manager endorsed the value of information flow to the organisation in developing its programs when she spoke about her role in relation to the people who report to her. The manager is responsible for a state wide network in the organisation and the consultants who report to her are responsible for particular geographic areas or services:

> I see one of the important things of my role is to have the overview. [The consultants] need to know their areas really well and as far as possible I have to understand and have a good feeling for the condition of the whole [state wide] network. I must admit it's not

> uncommon for me to realise that one, a consultant, has missed something because they're working the next level down, whereas I'm the level up and looking at the state as a whole and I will often find myself saying 'oh talk to someone over there, talk to one of the other consultants' because I know that their area is having this problem (Interview 13, pages 2-3: branch manager).

Better outcomes can also be achieved through the flow of information between the organisation and groups external to it. In one example a manager established a group specifically for the purpose of improving the flow of information between the organisation and its volunteers. The manager's objective was to ensure that the organisation used the services of the volunteers as effectively as possible. In her experience she found that:

> …the [group] is obviously considered by the volunteers to be an important vehicle…I've found that it's a wonderful way to bridge the communication gap. It has a practical purpose too. We can solve practical problems. Communication of information from them to me and from the organisation to the volunteer program has been beginning to show benefit…Volunteers hadn't had a voice for fifteen years. What we had for the first few months was they talked and we [the organisation] listened…I would say in the second six months the organisation began to speak to the volunteers (Interview 8, page 15: branch manager).

Contextual factors shape information flow

The managers who experienced information use as enabling the flow of information reflected not only on the process as one of sharing information by either transmitting it or exchanging it with others. They also reflected on the contextual factors that contributed to the success of the process. These factors were related to the information that was exchanged, characteristics of the organisation in relation to information flow and the role of managers in the process of sharing information. In speaking about these factors, some managers attributed the success of the process of information sharing to them directly and other managers reinforced their importance to information flow when noting their absence in the experiences they recounted.

Information related factors

There were two factors identified on the basis of the interviews with the participating managers. One of the factors concerned the quality of information that was transmitted or exchanged and the other concerned the accessibility of information.

<u>Quality of information</u> The information that is transmitted to or exchanged with others in the organisation should add value to the decisions that are made or the activities that engage people. It is crucial for managers to 'have something to impart with value' (Interview 1, page 8: branch manager). The timeliness and relevance of information can enhance its quality for other people.

Timeliness is often a matter of judgement by individual managers in terms of the situations they are managing. When one manager was involved in the relocation of the organisation from several disparate sites to one major location she took the view that information about the relocation:

> …only adds value if you can pass it on straight away. If people are getting it a week, two weeks later and it's dribbling out to them without their chance to see [where they fit in] however sort of difficult they might find that, and people naturally want to ask very specific questions about things like child care and things like that…(Interview 1, page 9: branch manager).

Another manager took a different view about the timeliness of information in her work with a large group of volunteers who have their own networks of contacts or a 'telephone tree'. Sometimes this manager has information about the program she manages but is not in a position to share it. She has though assured the volunteers that ' I will be truthful with you and you will know. But I couldn't say, you will know when I know [about any changes to programs]' (Interview 8, pages 7-8: branch manager).

The timeliness of information is connected to its relevance to others. People need to see the information that is shared as being relevant to them. One manager chooses to share her performance agreement with the managers who report to her. In her view it is the division that she manages whose performance is being measured. Because the staff and their managers are instrumental in setting the direction and programs of the division they need to be able to modify the programs and the measures of their effectiveness as the year unfolds (Interview 11, page 5: division manager). In this way staff have feedback on their performance in the context of the organisation's overall goals as well as affirmation of progress that is made.

The accuracy of information is also an aspect of its quality and can be determined by the credibility of the sources of information. In one particular situation that involved the integration of two work groups one manager observed that '…there's been lots of information filtering going on as the tribes defend their roles (Interview 15, page 18: division manager). In other words, he had doubts about the veracity of some of the information that was being exchanged, at least among the individual members of the two work groups.

Accessibility of information This aspect of information assumes that information is available and raises the possibility of information not being used because its flow through a channel is interrupted in some way. Two sources of interruption were provided, one related to the format of the information and the other to the transmission process itself.
The format of information, according to one manager, needs to signify the importance of information to the people to whom it is transmitted so that appropriate actions can be taken. In this manager's experience:

> …the information may kind of come through in a fairly indigestible fashion. It'll be in a memo or something. You might miss the point of it because you didn't know that it was something that was being discussed by the [executive group] (Interview 3, page 15: division manager).

Even if the information is transmitted in an oral form the need to signify its importance is still necessary. Referring to a situation in which a manager and the division she manages were unaware of an event in which the organisation was a key participant the manager commented that:

> …no one told [the division] and we had no idea this was even a priority…I'm sure the [executive group] had talked about it but it hadn't come down. I don't think it had at all to be honest, but if it did, either [the chief executive officer] didn't put it across strongly enough even to the [executive group] for it to feel it was a priority which I suspect may be the case or somehow people figured we'd know about it and just get on with it and do it and that was not the case (Interview 3, page 15-16: division manager).

This example suggests that the information flow was interrupted possibly because the significance of information was not highlighted in some way or possibly because the transmission process down from the chief executive officer to the executive group and then to this division manager was interrupted in some way. This division manager also experienced another situation in which the division was not made aware of another important event with links to government and funding priorities:

> I didn't even know about the [event] until less than a week before…And that was really important for us to be at and part of it…It was very, very important. It was big deal…A lot of stuff still slips between the cracks because people just don't know about it or the level of significance is not made clear and that is quite often the situation, just the real level of importance (Interview 3, page 16-17: division manager).

The information that this manager needs is not accessible to her either because its importance is not signalled or the transmission of it is interrupted. In this latter case the information is not timely. In her words she needs information sometimes 'right now' (Interview 3, page 16: division manager) if she and her division are to act on it in the interests of the organisation.

Organisation related factors

There are two factors related to organisations that contribute to the effectiveness of information flow. One is the structure of the organisation, closely aligned to the formal channels of information flow, and the other is the culture of the organisation, closely aligned to the organisation's approach to information sharing and exchange.

Structure of the organisation The formal structure of an organisation with its reporting relationships and the location of accountabilities for its programs has a role in information flow. Some of the examples cited already have referred to information flowing across the boundaries of functional groups or the 'silos' in organisations. One manager compared the former more hierarchical structure of the organisation with its current flatter structure and reflected on its impact on information flow:

> So it was very centralised but it was throwing out the information. Then we changed to the [new structure] and I suppose in the setting up of the [new units] everyone was very closely focussed on setting up their own [units] and a bit of a scramble for resources and it began a process in which there wasn't that centralised force any more actually bringing information together and disseminating it (Interview 1, page 18: branch manager).

Another manager observed a similar pattern and drew attention to the necessity to develop substitute channels for information flow:

> One of the things is now the managers actually have to find other ways of talking to each other and informing each other about these things and there's a bit of that kind of coming back into your silo. And I'm as guilty as everybody else because I've been so busy. Other managers are saying to me, look I've heard about this [service level] model, tell me about it and that sort of thing. So it's a very interesting thing when you talk about communicating across an organisation…(Interview 6, page 15: branch manager).

For one manager the flatter structure of the organisation posed problems in terms of information flowing to her in a timely way. The organisation appeared to have found ways for the senior managers to talk to each other and keep themselves informed but those ways were not working well because of the 'silos' of program division and branch managers and support division and branch managers. As the manager described the situation:

> You've got an executive over here that is all the [program] heads and they meet once a week or once a fortnight whatever it is and they talk about things that are going on. Things may happen in there. I have no idea that they've happened because there's no system for that information to come down the track unless someone says shoot. Theoretically [my] position reports to [another executive group]…The problem with all this is that they're all the same people so they kind of go around in circles…We loosely report to that [executive group] but in a practical sense you don't because it doesn't work like that…So where I think we probably miss on the information loop a bit is at the [program heads] level. Things may happen and I have no idea (Interview 3, page 2: division manager).

In this situation the manager and those who report to her are dependent on informal channels and the strength of personal relationships with other managers to capture the information that they need in order to support the organisation’s programs (Interview 3, page 2: division manager).

Another manager experienced a similarly complex structure that also served to inhibit information flow in the organisation. When a large group of about thirty managers was disbanded following the introduction of a flatter structure it was replaced by:

> …kinds of cross organisational committees and so you might be on one, or you might know someone who's on one and the idea was that that was the way people would find out and work together and all that sort of thing. Now in some ways that now itself is falling into a bit of disarray and I think one of the things that's happening is that managers now in some cases are feeling that they're not in the information and planning loop (Interview 6, page 13: branch manager).

<u>Culture of the organisation</u> The culture of the organisation can also contribute to the effectiveness of information flow. Some of the managers referred to openness in their organisations and this is one aspect of organisational culture. Another aspect is the preparedness of people, whether managers or their subordinates, to be informed or to exchange information. There is also an ethical or values dimension in information flow connected to people’s right to know about decisions and actions that have an impact, either personally as in an example given already that concerned the relocation of an

organisation, or professionally, as in an earlier example concerning a manager's ability to meet her responsibilities in an appropriate manner.

Openness in the organisation The approach of the organisation's senior managers to the sharing of information is seen as a sign of the organisation's commitment to the exchange of information. One manager expressed the view that the support of the executive group in her organisation was vital when she was involved in improving a program for which she was responsible. The executive group approved the program and the organisation's chief executive officer and chairperson of the governing body attended its launch (Interview 8, page 15: branch manager). The manager reported that:

> … it's important that the [executive group] is aware of what you're doing and wants it to happen. I would say that facilitates ease of imparting information. You do a paper, you go to [the executive group], they become aware and then it filters down and also all [executive group] papers are distributed to managers and through the staff. So it's how you get your name up and the [executive group] also then decide what goes to [the governing body]…The [executive group] became aware of [the programs that I'm responsible for] and thought this is important and actually started thinking about what they wanted and what we would like to happen in the [organisation] (Interview 8, page 20: branch manager).

This view on the openness of the organisation to information was similar to the views of other managers although some reflected in more detail on the impact of the chief executive officer and the chairperson of the governing body on the approach to information sharing. One organisation was regarded by one of its managers as 'terribly defensive, a terribly threatened organisation, really very, very vulnerable, very uncertain, very lacking in confidence. Not particularly divided internally but very, very defensive' (Interview 2, page 8: division manager).

A colleague in the organisation elaborated the approach of the chief executive officer not by way of criticism but more by elaboration of the approach of the organisation as a whole to information sharing:

> The present [chief executive officer] has been what I would call a pretty secretive sort of person by the nature of his being. He's actually a very shy person so he's found talking to large groups actually something very, very difficult. I think that's sort of permeated the organisation a little. He hasn't got around a lot. He's been in the bunker a bit…That isn't to say that he hasn't had his great strengths, he has certainly and he will be very well remembered in history I think for [some of his technology initiatives]…I think that in terms of leadership as distinct from management that has really affected the flow down of information…It's a certain tone he hasn't been able to set that has permeated the organisation in terms of that openness (Interview 1, pages 16-17: branch manager).

Commenting on the effect of a soon-to-be-announced new chief executive officer of the organisation the manager said:

> I think the nature of that person sets…a great tone and if they are expansive in putting things up and getting feedback and all of that rather than wanting to do one-to-one conversations…I mean the vital need of this organisation as I see it is for a new [chief executive officer] to bring the [divisions] together working as a team for the good of the [organisation] not just the good of the specific [division] over another. It's a very big job…it's a very challenging job (Interview 1, page 19: branch manager).

This rather closed approach to information sharing explains in part the absence of important papers on the Intranet so that people in the organisation could access them and read them. The position is changing though according to one manager who observed that in her experience of one situation:

> …the reason [for papers not being on the Intranet] was partly the [governing body] chairperson's call but just generally it was a defensive organisation that didn't do that sort of thing…My approach [with a change in the organisation's direction] is absolutely to share information around (Interview 2, pages 8-9: division manager).

The approach of work groups to the exchange of information is also indicative of the information culture of the organisation. One manager was responsible with a colleague for the integration of two work groups. The differences between the two groups were stark. One group had embraced collaborative teamwork and exploited communication and information technologies to support its work. The other group had made very few changes to its paper based work practices and had not yet felt the impact of technology as a work tool. The functions and work of the integrated group were premised on collaboration and technology enabled work practices so that different levels of service could be offered to the organisation's clients. The manager summed up the differences as:

> …really two cultures still here…[our group has] gone through this great process. They've sort of emerged from their cocoons and they've gone through those processes, that anxiety you have, I call it the 'where will I sit?'…I think that sort of sense of team is very strong here in [this group]…They're mature teams at this stage whereas [people in the other group] are very anxious about it. They're going through that process now that our staff here went through. So there's a lot of anxiety about skills, the value, the knowledge that I have…that gives me value and status and I think there's some anxiety about that being reduced, disappearing or whatever. But we've had some real milestones. It surprised me that it took as long as it did. Sometimes I can tell you I sat in here and felt like throwing in the towel…It has really been interesting in retrospect but as I say at the time it wasn't (Interview 6, page 5: branch manager).

Challenged by the differences between the two groups the manager attempted to introduce a common information sharing strategy that she had used previously:

> When we moved to teams [in our work group], one of the things I found helpful [for information sharing] was having big bits of butcher's paper up and people had ideas, or had issues, they could write it on the butcher's paper and you didn't have to sign it so it was neutralised the instant it was put up on this sheet. Then we could respond to it. We tried that with this process and we found that didn't work this time. I'm not entirely sure why. (Interview 6, page 5: branch manager).

Other strategies that she tried also met with mixed success. For example 'there was just a lot of talk' at the 'endless meetings' and as a result the group that had been working cooperatively together for some time grew 'disinterested and disbelieving that anything would ever happen' (Interview 6, page 6: branch manager). This manager's supervisor spoke of a 'discordance of information flow' between the two groups and suggested that as the integration of the groups proceeded and people from the two groups began to work side by side there could also occur a 'discordance in the willingness to act upon information that's required to be acted upon' (Interview 15, page 18: division manager). The supervisor was aware of the different strengths and weaknesses of each group as a collaborative work team and the impact not only on information exchange but also on the self confidence and self direction of the people in their respective groups.

One manager who experienced difficulties with the flow of information from the level above her, the executive level, elaborated in terms of the culture of the organisation:

> And there's all this just we didn't know which is a very pervasive thing in the organisation and I think a lot of people feel we didn't know that and we didn't want to tell you, which usually isn't true at all. It's just that we sort of forgot, we didn't think about it or we didn't have an easy way to do that. It would be unusual to draw this person into this meeting so we didn't (Interview 3, page 15: division manager).

It is clear then that information flow is to some extent dependent on people other than the managers themselves, but they see themselves as having a role in enabling information flow.

Preparedness to exchange information Information flow assumes a willingness on the part of all parties, senders and receivers, to actively engage in the process of information exchange. Some of the examples cited already highlight the need for both the transmitters and receivers of information to engage in the process of information flow and other examples raise doubts about the willingness of people to engage openly in the process.

The preparedness of people, both managers and their subordinates, to involve themselves in information flow emerged in a number of situations experienced by managers. It is not only managers who are expected to transmit information. In one situation described by a manager a subordinate did not provide the information requested of him. The information concerned external contracts and was part of the organisation's normal reporting requirements. According to the manager:

> I knew he did external work, I'd asked him on several occasions including in writing…I had asked him to tell me what companies he worked for, what he did with them and he hadn't responded over a period of time… He finally produced a list of the companies he worked for and when I saw it I just went white (Interview 4, page 14: branch manager).

The situation resulted in an internal inquiry into potential conflict of interest issues. The consequence of this interruption to the flow of information was that the manager was not able to make any judgements about the external contracts and the appropriateness of the clients with whom the contracts had been signed. The manager emphasised that:

> The biggest concern was the reputation of [branch and the programs I manage] and that's what I was most upset by…the fact that he hadn't been open with me about what he was doing because in that way me and [a colleague who also reports to the manager] couldn't make a decision about whether there was a conflict of interest. We didn't have the information (Interview 4, page 14: branch manager).

The manager explained the actions of the person in terms of his 'not being frank with me or honest about what he'd done (Interview 4, page 16: branch manager) By contrast the other program managers in the branch regularly report to the manager on their external work and are 'very forthcoming with the information' (Interview 4, page 19: branch manager).

In another situation a manager encountered a similar lack of information but it arose not from a subordinate withholding information but from a sense of there being little purpose to the exchange of information in a large meeting of managers and the executive group. The manager experienced information flow in this instance as:

> …a bit of a frustrating exercise and I suspect particularly for [the chief executive officer] because it literally became a 'talking head'. So it might be her or one of the [executive group] talking and a group of managers of which there ended up being over thirty. It was a very big group who were not generally contributing and there were some changes happening in the organisation and people who had been managers no longer were but they were still on the managers' list and they'd go. People were a bit disaffected (Interview 6, pages 12-13: branch manager).

The meetings of the group came to be regarded as 'just one of the things that you had to go to, part of the ritual' (Interview 6, page 15: branch manager) rather than as an opportunity to exchange information and keep information flowing.

Several managers experienced very positive responses to their efforts to engage others in information flow sometimes to the surprise of the managers themselves. One manager organised a daylong session for the exchange of information on a new direction that the organisation was taking. The session involved a large group of people in an activity that was an unusual one for the organisation. The manager summarised the response of the participants in the session in the following way:

> By the end of the day people were absolutely on a high, they said they'd never had this sort of thing before, never been privy to this sort of information exchange in the organisation, they'd never been made to feel like they had some potential to affect the outcome. It was amazing. It was an amazing reaction (Interview 2, page 11: division manager).

On a similar note it was the experience of another manager that:

> …people are very responsive to having opportunities for development and making judgements for themselves about whether they agree or disagree with something. I don't have a problem about people disagreeing and all that. I have problems about people not letting themselves be informed (Interview 1, page 5: branch manager).

People who are responsible for sharing information need to be willing to do so. Some of the situations already described illustrate the preparedness of managers to exchange information and the willingness of most people in the organisation to participate in the sharing of information. One of the experiences of a manager involved a group external to the organisation and the responsibilities of some of its members for the flow of information between the group and the organisation. The manager required the representatives of the group:

> …to consult as far as ideas are concerned with other volunteers and sometimes volunteers respond to this need quickly and are flexible. An example of that is a couple of weeks ago… one of my volunteers organised a general tour which [didn't] exist…It was seamless and they [the ten volunteers involved] were thrilled with it so they wrote up the whole document…So even though there might be forty tour guides, ten or fifteen directly involved in creating a special type of tour who've had some experience with it will assist me in getting information (Interview 8, page 8: branch manager).

The responsibilities of people within the organisation and external to it imply an ethical dimension to information flow and the exchange of information. This dimension has been suggested in some of the instances cited, especially those in relation to the openness of information exchange and the channels for exchanging information.

Ethical dimension to information flow Information flow is to some extent influenced by the values, beliefs and attitudes of individual managers. While some managers are committed to enabling information flow in the interests of furthering the organisation's progress towards its goals, others are committed on the basis of their personal interests and histories. One manager referred to the 'right to know' and drew on her experience of the relocation of the organisation from several disparate sites to one location. Her concern to pass on information to those immediately affected by decisions taken by the organisation has already been cited. This was the same manager who at times also ran informal information sharing sessions on a weekly basis and organised forums so that people could hear about various projects and priorities in the organisation from those who were responsible for them. Reflecting on her experience of information use the manager commented that:

> I come from the generation that does believe and I still do believe that information is empowerment…I'm a great believer in that whole thing of the more people who are involved and understand…I mean it's that whole thing of understanding which I think people like…(Interview 1, page 3: branch manager).

Another manager felt compelled to address some of the problems that she saw arising from some other managers feeling disenfranchised following a change in the composition of the organisation's executive group. The manager raised the matter with the chief executive officer, feeling at the time:

> … a bit awkward because I mean, it's just my interest that's saying all of this but I know that there are some other managers who are also very keen so in that sense I think, that's fine we can get together and perhaps show the way or start something that others might also choose to be involved in. It's hard to know (Interview 6, page 16: branch manager).

In the event the manager was asked by the chief executive officer to convene a small group of managers and develop a solution to address the problem that she identified. Recalling advice that she had been given in the past about 'fixing the problem, not the symptom' (Interview 6, page 14: branch manager) the manager devised a project as a:

> …useful way of us getting together. The first thing that we are doing is that I convened a group to look at hours of opening across the [organisation] and what it means, loss of revenue from the [organisation's commercial outlet] or savings over time, that sort of thing so it's a small group of us are doing that, so that's a start (Interview 6, page 16: branch manager).

Through this project the manager and her fellow managers will be able to find new ways of talking to each other and crossing the boundaries of their own areas of responsibility and become aware of the range of programs being undertaken in the organisation even though they are now not all members of the executive group.

These examples of managers finding solutions to some of the interruptions to information flow because of their own values and interests suggest that managers are in a position to bring their influence to bear on broader organisational matters when situations warrant their intervention. The culture of the organisation also influences information flow and can either support or impede the transmission and exchange of information through the formal and informal channels.

Role related factors

Managers play an important role in information flow in two respects. Firstly there are indications that enabling information flow is a process that can be actively managed and secondly there are personal characteristics of managers that enable them to manage the process.

<u>Managing information flow</u> Not only does information flow need to be actively managed but so too does information itself. The notion of information flow assumes that

information is both available and accessible. For one manager though this was not the case. As she stated:

> …you just stumble on information in this organisation. There isn't an easy way or a coordinated way to get it and that is partly a simple function of the size and complexity of the organisation (Interview 3, pages 14-15: division manager).

This manager suggested that information flow also needs management or at least coordination so that information can be shared in ways that are meaningful to people. In her experience of information flow surrounding a new direction for the organisation:

> …people had been bombarded with so much information, papers like this [holding thumb and index finger about six centimetres apart]. The file would be this big of just overseas information, of data, of ideas, suggestions, possible ways things could go, horrendous. A huge amount of stuff coming in and people going off over here and doing this and feeding that information back in and something else coming from over here and they may be totally at odds because this group isn't necessarily talking to this group. They're just sort of agreeing, you know blue skying if you like, what could we do with this, or what can we do from that, is it technical, does the technical match the content, a nightmare. In my view an absolute nightmare, total nightmare (Interview 3, page 4: division manager).

Information that flows through channels in the organisation also needs to be used in a coordinated and managed way by those who receive it. This same manager transmitted information to her supervisor and to her subordinates but she noted that:

> … knowledge isn't going anywhere out of here either. We [in the support division] use it but it's not being used by the [program] areas. History is a lovely thing and gee isn't it nice to know what happened but to me it's useless unless it's being applied against the future. We collect it and use it to explain things but we don't have any systems in place for information being used if you like to actually influence the next decision…There's no predictive modelling on any of this which I think is sorely missing…It's like that information never gets to the point of impact…I still feel it doesn't go anywhere. It's not being used (Interview 3, pages 12-13: division manager).

This manager offered no solutions to the impediments that she experienced in information flow. By contrast other managers outlined strategies they had used in enabling information flow for particular purposes in their organisations. One manager carefully crafted a daylong session to share information about a new direction for the organisation and raise people's awareness of it and initiate discussion of its potential implications for the organisation:

> I decided I wanted to have a full day session facilitated by somebody who had some authority where basically we did an update on where everyone was at and we did an analysis, just a straightforward SWOT analysis. We scrambled people into different groups…[and] we were very careful about who we put into what groups…I decided that I actually had to get somebody internally who could hold it together…We put a lot of work into it. I did an information pack about how digital had the potential to transform the organisation which was written in a very easy journalistic sort of style, really sort of straight, light, carried quite a lot of the argument as a sort of talking document, a position paper…The [chief executive officer] agreed to come up and talk and introduce it, to open it and each of the [division managers] was given something to say. We put a lot of effort into structuring it so that we actually had representation both organisationally and by area of interest group giving papers in the morning to try and get the information level to a reasonable state (Interview 2, pages 10-11: division manager).

Another manager was very aware of the need to find an effective way of exchanging information when addressing the organisation's fundraising group:

> I was thinking about what kind of message and what kind of information can I share with people to make them understand how I feel about the [division] as a whole and why I think it is important that [two previously separate divisions] are together and what that means…We had a little show and tell…about what each division is doing to impress our [fundraising group] to go and help raise money and bring their level of awareness up a bit too (Interview 12, pages 18-19: division manager).

Yet another manager who introduced changes to the volunteer program in the organisation was guided by recent history when structuring the exchange of information about the changes. In the past a change to the volunteer program had 'led to quite a lot of trouble' (Interview 8, pages 7-8: branch manager). The manager determined that she would be 'managing the imparting of that information…I think we get them in here together [so they all hear about the change at the one time]' (Interview 8, page 7: branch manager). This approach and its rationale are similar to the situation where a manager made changes to program schedules and encouraged program makers to voice to him any problems, barriers or difficulties that they could see with the proposed changes (Interview 4, page 5: branch manager).

Some of the managers who had planned information sessions in their organisations were keen to structure them so that people, most often their subordinates, could hear from each other and not only from the managers. This was evident in the forums that followed the web think tank where the manager declared to one of her colleagues in the division 'what I'd like to see is the staff present this and that I don't say a word except 'Welcome'. That's exactly what they did and it was brilliant, (Interview 12, page 16: division manager).

The manager who made changes to the organisation's programs for volunteers was also keen to have the volunteers addressing each other at the meetings of the group that consisted of staff of the organisation and representatives of the volunteers. She commented that:

> …the other thing I do at these information sharing sessions is get some of the guides themselves to speak…I usually find that a volunteer speaking to other volunteers is a good way of communicating [organisation] wide concerns in a way that a manager can't do because it appears that I have a vested interest and so it works better (Interview 8, page 9: branch manager).

It is evident from these examples that managing information flow makes demands on managers and their personal characteristics.

<u>Personal characteristics of managers</u> Among the personal characteristics required for managing information flow are credibility with others involved in the transmission and exchange of information, self confidence and an ability to match communication strategies with the needs of the organisation.

One manager specifically mentioned the need for credibility with one of the groups she managed, in this case the organisation's volunteers. The manager is confident that she has come to be well regarded and trusted. She commented that 'you can tell because it's a bit like being a school teacher. You get presents and things all the time, lots of thank-yous' (Interview 8, pages 7-8: branch manager).

Another manager referred to the level of self-confidence and risk taking that is required in managing information flow especially across an organisation. The information session she planned presented certain challenges to the manager. She was warned that it was 'either going to fly or it was going to die and I was going to die with it'. The manager added:

> …now as I say it's not rocket science, not genius stuff by any means but it takes a bit of chutzpah in an organisation like this to actually say: OK I'm just going to take it straight up to you. It takes chutzpah and confidence (Interview 2, page 11: division manager).

This same manager, whose preferred style was to share information in an open way but within the bounds of discretion, privacy and confidentiality readily acknowledged the personal demands that this approach placed on her:

> …being absolutely open and frank and putting everything on the table…in my view [this] is far more effective. You've just got to check yourself all the time that you actually deliver on what you're saying. Of course, if you don't circulate information you don't deliver because nobody knows what you're saying. It's a tougher regime but I think it's more effective (Interview 2, page 17: division manager).

One of the division managers drew attention to the need for managers to be skilled in matching their communication styles with the needs of the organisation. He was reflecting on the environment of the organisation with a fairly stable workforce but still going through what he called 'succession symptoms' following the appointment of the present chief executive officer about four years ago at the time of the interview. Although he was commenting on the nature of the information exchange among a work group as an indicator of its maturity his view adds a dimension to the capabilities that are required of managers in enabling information flow. In his view there was a need in the organisation for:

> …more varied face-to-face communication strategies. It also does change what the nature of the communication needs to be. The more conservative the organisation and it depends on its maturity too and its capacity for self-directed management…as a sort of the opposite you need to be a little bit more directive to those who are not comfortable about decision making and that's one of the tensions that are there…[the previous chief executive officer] was very directive and in some ways one of the legacies was she didn't leave a resilient workforce…resilient in the sense of having sufficient capacity to make decisions at certain levels as you came up through the organisation. [One of the branch managers who reports to me] is an excellent communicator and she has the advantage too I guess in some ways with [her] team because they have the advantage of scale like small is beautiful with only eight people. They're a very able group too and able to argue with each other and walk away and still feel really confident that their work relationships are intact. So I guess that’s another sort of indicator of the maturity of workgroups in the process of information exchange and sharing and being able to have the debate on the day, that the decision be made and move on (Interview 15, page 17: division manager).

Structural dimension

The internal subject-object relation of the information flow conception of information use, as in the information packaging conception, emerged as a relation between people and information. The focal awareness in this conception is on information as an object that has a dynamic dimension in that it flows in different directions and in different channels through an organisation. As an object that is external to people information can be transmitted to others or exchanged with them either as a physical entity or in oral form. The oral transmission or exchange of information is sometimes accompanied by a physical entity or a record of some kind such as meeting notes, briefing papers or other documents, sometimes in hard copy and at other times in electronic form. In the foreground is the transmission of information or the exchange of it with other people. These people might be within the organisation or external to it but they are connected with the organisation in some way. Information and its flow are linked together by people sharing information with each other in the environment they share, that is the organisation. The structure and culture of the environment as well as the capabilities of managers as communicators shape the directions and channels of information flow and to this extent information flow is manageable.

This conception shares the focal awareness on information as an object with the information packaging conception. It differs though in that the process of transmitting or exchanging information is dependent on interactions with others and is not as clearly defined as the three phase process of information packaging. The information flow conception resonates most clearly with the final phase of information packaging, getting the information out, but with a clear focus on the process and strategies for doing so in the interests of the organisation.

Summary

The experience of information use as information flow is summarised in Table 9 that follows.

Table 9

Dimensions of the information flow conception of information use

	Referential dimension	Structural dimension
Information flow conception	Information use is understood as enabling the flow of information by transmitting it to people or exchanging it with them.	What is in the focal awareness is information as an object that flows in different directions and through different channels in an organisation. Information and the directions and channels of information flow are linked together by the structure and culture of the organisation and to a lesser extent by the capabilities of people as communicators.

Illustrative examples

'Personally I find an open exchange of information a much more natural and conducive way of operating and I think it achieves better outcomes'.

'We actually had staff from all over the place who wanted to be there come along and brainstorm what our web site should contain, where it should be and out of that they did sort of mind maps. We put all that together and came up with outcomes which started to inform these strategies'.

Category three: the new knowledge conception

Information use is experienced as developing new knowledge and insights in this conception. This section describes the referential and structural dimensions of the new knowledge conception.

Referential dimension

Three elements of the referential dimension emerged from the analysis of the data drawn from interviews with the participating managers. These elements are:

- new knowledge and insights are constructs
- new knowledge and insights challenge the *status quo*
- there are cognitive and affective aspects of developing new knowledge and insights

Each of these elements is now described using examples and illustrations from the interviews with the participating managers, documents they gave the researcher and notes taken at the time of the interviews. The selected examples and illustrations provide evidence of the meanings attributed by the researcher to this category of description and so they allow others to verify the researcher's interpretation of that evidence.

New knowledge and insights are constructs

This element of the referential dimension has two aspects to it. The first is the nature of the constructs themselves and the second is the information and its sources that contribute to the development of the constructs.

The nature of the constructs

The constructs mentioned by the managers were varied in their scope and detail but they shared some common characteristics. They were intangible although some of them at least in part could be represented symbolically in words or made more concrete through a demonstration along the lines of show and tell. They were new to the managers concerned and sometimes to other people as well and were linked to innovations and initiatives taken by the organisation.

Among the new knowledge and insights that managers developed were:

- a new perspective on the assets of the organisation
- a helicopter view of the organisation's information technology infrastructure and its further development
- an understanding of the legislation governing the organisation and its shortcomings
- a process for digitising archival materials
- a demonstration of datacasting

The conceptual nature of the constructs that were developed is captured in the descriptions given by the managers during the interviews. The manager who developed digitisation processes for archival materials during what he described as 'starting from ground zero on just about the first large scale digitisation project in the world' spoke about starting on the project as a *tabula rasa (*Interview 14, page 9: branch manager). The manager who developed a new perspective on the assets of the organisation referred to the demand that it made for 'a shift in my head' (Interview 10, page 9: division manager). Another manager referred to needing a 'more complete picture' of particular issues before discussing them with the organisation's governing body (Interview 11, page 2: division manager). Having the 'history in my head' of relevant legislation was seen by one manager as assisting her in preparing for a systematic review of that legislation (Interview 13, page 14: branch manager).

Information and its sources that contribute to new knowledge and insights

The sources of information that contributed to the development of new knowledge and insights included published literature and to a greater extent people inside and outside the organisation. In coming to grips with the nature of the organisation's assets one manager read:

> …a lot of sort of information management, knowledge management kind of stuff and there's quite a bit around now about knowledge as being a core asset and how important knowledge and information is of course in organisations and those sorts of successful organisations using their knowledge and information as an asset (Interview 10, page 9: division manager).

This manager also spoke with colleagues in other organisations within the same government portfolio. The discussions were helpful to her to some extent but a lot of those organisations 'chose not to include some of the things that we have particularly the intellectual capital stuff' (Interview 10, page 16: division manager).

Working on a project to digitise a collection of archival materials, another manager was struck by 'the paucity of information' (Interview 14, page 13: branch manager) and he came to rely on a contractor as a source of information. He drew also on his own knowledge and experience of working with information technology (Interview 14, page 13: branch manager). He described his attempts to locate information that he could use:

> There really wasn't a great literature to even draw on. Things were just starting to be written but there wasn't anything much going on and I managed to track down a Wittgenstein archive in Norway who were thinking of doing something similar…and I was in [email] correspondence with them for a few months but they never really gave me anything useful. So essentially my almost personal knowledge, talking to the contractor that we worked with really was the basis for what we did (Interview 14, page 13: branch manager).

The manager likened his use of the email system and listservs to 'a cry for help in the wilderness' and described his own collecting of information on digitisation as 'entirely sort of iterative' over the seven year period of his involvement with it at the time of the interview (Interview 14, page 5: branch manager).

Yet another manager, who had assumed responsibility for an additional branch that was amalgamated with the division that she manages, developed an understanding of the work of the branch by speaking with its managers and team leaders in a series of one-on-one meetings. This approach enabled her to 'learn a heck of a lot about what they do which I needed to do in a hurry' (Interview 12, page 23: division manager). One of her colleagues found it very helpful to speak with others about the legislation due for review. In this particular instance the manager expressed a preference for people over documentation as sources of information:

> …while you have files and while there'll be bits and pieces of information it's often when you can sit down with someone and say OK, how did this happen or why are we here where we are [that it becomes clear] (Interview 13, page 14: branch manager).

A manager who was fairly new to the position of division manager although she had been previously a branch manager in the same organisation relied on her colleagues in developing her understanding of issues in the division. She acknowledges:

> …a greater reliance on other people giving me basic information that I need to know and relying on their ability to decide what I need to know and what I don't need to know… and then just deciding where you need some more filled in stuff and where you don't…When I say filling in what I mean is more background to give me a complete picture…While on one level it's OK on another level I need more… being well prepared

> and understanding what's going on…It's not enough to just read the paper [for meetings of the governing body] without thinking about the implications and if I see implications then going back and saying well if this happens what are you doing about it, have you thought of, you know (Interview 11, pages 1-2: division manager).

One manager expressed concern about the quality of the information and information sources that she and others were expected to use in understanding the impact of digitisation on the organisation. This manager regretted that the organisation had not called on people with relevant expertise to assist in assessing the options that seemed to be available, commenting that is 'conceptually quite difficult' for people in the organisation to think about the impact of digitisation on the organisation's programs (Interview 3, page 7: division manager). She spoke of the 'learning curve for people to even understand what digital is and what's possible' (Interview 3, page 8: division manager).

Among her concerns with the accuracy of information were some technical issues about the transmission of data and signals as well as uncertainties about any legal or moral obligations on the organisation to reproduce digital material in analogue mode. The manager reported that:

> …there hasn't necessarily been very clear and accurate information. There's been a lot of 'could be this, might be this, might even be this'. All three of those things get discussed, which one is right? They're not all right, one of them's right (Interview 3, page 8: division manager).

Another concern for this manager was because the purpose of gathering information about digitisation was unclear people had difficulty clarifying their ideas and understanding. She suggested that there was a need for 'the parameters that people are working in' to be clear so that 'if you've been sent off to look at whatever the topic area is, at least be clear that this is fundamentally what we're intending to do and these are fundamental pieces of information that you actually need to be able to do what we've asked you to do properly' (Interview 3, page 9: division manager).

The novelty of the projects and programs in which the managers were engaged suggests that there would be relatively few published sources of information available and that few people would have the expertise required for the innovations on which the organisations had embarked.

New knowledge and insights challenge the status quo

Because the managers were moving into territory unknown to them and in some instances unknown to others their projects and programs sometimes challenged current work practices in their organisations and at other times the orthodoxies of professional practice as well. Implied in these challenges to the *status quo* are a forward looking orientation and a change in the significance of information as new knowledge and insights develop.

One of the managers related her experience of leading technology developments in the organisation. These developments challenged some of the work practices in her organisation as well as industry and professional standards. She coordinated the development of a datacasting demonstration that drew on her own learning and insights as well as those of her colleagues. The demonstration represented a departure from established professional practice and exploited the capacities of the communication and information technologies as broadcasting media. In some ways the manager saw the demonstration as a surrogate or representation of her new knowledge and insights:

> …when we got the datacasting demonstration that was the breakthrough because suddenly we could see how it was going to look and feel different, how we could leverage content for the organisation, how this was going to be fundamentally different to traditional [broadcasting]…[we] came away thinking we can actually play this game now...We've got something so inspiring in its content it made sense of everything else we'd been doing. It was just terrific. So we showed it to the [governing body] and they applauded it. That was a real catalyst for us in many ways. It sort of made sense of everything…we'd been working up [funding] submissions all of which is a bit arcane until you can actually see something on the screen and so it meant we had something to show government, to show the industry. We had something to show the staff. It was really a device to actually say we're there (Interview 2, pages 13-14: division manager).

The new knowledge and insight of another manager also presented similar challenges. As the digitisation project unfolded in his organisation it became clear that the flexibility offered by the technology suggested a reconceptualisation of one of the tenets of traditional archives and records practice: the series as the fundamental indexing unit. The project also challenged the status attributed to a particular archival collection as an exemplar by exposing inconsistencies in its provenance, contents and organisation. The manager described these challenges to professional practice as:

> …a quantum leap in philosophy…The archives view of the world is really the series and what you are looking at in terms of a group of records but here we were deconstructing their systems and actually going down to single sheets of manuscript and providing access to holograph letters within series. We maintain the series system but the search engine allows searching across series simultaneously so you can do things like show me all the letters that [an explorer of the coastline of Australia] wrote in French and you can get them all going across series (Interview 14, page 9: branch manager).

Forward looking orientation

The forward looking orientation of the managers who experienced information use as developing new knowledge and insights is linked to the goals of their organisations and the 'big picture' of which it is part. One manager outlined the complexity of the organisation where she has responsibilities for information technology and the collection of materials on which its programs are based:

> This is a very complex although small organisation. It has a whole lot of pieces. [Its information technology infrastructure] had never really been brought together at this sort of strategy level before (Interview 12, page 15: division manager).

The bringing together of the infrastructure at a strategic level involved the manager in adopting an inclusive perspective and considering information technology in the context of service delivery to clients as well as underpinning the organisation's own operations. Such a perspective had not been brought to the organisation's technology base previously. Another manager developing a new understanding of the assets of the organisation also brought an orientation to the future to the use of the organisation's assets by its clients:

> I guess the interesting thing about this for me too was identifying what the assets are and then perceiving our service delivery in terms of the use of an asset rather than just being, well, here it is and the clients come in and use stuff and take things away…it's also about how effectively we use the assets, how well the assets meet the client's needs, what the assets need to do to adapt to future client needs, and bringing all those sorts of asset concepts together, so the building, the access, how well the air conditioning works, how well the lights work, how effective the furniture is before the people actually get to the [indexes] to use the collections, to then make copies of things and go away (Interview 10, pages 8-9: division manager).

Reflecting on the need for a strategic approach to the needs of clients led one manager to express some concern about becoming overly involved in detail. She commented that:

> I think often some people are too detailed and as a manager I see that in the technical areas. Some managers find it really hard to pull out of wanting to talk in detail about how to do spray painting or something and don't get to the strategy of how technical services should be working to link the needs of the clients…I'm not someone who has to dig down deep on every issue. There are some issues where you've got to know where you have to but some people can only dig down and that prevents them from being strategic (Interview 1, page 16: branch manager).

This same manager recounted an instance where she had been required to engage with detail in order to develop her knowledge about a building and insight into space requirements for a work group. She examined the building plans until she 'knew every aspect of the [new] building' (Interview 1, page 14: branch manager). This detailed knowledge of the building later became the basis of significant alterations to the plan when it was realised as a result of her insight that a 'mega mistake' had been made (Interview 1, page 15: branch manager). The manager explained the need for the building alteration in terms of a gap in translating the functional relationships of work groups into a blueprint and paper plan. She counselled that 'you've got to put that work in really' (Interview 1, page 14: branch manager), not only in the interests of 'just having to learn', but also so that the ideas behind documents such as plans and blue prints can be represented to people in the organisation (Interview 1, page 14-15: branch manager).

Some of the managers reflected on their experiences of needing to develop new knowledge and insights but without a forward looking orientation taken by the organisation and in the absence of a longer term planning framework. In one organisation an earlier attempt to introduce quality improvement had failed but the organisation had learned from the experience and was moving to differentiated service levels as a framework for improving quality. A manager suggested that:

> I think as an organisation we've learned from this [past attempt] because it hasn't been entirely positive…I think it was done with the best of intentions but I think we hadn't as an organisation really planned it well. We hadn't thought well, what is it that we want. We started off talking about efficiencies and then there was this great cry from staff that positions would be shed. We had to take another tack [because] it was flawed...Underneath it all there was this belief that it was worth doing, that we really had to have a coordinated approach to providing services to our clients and things (Interview 6, pages 8-9: branch manager).

The organisation has now decided what it wants since that first attempt and there is now an explicit framework for addressing such issues as staffing levels as the changes are introduced. In other words there is an orientation to the future and to what is to be achieved. This orientation provides a framework within which managers and others can develop new knowledge and insights of their own.

Another manager also drew attention to the lack of a forward looking orientation in the organisation apart from a looming deadline set by government. Because of a lack of a planning framework and a clear idea of its directions the manager feels it is not possible to develop a clear understanding of the meaning of digitisation and its impact on the organisation and its programs. For this manager 'it's a bit like…the notion is that the information will drive us to a decision rather than us choosing what it should be (Interview 3, page 6: division manager).

In a similar vein this manager commented that her division, a support division is not 'actually moving the [organisation] forward' (Interview 3, page 17: division manager). She recognises that her division and its staff are unable to adopt a strategic approach independently of the program divisions. She expressed her frustration with this state of affairs in the following way:

> It's totally not strategic but they [the division's staff] can't be strategic independently. They can't and that's my fundamental problem. I can't get that information. People won't commit to it and that's the hardest part. They will not commit to those bits of information that we need. We can't get it. They won't commit to it (Interview 3, page 17: division manager).

Changing significance of information

Apart from a forward looking orientation the process of developing new knowledge and insights suggests that the significance of information to people changes over time. As an organisation or an individual moves forward developing new constructs information takes on a different importance so that information once seemingly inappropriate, unsuitable or irrelevant has fresh impact and might now be regarded as appropriate, suitable or relevant. In a sense the time for the information has come.

In an example already given one of the managers referred to the division she manages as not 'moving the organisation forward' (Interview 3, page 17: division manager) because there was no framework for making decisions about the organisation's directions. In a similar way another manager described herself and the organisation moving forward when reviewing the legislation that governs the organisation: '…in my thinking as we move through this review in the forefront of my mind will be: What will the implications…be for the [organisation]' (Interview 13, page 12: branch manager).

It is this sense of forward movement that is related to information taking on a different significance. One manager offered some comments on her experience following her promotion to the position of division manager. She described the handover from the previous division manager who had been her supervisor commenting that it was:

> …a real effort of sort of, oh you need to know this, and you need to know this, and you need to know that, and that was this real big learning sort of thing where I knew that she knew those things but I didn't have to know them in great detail [when I was a branch manager]. I just helped her with stuff. I fed her some of that and now I was sort of getting it back three-fold… stuff like cost of government…and forward estimates committees reports and all that sort of administrative stuff …and policies and procedures that were affecting you at the level you were at but have a different ramification when you've moved on…I now need to take on [a lot of things] in a more serious way than I did when I wasn't directly connected to that sort of information (Interview 11, page 4: division manager).

Later in the interview the manager spoke about reusing information, again highlighting the possibility of change in the meaning and significance of information:

> The way that you use information is that you might have it for something else and it's that ability to reapply it back because the situation's changed and just think, I knew that before and that was what I tried to do and it didn't work but now I can use it again because this time it will work. That sort of fit that you want, that either happens or it doesn't for you I suppose…You really need a fairly clear idea of what it is you're wanting to achieve, because if you haven't got that you could be in a big mess. True! (Interview 11, page 20: division manager).

Another manager also reflected on the possibility of finding that 'fit' between oneself and information. Referring to the integration of two work groups she commented that:

> I have huge files and I'm not sure what I'm going to do with it all because I think in some ways it's a very interesting history of a process…Funnily enough when I was looking at some stuff just to refresh myself for talking with you today, some of the stuff we were talking about at the beginning is absolutely right for now and some was way off beam. That's been another interesting thing. You realise you keep finding things (Interview 6, pages 19-20: branch manager).

These reflections on the forward looking orientation and the changing significance of information suggest that the process of developing new knowledge and insights might be seen more as a journey of pauses, stops and starts rather than as an almost linear process with clearly delineated phases. With information taking on the character of 'stuff' whose time has come there can be no defined beginning or end points of the process and least of all of any phases within it. It is as though information has the quality of some material that is yet to be worked on or formed in the making of something else.

Cognitive and affective aspects of developing new knowledge and insights

The evidence in the examples and illustrations presented already suggests that there are cognitive and affective components involved in developing new knowledge and insights. Where physical, observable action was mentioned it was in the context of being able to stand back from a situation to gain space and time for new understandings and insights to emerge. For example, one manager described herself as 'one of those people who has to go away and mull for a while' (Interview 6, page 8: branch manager) and another spoke about some of her colleagues finding it hard to 'pull out of wanting to talk in detail' (Interview 1, page 16: branch manager).

Cognitive aspects

The descriptions of the process as experienced by the managers featured an emphasis on cognitive behaviours associated with analysis and reflection, thinking and learning. Reinforcing the cognition involved in the process, one manager described it as being in part 'intuitive…some of it's just keeping it all in your head' (Interview 11, page 20: division manager). The manager who developed an understanding of the digitisation of archival records, from its technical aspects through to its flexibility and its impact on the organisation and its goals, described the process in terms of learning:

> We were just learning as we went and experimenting really with file types and working out which was the best in terms of accessibility and visibility so that you weren't putting files over there that were so huge you were getting fantastic resolution but they were taking ten minutes to download. Also we had to build a search engine to actually search the site which in that time was quite new although now it's becoming quite common (Interview 14, page 9: branch manager).

Cognitive behaviours are also evident in adopting a forward looking orientation and engaging in strategic thinking. These behaviours are also evident as the managers make sense of their situations in order to learn from them.

Affective aspects

The affective aspects in information use experienced as developing new knowledge and insights stem from the risks that managers take in moving into the unknown as well as a sense of achievement. Some of the emotions experienced were also slightly negative as managers struggled with the shortcomings in their current states of knowledge or were concerned that they had developed new knowledge ahead of their colleagues.

The manager involved in the digitisation project described it as 'very dangerous and risky' and one that 'only worked by the skin of my teeth'. Not only was there no information to guide the manager but there were also financial constraints so that 'it was a very seat of the pants operation' (Interview 14, pages 5-6: branch manager). Looking back on the project the manager's relief about some of the decisions that were made on the basis of his insights is almost palpable:

> Towards the end some of our assumptions were ratified by subsequent events in a sort of external world. For example, our decision to use jpeg files was endorsed by the fact that jpeg became the sort of standard for moving information around. At that time there were a number of choices that we could have gone with. Thank God we chose the right kind because you're looking at sort of proprietary standards or proprietary systems or file types (Interview 14, page 9: branch manager).

Another manager attributed doubts, concern and almost fear to others when she was engaged in learning about digitisation and its implications for her organisation. Although this particular manager found the process in this instance lacking any strategic direction, her experience highlights the risks taken by managers involved in innovation in their organisations:

Some of the managers experienced feelings of elation once their new knowledge and insights had been developed. The manager who was able to develop a helicopter view of the organisation's information technologies and share it with others in developing a strategic plan for the organisation's communication and information technologies described the experience as 'mind blowing' (Interview 12, page 10: division manager). This manager also took what she had learned from this experience about the organisation and its complex structure and applied it in a different situation when she assumed responsibility for an additional division of the organisation. She extended her insights and learning to the enlarged division and developed a policy framework as 'the way to take us forward' (Interview 12, page 24: division manager).

Mixed feelings about the development of new knowledge and insights were shared by a number of managers. The manager who described the experience as 'mind blowing' also acknowledged that she found it frustrating as well as challenging and rewarding (Interview 12, page 15: division manager). Another manager spoke of her new understanding of legislation with some grudging fondness and pride:

> I'm probably gaining more than anyone because my understanding of the Act is better than it's ever been in all its horror. Therefore, as we go through whatever it becomes I should have this continuity… coming in and picking up an Act that was passed in '39 that had various bits and pieces changed and being new to the job, it took me quite a while to get any sense of ownership. Whereas now I feel it's not my best friend, but my bed companion…The Act's actually so complicated, it really took me three or four years to truly understand all its nuances (Interview 13, pages 13-14: branch manager).

Yet another manager was aware that her thinking was at odds with the thinking of others in the organisation. Echoing an earlier observation that the development of new knowledge and insights involves a forward looking orientation this manager couched her reflections in terms of moving on as she developed her understanding of differentiated service levels and their impact on the organisation:

> I know that I have moved on but I think sometimes other people haven't moved on as well and I've made an assumption that they have. I wish I had done a little bit more [talking with other managers] and not perhaps making assumptions about people being there with me and that they've moved on with me (Interview 6, page 20: branch manager).

For some managers the experience can cause tensions arising from time pressures and the disjunction between the current state of knowledge and the emerging knowledge and insights. The need for managers to have the time and space to make the conceptual shifts in their thinking was reinforced by one manager who reflected that the experience 'was very stressful at first because, it was sort of 'just go and write that' and everything else just kept going. That's a time management issue of course (Interview 10, page 11: division manager).

This manager also experienced some tension between the ideas she was reading about and developing in her own thinking and the understanding held by government on the nature of the organisation's assets. The differences between the different sets of understandings are made clear in the manager's description of them:

> Well, in [the government's] documentation they talk about assets being all the assets of an organisation which from our perspective, of course gets down to people as well as our core assets which are our collection, our IT and we've also included the intellectual capital of the organisation in developing our databases and our catalogues, indexes and all of those kinds of things…The guidelines that [we're using] are draft. They've emanated primarily from [a government department] that's focussing on plant, equipment and buildings (Interview 10, page 7: division manager).

The manager was trying still to resolve the tension between these two different views at the time of the interview. She also draws attention to the nature of new knowledge and insights as a construct:

> …the really interesting thing about this is that some of the literature that I read … Reading that stuff on the one hand but then being told on the other hand that no, no, assets are just buildings and plant and equipment is one of those sorts of tensions I guess that I'm trying to sort out in my own mind (Interview 10, page 9: division manager).

The organisation and its governing body are supportive of the broader approach taken by the manager but she appeared rather despondent at the time of the interview about the government's willingness to reconsider its approach. The manager's developing knowledge is challenging the views of government and she suggests that government thinking needs to move:

> I've got information management literature that's talking about knowledge management and knowledge as a core asset and all that kind of thing. I think that's really where we [the organisation] are rather than it just being about bricks and mortar. How we get to move those views along I don't know. All that knowledge and intellectual capital stuff aside the most important one for us is of course the collection and if you can't have that recognised in an asset management plan then there's a big problem there that needs to be acknowledged. There's a long, long way to go and the way we're thinking is obviously not quite where the thinking is about these sorts of things (Interview 10, pages 9-10: division manager).

Structural dimension

The internal subject-object relation of the new knowledge and insights conception of information use emerged again as a relation between people and information. The focal awareness in this conception is on information as internal to the individual and therefore subjective in the sense that its existence depends on a person knowing something. The meaning of information changes as people develop new understandings from information, from their analysis of it and their reflections on it. The process of developing new knowledge and insights is internal to people and suggests an intimate relationship or connection between information and people. The process cannot be observed although its starting point becomes clear to the knower. If the new knowledge and insights are recorded in some way then the record becomes a surrogate that marks the completion of the process. There are both cognitive and affective elements to the process of developing new knowledge and insights and it is a process anchored very much in the present. Information and new knowledge and insights are linked together through a person's recognition that his or her current state of knowledge is inadequate for a project or program that is unfolding in the organisation and through the changing significance and meaning attributed to information.

This conception is qualitatively different to the information packaging and information flow conceptions with their focal awareness on information as an object and the linking of people and information in observable processes of information packaging and transmitting or exchanging information. In the new knowledge and insights conception the changing meaning and significance of information occurs in the context of the enactment of a managerial role. In the conceptions that emerge from the focal awareness on information as an object it is the information that is packaged and transmitted through the organisation. In the conception that emerges from the focal awareness on information as a subjective construct, it is the person who moves forward in the development of new knowledge and insights.

Summary

The experience of information use as developing new knowledge and insights is summarised in Table 10 that follows.

Table 10

Dimensions of the new knowledge and insights conception of information use

<table>
<tr><th></th><th>Referential dimension</th><th>Structural dimension</th></tr>
<tr><td>Developing new knowledge and insights conception</td><td>Information use is understood as developing new knowledge and insights through a process that has a forward looking orientation and both cognitive and affective elements to it.</td><td>What is in the focal awareness is information that is internal to people. There is a disjunction between the current state of knowledge and the knowledge required for a project or program that is unfolding. Information and new knowledge and insights are linked through the changing significance and meaning attributed to information.</td></tr>
<tr><td colspan="3">Illustrative examples
‘I know that I have moved on but I think sometimes other people haven’t moved on as well and I’ve made an assumption that they have’.

‘The way you use information is that you might have it for something else and it’s that ability to reapply it back because the situation’s changed and just think: I knew that before and that was what I tried to do and it didn’t work but now I can use it again because this time it will work’.</td></tr>
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Category four: the shaping judgements conception

In this conception information use is experienced as the making of judgements and decisions. In this section of the thesis the referential and structural dimensions of the conception are described.

Referential dimension

Four elements constituted the referential dimension of the conception of information use as the making of judgements and decisions. These elements are:

- judgements and decisions are shaped by information, principles and values
- judgements and decisions take time to emerge
- others need to be informed of the judgements and decisions that emerge
- the shaping of judgements and decisions can be distorted

These elements are described and illustrated with examples from the interviews with the participating managers. The descriptions and illustrations provide the evidence for the researcher's interpretations of the managers' reflections and revelations on their experiences of information use. These experiences are qualitatively different to those that led to the researcher's delineation of the conceptions previously described.

Judgements and decisions are shaped by information, principles and values

The principles and values that shape judgements and decisions are very often derived from the organisation rather than from individual managers although this should not to be taken to mean that there is necessarily an alignment of organisational and personal values. This source of principles and values reflects on the commitment of some managers to their organisations and the way they view their role in bringing what they see as benefit to the organisations.

Some of the managers clearly articulated their approaches to the shaping of judgements and decisions. The situation outlined by one manager concerned the future of a long term relationship with a partner organisation with dissolution of the partnership being one of the possibilities under consideration. The manager spoke about his experience of information use in this situation and suggested that the judgements and decisions involve more than a simple decision to take action of some kind:

> At the end of the day you can gather so much information but the decision maker or I fall back onto either a set of principles or beliefs and the information I gather informs what are those frameworks. It's then about making a decision that asserts what are the principles that are most important that I believe are in the best interests of the longevity of this institution and the people who work here and those who are nourished by the services that they take from this institution. That's things like principles and values, other consequences and being washed and brushed with information over time and not necessarily a discrete activity which is researched for this topic for now. This topic has a lot of legacy information that shapes and informs [our decisions] (Interview 15, page 8: division manager).

The same manager again referred to the importance of principles and values in shaping judgements and decisions when he spoke of another situation that involved a delegation meeting with government ministers to argue a case on behalf of the organisation:

> [People] come to [our organisation] because they believe they can trust the people and [the organisation] is the symbol of some very fundamental values that surround in our style of community notions like 'my right to know and I know I will get unbiased, unvetted support and information'. Those sorts of values need to be transmitted into the agency we're working in…We didn't argue about money. What we argued about was the right to know…We had the experience and we had the know-how but that's the asserting of the beliefs. There wasn't much paper surrounding it (Interview 15, pages 9-10: division manager).

Another manager expressed a similar understanding of information use as he reflected generally on the planning process in the organisation. He stated that:

> We inform our decision making by going through those principles that guarantee our success and the principles are: we move in partnership with the business. We consult broadly which is different from the partnership with the business. Consulting is just

> talking, asking, getting feedback. Partnership with the business means involving [people] in the teams, involving them in the work, getting by, running with their ideas rather than [my work group's] ideas. Satisfying their needs rather than going for the quick win (Interview 7, page 12: branch manager).

The manager was very aware of the needs of his organisation and his role in ensuring the primacy of its longer term interests over the shorter term needs of his work group. Yet another manager drew attention to the longer term benefit of the organisation when she suggested that:

> …the [review of] agreements has provided us with a whole range of information that is leading us fairly strongly to making a change which hopefully will be for the better (Interview 13, page 13: branch manager).

This manager was involved in the review of legislation governing the organisation. At this stage of the review it seemed that administrative regulations that took their direction from the relevant Act of Parliament would give the organisation more flexibility in making changes of an operational nature and avoid the lengthy and costly process of resorting to changes to the legislation. This emerging solution promised to benefit the organisation while at the same time enabling it to meet its legislated mandate.

One manager who understood information use as the shaping of judgements and decisions recounted details of two sets of principles operating in the organisation and his response to the situation. One set of principles related to the organisation's role as a publicly funded institution in the cultural industries sector and the other to the organisation's imperative to generate income in a climate of reduced public funding. The manager's belief that the organisation would be 'remiss in our duty to the wider Australian community by making people pay for [heritage material]…intrinsic to the foundation documents of Australia' (Interview 14, page 6: branch manager) shaped the judgements and decision that he made in a digitisation project:

> Originally it was thought that it would be put out as a product which people would pay for but all of that got really forgotten. Because no one really supervised me it was quite easy to be radical in some of the decisions that I made…I just made an executive decision one day and forgot about the CD-ROM and just went directly to the Internet and I actually didn't tell anybody because at that time people just didn't know what I was doing and it didn't matter to some extent that I didn't tell anybody really (Interview 14, page 6: branch manager).

The difference between the two sets of principles was resolved not by any action on the part of the manager or the organisation but more as a result of the passage of time and the success of the project.

The place of principles and values as well as information in the shaping of judgements and decisions suggests that this shaping is in part an intuitive process. One manager, describing his own decision making as 'very intuitive' (Interview 4, page 9: branch manager) referred to the 'honing, honing, honing what we should do' in changing one of the organisation's programs that is his responsibility (Interview 4, page 3: branch manager). He elaborated his approach to the shaping of judgements and decisions:

> I don't make emotional decisions…but I look at all the facts. A large part of what I do is gut feeling…I think in any job like this, but in this job in particular I've always been guided by gut feeling based on a huge amount of information that I get from the [clients] and how they react to things…You bring all that information together, you listen to audience research, you go to focus group research, all that sort of stuff (Interview 4, page 9: branch manager).

This last comment resonates with the kind of refinement and polishing that another manager suggested takes place when he spoke about principles and values being 'washed and brushed with information' (Interview 15, page 8: division manager).

Judgements and decisions take time to emerge

There are two aspects to the time taken for judgements and decisions to emerge. The first aspect relates to the verification of information that is used by managers, particularly as different sources of information are used. The second relates to the confirmation of the appropriateness of the judgements and decisions. Managers often rely on conversations with people as a way of confirming the suitability of their emerging judgements and decisions. These two aspects are not seen as distinct phases of a process but rather as interdependent aspects of the unfolding of judgements and decisions. Sometimes information, contextualised by principles and values, precedes the judgement and decisions. At other times, information, again contextaulised by principles and values, proceeds the judgements and decisions.

One manager drew the following analogy in his description of the experience of information use in making changes to a major public program offered by the organisation:

> It's like this is the path I'm going down, are you comfortable with this, because I don't want to get to the end of the path having talked to all sorts of people about this, that and the other…I don't want to get to this end of the path and you say "no, you've done it completely wrong I'm not happy with that". I want to get to the end of the path where [my supervisor] would say, yes, that's right and then [the managing director] would say, that's right, that's fine, you've done the right thing. What I do… I kept going back and going back…I kept going back to them saying, so this is what we're going to do, OK? I kept going back to the sources of the information saying, am I on the right track, is this what you're thinking? (Interview 4, page 21: branch manager).

Verification of information

Managers used several different sources of information to shape their judgements and decisions. One manager engaged in 'some orthodox research', reading journal articles and books selected from a literature search (Interview 15, page 23: division manager). The manager also spoke with people that he trusted. At another point in the interview the manager noted that although he had done some reading:

> …there's not been much around to inform me about what are the appropriate practices in these sorts of instances. It's been a case of having to find somebody's who's approximated some similar sort of experience and it's a case of 'How did you cope? What worked for you? What won't work?' (Interview 15, pages 21-22; division manager).

Another manager relied on client research when making a judgement and decision but instead of relying only on the documented reports of the research, he also attended focus group sessions and found them very valuable in terms of the information they provided:

> I went to every session. There was something like twelve sessions in Sydney and Melbourne. I went to all of them. I could have just got the research but I didn't want it filtered by the [company] even though I had a lot of respect for the person who was running the research. I wanted the nuance…and that's been really helpful for me because it was the biggest connection with the audience I've ever seen. We do lots of public forums and public events and I see the [clients] there and meet the [clients] there, but that was really concentrated you know (Interview 4, pages 9-10: branch manager).

Some managers used information generated by the organisation. In one instance the information was provided in the form of monthly financial reports. This information supplemented the manager's 'pretty good knowledge of what's being required of the resources that you've got at the time' (Interview 11, page 8: division manager). In another instance information was generated within a manager's branch through 'a time measurement study…really just about what staff did…so that we had an idea about how time was spent' (Interview 6, page 11: branch manager). The numeric data gathered through the study was then used in discussions with others to reach decisions about the opening hours of some of the organisation's facilities and services.

Confirmation of the appropriateness of judgements and decisions

This aspect of the shaping of judgements and decisions also takes time. Managers are committed to the effectiveness or success of the judgements and decisions that emerge. Ideas as well as information are verified. In the words of one manager:

> …good management is planning well and then doing it well and how do you know if you're planning well? Well, we get information and if we get information that contradicts our ideas we won't let them out the door… If you ask me how do you make sure that you're doing the right thing and that what you're doing is successful, well we test everything, we verify it before we go ahead with it…We make sure it's right before we do it to guarantee our success…I guess we're not just getting an idea and running with it, by the time we go anywhere with it we know it's going to work because we've run it through that rigorous sort of process (Interview 7, pages 12-13: branch manager).

A number of managers who relied on others in the shaping of judgements and decisions engaged in many conversations within their organisations and some acknowledged the importance of personal relationships in their judgements and decisions:

> I never make decisions, big decisions by myself. I always talk to people. I always talk to program makers who I think are influential and who have good ideas. I talked to editors, I talked to [my supervisor] I talked to audience research people (Interview 4, page 5: branch manager).

This same manager noted that 'it's a shame to say it but it gets to personal relationships in a way in these sorts of things' (Interview 4, page 4: branch manager). He showed his sensitivity to the needs of his workplace colleagues several times during the interview. For example, he spends considerable time walking 'up and down the corridors talking to people all the time' (Interview 4, page 10: branch manager) and he plays an active 'hands-on' role in the development of some of the organisation's programs. He finds this last activity 'really grounding and…a great way to keep in touch with how people work' (Interview 4, pages 11-12: branch manager).

In speaking of the conversations he has as part of the decision making process the manager commented that he was more reliant on oral information than on written information sources. He said:

> I do lots of talking about this is the way we're going to do it. So I don't rely very much on written material. I rely a lot on talking and then I have to develop a paper or whatever for the [governing body] or whoever. It's not that I don't like writing. I love writing and that's what I was trained in but we get lots of documents [here] that I barely read. Even though I should read them there are huge numbers of papers that come across my desk (Interview 4, page 22: branch manager).

Another manager also referred to the conversations that took place in his organisation but his view was more critical of formal meetings in decision making. He estimated that fewer than one per cent of the meetings that were held resulted in any significant change to what the organisation does. He suggested that:

> We need to perhaps distil what we're meeting about and change the nature and the tenor of the conversations that occur when the parties come together. I actually attribute that partly to the culture of this place and in general the culture of [these kinds of institutions]. [These] are fairly democratic institutions and there certainly is an expectation in this place that everyone will be informed on every thing (Interview 15, page 16: division manager).

Others need to be informed of the judgements and decisions that emerge

An important consideration in the shaping of judgements and decisions is the question of who will be informed about the judgements and decisions. One manager referred to what he called the 'corona of decision making' as including both the judgements and decisions about those who must be informed (Interview 15, page 16: division manager). Among those who must be informed are those 'whose working lives are going to be affected by this decision (Interview 15, page 16: division manager). The corona is also partly a matter of people's expectations and the culture, or ways of doing things, in the organisation, as the previous illustration from one of the interviews makes clear.

Associated with the question of who needs to be informed about judgements and decisions is the matter of the point at which others are to be informed. In one situation outlined by a manager a decision was made not to inform others about a decision making process that was in place in the organisation. The manager was part of a group that considered options for meeting budget cuts to a major program of the organisation. Brainstorming sessions yielded a number of options but the manager chose not to share the options with her work group on the grounds that:

> …until you're actually getting to make a definite announcement that this is the way we're going to go there was absolutely no point. There were no decisions out of that until the point at which it was announced (Interview 1, page 11: branch manager).

The manager was aware of the need for confidentiality on some issues but she also took a pragmatic approach in terms of the impact on people of informing them of a range of different possibilities rather than firm decisions for action:

> You can't operate at this level as if you are an open book because also you have to actually make a judgement at the point where people can add value and one of the things you learn from experience is not to take people through a constant whirl of 'what ifs'. Because they could sure spend their lives working on 'what ifs' and being terribly anxious about 'what ifs' and none of the 'what ifs' might come about. That doesn't mean to say you don't test things but you have to make that proper judgement about the maintenance of what we do in terms of making people aware of some of the things that might be happening here (Interview 1, pages 11-12: branch manager).

The experience of another manager, one who was responsible for a significant change to one of the public programs in the organisation, was rather similar in that the organisation's clients were informed of the change only when the decision was finally made. The decision was two years in the making but when it was made an extensive communication strategy was developed for informing people within the organisation and then the organisation's clients about it. The order in which people in the organisation were informed was determined by a similar principle to that suggested by the corona of decision making: whose working lives are most affected by the decision? The manager himself took a leading role in communicating the decision internally because as he commented 'I made the decision and I was the one who had to be questioned about it' (Interview 4, page 7: branch manager).

The shaping of judgements and decisions can be distorted

The shaping of judgements and decisions can be distorted in several ways. The principles underlying the directions of an organisation, or more appropriately the different interpretations of them and priorities placed on them at different levels of management within an organisation, can be a source of tension and potential distortion as seen in an illustration already provided in this section. Other potential sources of distortion reflected in the experiences of information use related to the verification of information and confirmation of the appropriateness of judgements and decisions as they emerged.

One manager reflected at length on the situation in which both the organisation and a partner organisation were questioning the future of their long term partnership when the renewal of the contract between the two parties was being considered. Because of the uncertainty surrounding the renewal and the conditions under which it might be possible at least from the organisation's perspective, the manager began to consider 'what sort of protocols we might put into place to information share and to information veil' (Interview 15, page 19: division manager). The open sharing and full disclosure of information that had previously contributed to the maintenance of the partnership was no longer possible. The manager elaborated on the significance of this shift to the 'veiling' of information:

> It's had a huge disruptive effect because it's influenced what has been the habit of [the partner] in researching and informing itself because before all this we would use each other's information. In some cases because of certain agreed options we had to go and independently discover and inform an option we might have been exploring…It didn't necessarily mean we exchanged it all either (Interview 15, page 20: division manager).

Information could not be verified as completely as it could be prior to the questioning of the renewal of the contract. At the same time the context that shaped the meaning of information was altered. For example, the 'contextually based information supporting the accountability requirements' of the business plan and the measurement of performance against agreed indicators presented problems for the organisation when the context of the information changed (Interview 15, page 20: division manager).

The means of sharing information also moved away from conversations between the representatives of the organisation and the partner to more formal exchanges through correspondence or formal meetings, sometimes involving the executives of both the organisation and the partner. The manager's experience of information use changed too and he described it as being more like a 'maintenance activity' as he ensured that the decisions made and actions taken were consistent with the 'spirit of the agreement' between the two parties (Interview 15, page 21: division manager). These exchanges with the partner were also flavoured by some concerns about the partner's integrity and a rather diminished level of trust (Interview 15, page 21: division manager).

The potential for the distortion of judgements and decisions suggests that information use experienced as the shaping of judgements and decisions has an affective element to it. Faced with the question of the renewal of the contract with the long term partner, this manager commented that he was 'emotionally distressed by the situation' (Interview 15, page 23: division manager). There were several aspects to the distress he felt. He had committed himself to 'preserving organisational and personal relationships' and he believed that the model underpinning the partnership was an example of best practice (Interview 15, page 23: division manager).

The organisational and personal risks involved in shaping judgements and decisions were highlighted by another manager who described the public program changes that he had made as 'the biggest thing I've ever done' (Interview 4, page 8: branch manager). In the interview he demonstrated his acute awareness of the impact on the organisation of the clients' rejection of the changes that he had made and therefore of the judgements and decisions on which they were based. He expected to lose his job with the organisation if both the clients and the organisation rejected the changes. The depth of the manager's personal and emotional commitment to the program changes is signified by the fact that he took a holiday immediately after the program changes were announced to the organisation and communicated to the clients.

This was the first time that the manager had made such significant changes to one of the organisation's flagship programs and so the situation was unique in his experience. This was also the case for some others managers, including one who was involved in one of the first digitisation projects in the world, another who was negotiating the renewal of a contract with a partner at a time of changing financial viability of the partner and yet another who was involved in developing an enterprise agreement with trade unions. These situations were all new to the managers involved and to many of their senior colleagues as well.

The situations were new to the organisations and required them to make changes in response to changes in their external environments. So the situations were not only new to the organisations but they also had strategic importance in terms of enabling the organisations to meet their goals.

Structural dimension

The internal subject-object relation of the shaping judgements and decisions conception of information use, like those in other conceptions of information use, is a relation between people and information. The focal awareness in this conception is on information as a subjective construct but one imbued with principles, values and beliefs. Information takes on another dimension that transforms it and gives it added meaning and significance. The relation between people and information in this conception is characterised more by symbiosis than intimacy: information and judgements and decisions are linked by peoples' commitments to engaging with their managerial roles and organisational processes. People emerge from the process with greater understanding of their surroundings and of life in their organisational worlds.

This conception is qualitatively different to the new knowledge and insights conception because principles, values, beliefs and information are integral to the process of making judgements and decisions. The person as a knower becomes a knower in a role that involves change and movement in the environment that surrounds it and in the role itself. In the foreground of awareness is the person in a managerial role whose knowledge and experience are applied in new or unfamiliar situations. The focal awareness is on information as a transformative force able to bring about change in people and change in its own meaning and significance. By contrast, in the conception that emerges from the focal awareness on information as a subjective construct it is the person and what is known by the person that is in the foreground.

Summary

The experience of information use as shaping judgements and decisions is summarised in Table 11 that follows.

Table 11

Dimensions of the shaping judgements and decisions conception of information use

	Referential dimension	Structural dimension
Shaping judgements and decisions conception	Information use is understood as a process of shaping one's judgement and decisions by drawing together information, principles and values, and communicating those judgements and decisions to others.	What is in the foreground are new situations requiring judgements and decisions. Information, judgements and decisions are linked together by managerial roles and processes within the organisation.
Illustrative examples 'At the end of the day you can gather so much information but the decision maker or I fall back onto either a set of principles or beliefs…It's been about making a decision that asserts what are the principles that are most important'. 'I never make decisions, big decisions by myself. I always talk to people '.		

Category five: the influencing others conception

Information use is experienced as influencing others in this conception. The referential and structural dimensions of the influencing others conception are described in this section of the thesis.

Referential dimension

Three elements of the referential dimension emerged from the data. These elements are:

- influencing other people brings about changes in their understandings and behaviours
- influencing others relies on interpersonal interactions
- other people sometimes resist influence.

Each of these elements is now described using examples and illustrations from the interviews as evidence of the meanings attributed by the researcher to this category of description and to the managers' experience of information use. The examples and illustrations allow others to verify the researcher's interpretation of the evidence.

Influencing others brings about changes in their understandings and behaviours

This element of the conception can be directed by managers towards two different groups of people: those inside the organisation and those external to the organisation. Among the managers who were interviewed, some had influenced people in their own work groups, or branches and divisions and others had influenced groups external to the organisation. In the situations that were recounted by the managers the purpose of influencing others was to move the organisation forward, very often by responding to change in the external environment.

Comments made by the managers were couched in terms of a different kind of future for the organisation and those in it. In some instances there was a suggestion that the organisation could be transformed or at least brought into another space. One manager reflected on the impact of electronic delivery on the services offered by the organisation. He took as an example a recent increase in email requests by clients to the organisation and a decrease in the number of visits by clients to the organisation's building and suggested that:

> …with email you can actually rejig the system and make it more outwardly focussed…We've got to re-invent ourselves to respond to that situation. I just get sick of hearing myself. I must have said it a thousand times to people (Interview 14, page 18: branch manager).

Another manager spoke of the decision made by the governing body and senior management group of the organisation to introduce online services. She described the introduction of these services as 'the best change management agent you could ask for because it's about potential change to the organisation'. She set out the task following this decision as being one of trying to 'galvanise staff support, engagement so that we could actually bring the organisation with us in that change management process' (Interview 2, page 15: division manager). In this instance the manager's experience of information use as influencing others is embedded in the broader process of change management.

Influence directed towards people in the organisation

Because the influence directed toward people within the organisation seeks to bring about changes in people's understandings and their behaviour it sometimes challenges the *status quo* or the conventional wisdom and accepted ways of doing things in organisations. One manager outlined a situation in which the division for which she was responsible amalgamated with another division. As the manager of the enlarged division she introduced some different ways of working and observed that:

> It's a whole new way of thinking about things for some people, not for others, but very positive. So now people are starting to go, 'oh, so if I do that it might have an impact on somebody'… I'm busy and I don't think of what I'm doing has an impact on anybody else, is part of the root of almost all of that. [At this point the manager used two fingers on each hand to indicate quotation marks] 'Maybe I should ask if this has an impact on you and you can say, no it's fine with me'. But it's just remembering to ask or being aware there are those linkages (Interview 12, pages 21-22: division manager).

Another manager was also involved in the integration of two work groups, one of which needed to change its ways of working more than the other. He described the change that needed to be made in people’s understanding and suggested that this might influence people’s behaviour:

> There was this myth about the [client] and who that person was… The greatest barrier to change that we have [is] this idealised [client] who is usually an academic doing arcane research on Australian history…[The staff of the branch] have built up these personal relationships with them but actually to the detriment of other [clients]. Somebody comes along and the person in front of them will get dropped like a hot potato, the other person will be given the red carpet treatment. We’re just trying to get rid of some of that sort of behaviour (Interview 14, page 19: branch manager).

Yet another manager recounted a situation in which she was responsible for the restructure of a work group into team based units. She too suggested that changes in people’s understandings are necessary before people change their behaviour. She emphasised the need for people to work together:

> We've gone all along with this process, in the way that we've done it it’s been very much one of bringing staff with us and having staff on board and they really have…the majority of staff…have really grasped the concept of working in the new client focused teams and so on. I think they're very enthusiastic and have really been very positive about it and to me that's very important because no one person whether you’re the manager or a team leader or whatever, you can't make all this happen on your own. You've got to say, ‘Well it's forty people have got to make this happen’ (Interview 9, page 17: branch manager).

Influence directed towards people outside the organisation

Managers sometimes need to influence the understandings and behaviours of people external to the organisation so that the organisation is able to respond to a changing environment. A division manager referred to the change that needed to be made to the thinking of one of the key stakeholder groups in the organisation in relation to the development of online information services. The situation was highly politicised and the organisation’s future as a major contributor to the communities in the state was at stake. In order to influence government policy, the organisation needed to convince local councils of the significance of online information services and the network infrastructure to support them. The manager described the challenge:

> We needed to make a fundamental shift that this was…a community development initiative. This was about provisioning the community with access to services online and it wasn't just the community, it was actually a solution for the whole of the council, not simply one part of it. This could solve the problem for council. That fundamentally shifted the perception of the proposition and it began a process of shifting the perception of the usefulness of the [public] library for purposes other than providing the community with books or information. It was actually helping the council solve a problem, a much broader problem…We were able to influence, inform the strengthening and shaping of that statement and it became the key State government strategy for provisioning the citizens' access to online services. So it became a community networking strategy (Interview 15, pages 11-12: division manager).

Another manager who spoke about the experience of information use as influencing others also referred to the broadening of people's understanding, in this instance of the organisation and of the external group's role and place in relation to the organisation and its precinct. As the manager responsible for the volunteers program she was able to influence the group by developing their:

> …understanding that the organisation has goals, it has responsibilities, it has an Act of Parliament, it has compliance things that the government requires it to do, that it has a strong leadership role and that it has an organised set of strategies and priorities to achieve its mission and where they fit in that, where the volunteer program fits into that… What I wanted to do was broaden the focus of the volunteers from their very narrow tiny task-specific brief to have a feeling that they're part of something bigger within the program, within the [organisation] and within the broader [precinct] community (Interview 8, page16-17: branch manager).

According to the manager the volunteers group has responded positively to the opportunities that she has provided for them to gain a broader understanding of the organisation and of volunteering in general. Some of the volunteers are prominent members of the community, others are members of the organisation's fund raising group and yet others are major donors to the organisation. The manager acknowledged the value of the volunteers' relationship to the organisation.

The manager was aware of the resistance of some of the volunteers to changes that had been made in the past and of the need to ensure that they accepted changes in the organisation and its programs. The manager described the establishment of a forum for volunteers and staff of the organisation as 'one of my strategies I suppose or one of the ways that I'm using information' to 'help the volunteers accept organisational change' (Interview 8, page 17: branch manager). In the manager's view the volunteers are now:

> …aware of the complexity of the [organisation] and how change can happen and they can see the need for change and why it happens slowly some times, and why it happens quickly some times (Interview 8, page 11: branch manager).

Influencing others relies on interpersonal interactions

Information use experienced as influencing others requires not only information to be exchanged but also particular approaches if other people are to change their understandings and their behaviour in the interests of the organisation. Influencing others also takes time on the part of both the manager and the people they seek to influence. There is a strong affective dimension in the experience of information use as influencing others that stems from the interpersonal interactions with the people being influenced.

Characteristics of information

Managers referred to the need for evidence in influencing others and so the reliability of information becomes important. Some of the managers had carried out surveys, others had gathered evidence from different sources. The purpose of the evidence was not only to demonstrate that the current situation was no longer appropriate in assisting the organisation to meet its goals but also to indicate the scale of the change that was necessary.

The manager involved in a review of legislation had gathered:

> …a very large body of evidence if we need to present it to the [executive office of government] and other government departments…The gathering of all this and other additional information will help us in our discussions with [government] (Interview 13, page 13: branch manager).

Another manager spoke about a client survey and the value that its reliability added to the information it provided. This manager was involved in the integration of two work groups that involved major changes in the ways of working in one of the groups:

> We've come up with some quite interesting findings about who our [clients] are and what they expect of us, and what their sort of commitment is to the [organisation]. It really has overturned a lot of myths and has been quite a useful exercise in terms of this and showing the staff that the world is changing. The people don't come to the [branch] in the same way they used to in the past, that the older users are dying off and they've been replaced by people who don't have the same feeling or commitment towards the [branch] as a place or as an institution and that has made quite an impact on people. It's been quite important because it's all been scientifically done (Interview 14, page 19: branch manager).

Although this manager described the information gathering as 'a bit arduous in the sense that there are a lot of shibboleths and preconceived ideas about the way things were' he acknowledged that it was necessary in challenging people's understandings about the way the branch, and they themselves, delivered services (Interview 14, page 19: branch manager).

An observation about the value attributed to information was made by a manager as he reflected on the situation in which he was a member of a delegation to government ministers to make a case for government support of a state wide information and communication network which the organisation would lead. In his words:

> You need to know your facts…[then] it's about influencing others to put the same value or weightings on this chunk of information and the activity it surrounds or informs as I do and actually strike a chord reaching a consensus that these are the most valuable and important initiatives (Interview 15, page 15: division manager).

Another manager spoke not so much about having evidence and facts to present to others but having a rationale for making changes to one of the organisation's public programs in response to changing client needs as well as financial pressures on the organisation. He commented that 'people get upset when I make [these] changes but usually I can talk them through it and I usually have a good reason for making them' (Interview 4, page 1: branch manager).

Characteristics of the interpersonal interactions

The interpersonal interactions that feature in the influencing others conception mainly take the form of face-to-face interactions. Because they are premised on a person seeking to influence others by changing their understandings and their behaviours these interactions have an inherent political dimension surrounding them. For others to be influenced, ideas and possibilities that are unfamiliar or threatening to them have to be explained in ways that are accessible to them.

Influencing others relies very much on conversations, discussions and forums where the immediacy of communication is paramount. One manager drew attention to the forcefulness and power of face-to-face interactions in influencing others:

> The medium of information transfer that is going to have the most potency is the face-to-face contact, right from my level down to the managers and supervisors. They are the…transactions that make the difference, because in all the other formal mechanisms right through e-mail, or formal memorandas or through large audience briefings there are filters and impediments that obstruct what I'd call the closing of the cycle. People don't read all the paper junk that's on the desk. People are starting to filter information out that comes through on the e-mail because there's so much of it there now they're having a replication in their IN tray (Interview 15, page 15: division manager).

Another manager consciously used face-to-face communication in the process of influencing others who contribute to a program she manages. Because this manager has discovered that 'word of mouth is the best way' of sharing information about changes and developments in the organisation and preparing people to accept changes to their program she instituted monthly informal discussions with the group. These discussions often feature a guest speaker from the organisation so people hear information sanctioned by the organisation. As the manager explained:

> You've got to come at things from the side. You don't hit [people] with a document like this [pointing to a copy of a strategic plan] because it's too sterile and that's why we have monthly coffee mornings (Interview 8, page 17: branch manager).

This manager also made some observations about staff forums in the organisation. On two occasions around the time of the interview the chief executive officer had addressed the forums and spoken about the organisation's vision and strategic directions at a time when the organisation was adjusting to changes in its funding regime. The manager commented:

> We've had all these budgetary changes and the best thing is that we've had staff forums where [the chief executive officer]'s talked about the vision…There's just nothing like seeing interaction with another human being when it comes to things that are really threatening. It's OK when it's good news, they'll read it but when it's change that appears to be threatening…there's such a filtering (Interview 8, page 18: branch manager).

Another manager expressed a similar view but couched in different terms. He saw the advantage of such forums as a way of reducing misinformation as well as demonstrating management 'being there with the workforce'. He drew an analogy with the 'Saint Thomas principle of having the finger in the wound. Seeing is believing is a powerful, affirming influence, that what I hear is correct' (Interview 15, page 17: division manager). The manager was also very conscious of the political dimension and power relationships surrounding his experience of information use as influencing people. The organisation needed to enlist the support of local government councillors as part of a communication and lobbying network able to convey 'unvetted, unfiltered information' to government ministers (Interview 15, page 12: division manager). The organisation was seeking government support and funding for a state wide network based on a local government agency that already has in place a state wide technology and communications network, but one that needs enhancing. The manager described the challenge facing him in influencing the councillors:

> I've had to talk to [local government councils]…who can see no value in investing in the technology because they've had no exposure to it. And then trying to actually then deconstruct what seemed like a simple message to me into a powerful message to

> provoke the person I'm talking to, to challenge the ideas they have about their view of the world and how their [council] on their side needs to have this wide connection to this thing called the internet and online publishing. There's lots of other things they may be able to do such as register their dogs, they may be able to lodge their planning applications, they may be able to blah, blah, blah (Interview 15, page 9: division manager).

The political dimension of the process is also suggested in some of the descriptions that other managers used. One manager involved in introducing differentiated service levels to clients spoke about the 'tribal approach' to the idea of the service levels. Some of the professional staff felt very uncertain and threatened by the suggestion that technical staff would carry out some of their functions. The manager's approach to influencing the professional staff was to:

> ... sell to [the professional staff] the idea that [technical staff] take some of the directional fast access questions, fixing up printers, taking bookings, giving people ready reference kind of help and the [professional staff] can then move much more into research where they will be able to offer their skills…It's a bit of a selling process (Interview 6, page 9: branch manager).

The notion of a selling process is also implied in the words of the manager responsible for the volunteer program in the organisation. She is very aware of the need to motivate the volunteers and maintain their commitment to the organisation and its goals and also mindful of the possibility that it is sometimes the senior management's view of what is in the best interests of the organisation that will prevail:

> I'm in a part of the organisation that requires good news stories…I need to be upbeat. The program needs to be upbeat and so I need to analyse every situation and find … sometimes you can't do anything about the fact that this is actually not what [the volunteers] want and you just say, 'Well that's it' (Interview 8, page 18: branch manager).

Influencing others takes time

There are a number of reasons that influencing others takes time. Managers themselves need to gather information, evidence and 'facts' that might influence others and they need to consider ways of presenting information and ideas to people. The people on whom influence is being brought to bear also need time for new understandings to develop and their behaviour to change, or at least to accept the realities of change that is occurring around them. These developments and changes occur in the context of organisational change, which is dependent on many people in an organisation and also takes time.

One manager described influencing others as a 'sort of evolutionary process…we don't really want to do anything dramatic that doesn't get us anywhere' (Interview 9, page 17: branch manager). Another manager spoke of 'incremental change' (Interview 4, page 8: branch manager) in the integration of two work groups. His comment reveals an underlying reason for the time taken for the integration to occur:

> Two aides and I could have done this in an afternoon but because we've had to bring the staff with us it's taken us two years…I can understand the reasons why they are diffident and unwilling to change and all of this but I certainly can't sympathise with them (Interview 14, page 21: branch manager).

One of the managers reflected on the space she needed to sit back and consider emerging technologies as a possible new direction for the organisation as well as the time to present information about the possibility and discuss it with the people she was seeking to influence. She prepared a paper for the organisation's senior management and governing body with its credibility derived from the sources that were used and its presentation as a research paper. In the meeting where the paper was discussed with the manager she referred to the most recent information on industry trends and statistics. She reported that, after the discussion:

> …various people said to me…for the first time I understand what you mean by online and what's happening with online. For the first time I understand the strategic importance of this to the organisation. I think in a lot of these areas where things are moving quickly people intuitively do something, but they don't actually sit back and describe and explain it. It's only once you've described it that it makes sense. So what I did in a way was to describe it (Interview 2, page 5: division manager).

Her considered description in the paper as well as the face-to-face interactions with the governing body and her senior colleagues in the organisation were able to bring new understanding to some of the people she was influencing. The paper prepared by the manager had not included any recommendations or resolutions in it 'because we weren't sure we were going to carry the [governing body] with us' (Interview 2, page 6: division manager). This comment reflects both the political dimension of influencing others and the manager's caution in changing the understandings of others.

The people who are being influenced also need time and space to realign their understandings with changing circumstances and to adapt their behaviours. Another manager spoke about changing people's ways of thinking and acting so that they could appreciate the impact of their work on other people and other branches in the organisation. Again, distancing oneself from the present was understood to be important:

> The people in the main are positive and want to give a good service but they don't step back one and go oh, wonder if I talk to so and so whether I could actually give a better service (Interview 12, page 22: division manager).

Stepping back was also seen as necessary by another manager. In this instance the distancing was a very conscious process for the people involved:

> My observation was that there was a lot of managers who had not moved in their thinking…so we actually needed to go back a step and actually give them that opportunity and we did all these sorts of exercises with a very good facilitator I've used a few times…I always find [it] to be a very challenging experience in different ways, but people move (Interview 1, page 6: branch manager)

Although some people directly acknowledge that they have changed their thinking, as seen in an example already given, other people indicate a new understanding in more indirect ways. One manager noted that some of the new ideas and approaches that have been introduced are now 'being quoted in other people's documents' (Interview 12, page 15: division manager). Another manager spoke about repeating himself until 'they start to tell you back what you're telling them. Then you're sure they understand what you're talking about' (Interview 14, page 21: branch manager). Yet another manager noticed that:

> ...you could almost physically see people deciding, yep, I'm going to get really engaged in this and almost from the moment I could see that happen I felt a lot lift from my shoulders (Interview 9, page 17: branch manager).

A strong affective dimension

The experience of information use as influencing others has a strong affective dimension that stems mainly from the interpersonal interactions on which influencing others depends. The interactions among people need to be open and so trust among people is important. In the organisation, managers need to trust the people they work with and the people that managers work with need to trust their managers. Apart from trust in people, a trust in the future of the organisation and the organisation's capacity to develop also emerged.

One of the managers suggested that in an organisation trust is built over time and that it is essential for moving an organisation forward. This is especially so in turbulent times in a rapidly changing environment:

> I think that as the tensions get higher there's the desire too on the part of everybody to want to know what is correct and what is reliable and most people now have that experience and are more inclined to build trust over a series of experiences of face-to-face contacts, and you surround that discreetly then with appropriate information to effect the movement forward. I think that's going to be fundamental for us here [in this organisation] (Interview 15, page 15: division manager).

Another manager referred to the effectiveness of openness in the interactions among people. She was involved in the integration of two work groups and suggested that talking about some of the difficulties that arose in the integration process allowed some people to change their understandings of the changes taking place in the organisation and the work groups and others to accept the reality of the changes taking place. The manager described the situation and her response to some of the difficulties in moving people between the two groups:

> In some ways it had started as being a determination [by some people] that it would be impossible for us to start moving staff across both branches because there's this set of competencies required over here in this branch that will take you forever to get. So there was a little bit of thinking, certainly from me, that it was important that all of this came out, that we really talked about it and didn't ignore it. It seemed that it needed to have a kind of recognition and then we'd move on (Interview 6, page 4: branch manager).

Some of the managers commented on their obligation to hear what others were saying in the interactions. The manager who influenced others to consider the impact of their work on their team members and colleagues in other parts of the organisation as part of the development and implementation of an organisation wide strategy expressed surprise that 'people realised that I wanted to listen to what they had to say and that was a novel experience for some of them, that someone was actively listening and wasn't just there with their own agenda (Interview 12, page 5: division manager). Another manager commented that although 'we will try and change their thoughts if we think they're thinking along the wrong track…I believe if we don't hear what they're saying we would then not be providing leadership' (Interview 13, page 27: branch manager).

Influencing others requires commitment to principles and values on the part of people who seek to influence others. The manager who joined the delegation to government ministers to put forward a case for supporting a state wide information network spoke about the difference that such a commitment made during the meeting with the ministers. The meeting had reached a point that the manager described as 'a moment of truth' and he thought 'I've just got to draw down on the very things I really do believe in and what makes me passionate about the work I do…I feel that is what made the difference' (Interview 15, page 13: division manager). The delegation's case, backed up by evidence and facts that could be verified by the ministers' staff as well as by the discussion during the meeting, was accepted.

The manager reflected on his feelings during the moment of truth and spoke about finding:

> ...a confidence and public confidences. I felt I had the information and the knowledge. I just simply had to marshal it and present it orally in a compelling way at the time…Personally I was deadly nervous and I remember saying to myself, I have to marshal every ounce I've got in my head, and there was a part that was absolutely exhilarating about that. I felt I was right on the edge, this was make or break time (Interview 15, page 22: division manager).

Another manager also spoke about gaining confidence through her experience of information use as influencing other people. In reflecting on the restructuring of the work group she manages and developing new ways of working she observed that:

> I've got so much confidence [now] and I've seen so many other people do so many good things that I've just got that trust that everything is going to be all right (Interview 9, page 17: branch manager).

This manager also realised that 'one of the things I've learnt out of this is that I've had to learn to give up control' (Interview 9, page 17: branch manager). In other words, she has learned to trust others and place her confidence in the organisation as well as in herself.

Other people sometimes resist influence

Although managers might take great care in gathering evidence, presenting it and engaging in face-to-face communication with others in order to change their understandings and their behaviours, some people resist influence and making the changes that are sought. One manager saw this resistance as 'the natural caution and conservatism, territorial [ways of thinking]' of people who 'don't want things to change and …even when it's put in front of them they can't cope' (Interview 2, page 14: division manager). Another expressed his frustration with 'just acting as a go-between like being the meat in the sandwich and trying to engage people in the process, even though you know that they don't want to do it' (Interview 14, page 18: branch manager).

Sometimes the change in the organisation occurs with the passage of time and some of the people who resisted the influence of their managers remain in the organisation. There is no clear indication that the people concerned have in fact changed their understandings. One manager involved in the integration of two work groups described the situation as being one where:

> …a lot of people really haven't come to terms with the new ways of working, team-based structures and we do have a lot of individuals, people who sort of in the traditional academic mould they like working alone and sort of going off and doing things they want to do rather than things that are for the benefit of the organisation as a whole. They can see those days drawing to a close and essentially fought tooth and nail to maintain the *status quo* but the evil day finally has arrived, and we do have an integrated structure (Interview 14, page 16: branch manager).

The manager draws attention to the benefit of the organisation in the integration and he expresses a sense of the weight and force of the organisation in such a situation compared to that of an individual member of it:

> The sort of mantra that I've just been repeating to them over and over again is either you become part of the change or you become road kill. You're just going to be squashed by the juggernaut that's going to sweep over you, pointing out the fact that [organisations like us] throughout the world are all undergoing change (Interview 14, page 18: branch manager).

At other times, people modify their expectations of the group they are seeking to influence. In one situation the organisation was a member of a project consortium that was keen to establish a relationship with a vendor different to the usual buyer-seller arrangement. As the manager described it:

> They were used to providing a service for a fee whereas we were looking outside that traditional relationship and tried to include them as partners in a sort of a learning group but they kept sort of pushing us back and didn't want to be involved. They regarded a lot of the information that we provided them with as unnecessarily bureaucratic and prescriptive. Their argument was that it stopped them from getting on with the job (Interview 14, page 7: branch manager).

The vendor did not enter into the relationship as planned by the consortium because in the manager's view:

> They never really understood what we were trying to do even though we spoke to them in plain English as I'm speaking to you now. They just stopped and couldn't accept the additional thought processes that we would have had to go into in the more informal and learning team arrangement (Interview 14, page 7: branch manager).

The final outcome of the project was delivered only because the consortium compromised on the standards that had been developed originally to provide the vendor with clear expectations. The standards proved to be unrealistic in light of the budget for the project and the demands on the vendor's time (Interview 2, page 8: branch manager).

At yet other times people resisting influence might remove themselves from the situation and from the possibility of influence. The manager involved in introducing a digital strategy across the organisation commented that a group of people had removed itself from meetings and discussions. In the words of the manager the particular group was the one:

> …most threatened by this [strategy] and felt it should have ownership of it all. They just started boycotting the meetings and they just stopped coming…They just weren't there for the last two meetings…basically because they think it's all theirs…nobody else should be involved…None of the other [groups] has done this (Interview 2, page 6: division manager).

At the time of the interview the group was still outside the process and not participating in the strategy.

Structural dimension

The internal subject-object relation of the influencing others conception of information use emerged once again as a relation between people and information. The focal awareness in this conception is on information as a subjective construct imbued with principles and values and beliefs. Information has the capacity to transform those who influence others as well as those who are influenced to change their understandings and their behaviours. The relation between people and information is symbiotic and it is characterised by interdependence among people, their roles and the environment in which those roles are enacted. Information and influencing others to change their understandings and behaviours are linked together through the future of the organisation, the movement towards its goals and the benefits that information as a transformative force can bring to an organisation.

It is because the organisation and its interests are in the foreground of awareness in this conception that it is qualitatively different from the shaping judgements and decisions conception. By contrast, the person in the managerial role is in the foreground of awareness in the shaping judgements and decisions conception but it is the organisation that is in the foreground in the influencing others conception.

Summary

The experience of information use as influencing others is summarised in Table 12 that follows.

Table 12

Dimensions of the influencing others conception of information use

	Referential dimension	Structural dimension
Influencing others conception	Information use is understood as influencing others to change their understandings and their behaviours.	What is in the foreground is the future of the organisation and the people who work in it as well as the changes that need to be made by the organisation. There are linked by the forward movement of the organisation.
Illustrative examples 'With email you can actually rejig the system and make it more outwardly focussed…. We've got to reinvent ourselves to respond to that situation'. 'The medium of information transfer that is going to have the most potency is the face-to-face contact…They are the transactions that make the difference '.		

Summary of categories of description

The five categories of description that denote the phenomenon of information use as it is experienced by the managers participating in the study:

- the information packaging conception
- the information flow conception
- the new knowledge and insights conception
- the shaping judgements and decisions conception
- the influencing others conception.

These categories of description illustrate four distinctive features of categories of description outlined in the literature of phenomenography (Marton 1988: 181). Firstly, the categories are relational in that they focus on the subject-object relations of the conceptions they denote. The subject-object relations in the experience of information use were between people and information. Three different subject-object relations were discerned and these are elaborated in the next section of this Chapter of the thesis. Secondly, the categories of description are experiential. They are based on the experiences of managers' information use and so they adopt a second order perspective. Managers were invited to reflect on their experiences of information use rather than provide their views on what constitutes information use. Thirdly, the categories of description are content oriented and so they focus on the meaning of the phenomenon of information use. This feature is evident most clearly in the discussion of the referential dimension of each category. Fourthly, the categories of description are qualitative in the sense that they are descriptive and rely on language. The examples and illustrations drawn from the interviews with managers rely on language for both their expression and their interpretation by the researcher.

The analysis of the data in the form of the set of categories of description of the phenomenon of information use meets the criteria for the quality of a set of categories suggested by Marton and Booth (1997: 125). First of all, the set of categories reveals something distinct about ways of experiencing a phenomenon. It is this criterion that enables the conceptions to reveal themselves and the researcher to construct the categories of description. Then, each category stands in a logical relationship with the other categories. This relationship is implied in the order in which the categories are described and reflects both the internal subject-object relations and the structure of awareness underlying each category. Finally, the number of categories is limited. In this study five categories of description revealed qualitatively different ways of experiencing information use. These categories are summarised in Table 13 that follows. The Table brings together the summary figures presented at the end of each category of description.

Table 13

Structural and referential dimensions of conceptions of information use

Conception	Referential dimension	Structural dimension	Illustrative examples
Information packaging	Information use is understood as a process of packaging and repackaging existing information in a different form and format so that it is accessible to others	What is in the focal awareness is information as an object and the actions associated with assembling information for others. Information is packaged and repackaged in a linear and finite fashion	The process is one of 'being able to get information in, manipulate it around and put it back out again'. 'I did a lot of gathering and compiling, pulling together…getting things compiled and written and explaining, pulling together the documentation.'
Information flow	Information use is understood as enabling the flow of information by transmitting it to people or exchanging it with them	What is in the focal awareness is information as an object that flows in different directions and through different channels in an organisation. Information and the different channels of information flow are linked together by the structure and culture of the organisation and the capabilities of people as communicators	'Personally I find an open exchange of information a much more natural and conducive way of operating and I think it achieves better outcomes'. 'We actually had staff from all over the place who wanted to be there come along and brainstorm what our web site should contain, where it should be and out of that they did sort of mind maps. We put all that together and came up with outcomes which started to inform these strategies'.

Developing new knowledge and insights	Information use is understood as developing new knowledge and insights through a process that has a forward looking orientation that has cognitive and affective elements to it	What is in the focal awareness is information that is internal to people and a disjunction between current states of knowledge and knowledge required for a program that is unfolding. Information and new knowledge and insights are linked through the changing significance and meaning attributed to information.	'I know that I have moved on but I think sometimes other people haven't moved on as well and I've made an assumption that they have'. 'The way you use information is that you might have it for something else and it's that ability to reapply it back because the situation's changed and just think: I knew that before and that was what I tried to do and it didn't work but now I can use it again because this time it will work'.
Shaping judgements and decisions	Information use is understood as a process of shaping one's judgement and decisions by drawing together information, principles and values, and communicating those judgements and decisions to others	What is in the foreground are new situations requiring judgements and decisions. These are linked to the organisation through its best interests and ongoing development	At the end of the day you can gather so much information but the decision maker or I fall back onto either a set of principles or beliefs…It's been about making a decision that asserts what are the principles that are most important'. "I never make decisions, big decisions by meself. I always talk to people.
Influencing others	Information use is understood as influencing others to change their understandings and their behaviours	What is in the foreground is the future of the organisation and the people who work in it as well as the changes that need to be made by the organisation. Information and the future are linked by the forward movement of the organisation	'With email you can actually rejig the system and make it more outwardly focussed… We've got to reinvent ourselves to respond to the situation'. 'The medium of information transfer that is going to have the most potency is the face-to-face contact…They are the transactions that make the difference.

Outcome space

The outcome space of the phenomenon of information use is briefly described and presented in the form of a diagram. The outcome space includes the set of categories of description and the relationships between them. In the same way that the categories of description denote conceptions, or ways of experiencing a phenomenon, so the outcome space denotes the phenomenon it describes. The outcome space is based on the collective experience of information use of the managers participating in the study.

The levels in the outcome space reflect the internal subject-object relations. On the first level are the two categories of description where the relation is between people and information as an object. The two categories denote the information packaging and information flow conceptions of information use. On the second level is the category of description where the relation is between people and subjective information. This category denotes the new knowledge and insights conception. On the third level are the categories of description where the relation is between people and transformative information. These categories denote the shaping judgements and decisions and the influencing others conceptions. The outcome space reflects the logical relationships among the conceptions in terms of the subject-object relations.

The categories of description and the conceptions they denote increase in complexity through the levels with the simplest at the first level. Information is an object external to people, a physical entity with constant meaning and significance. At the second level, information is subjective, a construct created by people in making sense of their worlds and with meaning shaped by the knowledge and experience of people. At the third and most complex level, information is internal in the sense that it is a construct created by people. It is also imbued with principles and values so its significance can change and it has the capacity to transform people's understandings and behaviours.

The placement of the conceptions on the left and right hand sides in the outcome space reflects the foreground of awareness in each conception and derives from the structural dimensions of each category of description. On the left hand side are the conceptions in which the person is in the foreground. These are the information packaging and new shaping judgements and decisions conceptions. In both of these conceptions the person's focus is on personal activities and development. On the right hand side are the conceptions in which the organisation is in the foreground. These are the information flow and influencing others conceptions. The focus is on the development of the organisation. In the foreground of the new knowledge and insights conception is both the person and the organisation. Although new knowledge and insights are developed by the person it is the organisation where the new knowledge will be applied.

The outcome space denoting the phenomenon of information use is represented in Figure 9 below.

Figure 9

The outcome space denoting the phenomenon of information use

<table>
<tr><td></td><td>Manager in foreground</td><td>Organisation in foreground</td></tr>
<tr><td>Level 3
information as
transformative</td><td>Shaping judgements
and decisions</td><td>Influencing others</td></tr>
<tr><td>Level 2
Information as construct</td><td colspan="2">New knowledge
and insights</td></tr>
<tr><td>Level 1
Information as object</td><td>Packaging information</td><td>Information flow</td></tr>
<tr><td></td><td>Manager in foreground</td><td>Organisation in foreground</td></tr>
</table>

The outcome space represents the final stage in the analysis of the experiences of information use recounted by the managers participating in the study. The concluding Chapter of the thesis follows.

Chapter 7

Conclusions and implications

This final Chapter of the thesis places the findings of the empirical study in the context of the conceptual framework of the study and relates the study to the broader theoretical location of the thesis. Before doing so though the quality of the study needs to be determined as a way of signalling the level of confidence that can be attributed to the outcomes of the study and by extension, the thesis that is presented. The Chapter addresses four topics:

- the quality of the study
- the study and its conceptual framework
- information use
- implications of the thesis.

Quality of the study

In an earlier Chapter of the thesis the empirical framework of the study was outlined and criteria for establishing the quality of the thesis were proposed. The criteria drew on the work of Ashworth and Lucas (2000) and were presented as two sets: one pertaining to the requirements of phenomenography and the other to the requirements of rigour in the study. In the section that follows the criteria are applied to the study. Each criterion is presented in italics and the researcher's assessment of its application follows.

Set 1: Guidelines for establishing that the study conforms to the knowledge interest of phenomenography

i. *The outcomes of a phenomenographic study should demonstrate the relation between the meaning and structural dimensions of the categories of description that denote the conceptions.*

The categories of description of information use presented in the previous Chapter outline the referential or meaning dimension and the structural dimension of each category and the relation between these dimensions. It is the researcher's interpretation of this relation that is used to denote the variation in people's experience of information use. The categories of description that emerged from the analysis of the data denote five conceptions of information use. The categories of description and the conceptions they denote are:

a. Category one: the information packaging conception
b. Category two: the information flow conception
c. Category three: the new knowledge and insights conception
d. Category four: the shaping judgements and decisions conception
e. Category five: the influencing others conception.

The relation between the referential and structural dimensions in each category of description is outlined in the text that presents the analysis of the data and summarised in the Table that follows each category of description as well as in the summary figure of all conceptions, Table 13, that appears towards the end of the previous Chapter.

ii. *The conceptions that are discovered in the data should reflect the internal subject-object relations or human-world relations.*

The internal subject-object relation that is implicit in the phenomenon of information use as experienced by the participating managers is reflected in the conceptions. It was found that the internal subject-object relation between people and information use is more appropriately understood as a relation between people and information. The relation varied in three ways according to whether the relation was between people and information understood as an object, between people and information understood as a construct they developed or between people and information understood as a transformative force. This internal relation underpins the variation in the experience of information use that is revealed in the study.

Set 2: Guidelines for ensuring the rigorous conduct of the study

i. *The researcher should tentatively identify the broad objectives of the research and the phenomenon under investigation, recognising that the meaning of this area might be quite different for the research participants.*

The researcher used the literature from the fields of information science, organisation theory and management to assist in shaping the research objectives. While this literature addresses different approaches to the phenomenon of information use, the researcher adopted no single approach to the phenomenon in designing the study, implementing it or analysing the data gathered through interviews with the research participants. The terms 'information' and 'information use' were used consistently by the researcher, allowing the participants to use alternate terms such as 'data', 'knowledge' and 'wisdom' when they thought it appropriate. It is evident from the internal subject-relations that emerged from the study that the participants used the term 'information' in different ways and that the researcher was able to recognise the different meanings that attributed to the terms 'information' and 'information use' in the situations in which information use was experienced.

ii. *The selection of research participants should avoid suppositions about the nature of the phenomenon or the nature of conceptions held by different types of people while observing commonsense precautions about maintaining variety of experience.*

The research participants, senior managers, were selected primarily because of their reliance on information in their work roles, as established in the literature surveyed. The research participants were selected for reasons other than suppositions about the precise nature of their experiences of the phenomenon being explored, information use. Variety of experience was sought through the interview agenda that was based on each participant's experience of information use in two different situations.

iii. *The most appropriate means of obtaining an account should be identified allowing maximum freedom for the participant to describe their experience.*

The researcher decided that the interview was the most appropriate means of obtaining experiential accounts. The interview offered an immediacy of communication conducive to the relating of experiences and at the same time it allowed for any necessary clarification or expansion of the narratives as they unfolded. The interview also offered efficiencies to the participants given the demands on their time and attention. Documents given to the researcher at the time of the interview and notes made immediately following the interview were supplementary sources of data. These supplementary materials were used by the researcher to recreate the interview when listening to the tapes and reading the transcripts of the interview during the analysis of the data.

iv. *In obtaining experiential accounts the participants should be given the maximum opportunity to reflect. The questions posed should not be based on researcher presumptions about the phenomenon or the participants but should emerge out of the interest to make clear the participants' experiences.*

There is evidence in the taped interviews and in the transcripts that the participants were able to reflect on their experiences. The interviews were loosely structured and took the form more of a one-sided conversation than an interrogation. The interviews were planned for about an hour to give the participants time to gather their thoughts and reflect on their experiences during the conversation.

v. *The researcher's interviewing skills should be subject to ongoing review and change made to interview practice if necessary.*

The review took place after each interview when tapes were replayed and notes read as well as when the transcripts were reviewed. As a result of the review of taped interviews during the study's pilot, the researcher became aware of the need to appreciate the value of silence to the participants and to allow time for long pauses. This aspect of the researcher's interview practice was monitored during the replay of the taped interviews and changes made as necessary.

vi. *The transcripts of the interview should be aimed at accurately reflecting the emotions and emphases of the participants.*

Rather than rely only on the transcripts for reflecting the emotions and emphases of the participants the researcher also made use of the taped interviews and the notes taken following each interview. In this way the nuances of the interview were created for the researcher and assisted in the analysis of the participants' experiences.

vii. *The analysis should continue to be aware of the importation of presuppositions and be carried out with the maximum exercise of empathic understanding.*

The focus on variation in ways of experiencing phenomena that is characteristic of phenomenography assisted the researcher to avoid the importation of presuppositions. The study required the researcher to attend to uncovering variation rather than the testing of a model. The research approach demanded that the participants' voices be heard and their conversations be interpreted with respect and humility on the part of the researcher. It was possible for the researcher to enter the study with presuppositions bracketed and with an ear and stance oriented to the participants' experiences.

viii. *Analysis should avoid premature closure for the sake of producing logically and hierarchically related categories of description.*

Because the process of analysis was extensive there was ample opportunity for the researcher to consider alternate placements of the participants' experiences in the categories of description. It took considerable analysis and some time for the categories of description and the conceptions they denote to stabilise. The categories and the outcome space were finally confirmed only when the analysis was presented in its final written form in this thesis.

ix. *The process of analysis should be sufficiently clearly described to allow the reader to evaluate the attempt to achieve bracketing and empathy and trace the process by which the findings emerged.*

The process of analysis has been described in some detail in an earlier Chapter of the thesis. The description of the process seeks to outline the gradual emergence of the findings and the evolution from the data of the conceptions and the categories of description that denote them and the outcome space and the phenomenon that it denotes. On the basis of this description the reader is in a position to evaluate the effectiveness of the process of analysis in achieving the rigour that an empirical study requires.

On the basis of this application of the criteria for determining the quality of the study, the researcher is satisfied that the study meets the criteria and that the findings of the study can be accepted with confidence. It is the researcher's view that the study contributes to what is known about information use and that it enhances understanding of this fundamental concept in information behaviour. Moreover the study offers a person centred view of information use. One of the questions that shaped the study was: Is there a methodology appropriate to a person centred view of information use" The response is therefore a positive one.

The study and its conceptual framework

The conceptual framework that shaped the study was drawn from an analysis of the literatures in information science, organisation theory and management. Two themes emerged form this analysis and shaped the study: information use in organisations and managers' information use. The outcomes of the study of managers' experiences of information use can be related to these two themes.

Information use in organisations

The review of the literature identified several topics germane to information use in organisations. They included perspectives on information in organisations, perspectives on information use in organisations, typologies of information use in organisations and factors supporting the use of information in organisations. The outcomes of the study offer insights into each of these topics.

Perspectives on information in organisations

There is evidence from the study that an information model of organisations as developed by Choo (1991) is tenable. Although the study does not attempt to develop such a model its outcomes suggest that in information terms an organisation is an information processing system. Information use is experienced in an organisation as a rational process, for example in the information packaging conception where information use is experienced as a three phase process with clearly defined beginning and end points. Information use is also experienced in an organisation as an enactment process, for example in the shaping judgements and decisions conception where information use is experienced as a transformative process with no clear phases but fuzzy end points where decisions emerge. This variation in the experience of information use in organisations supports Choo's (1991: 46) assertion that both the decision making and enactment perspectives on organisations need to be considered in an information model of organisations. While this assertion has some credibility at an intuitive level, the conceptions of information use uncovered in the study lend some empirical support to it.

The information continuum and the distinctions that are drawn among data, information, knowledge and wisdom by such writers as Mutch (1999), Davenport and Prusak (1998) and Nonaka and Takeuchi (1995) are also supported by the outcomes of the study. Nonaka and Takeuchi (1995: 58) acknowledge that the terms 'information' and 'knowledge' are used interchangeably, but the distinction they draw between the two resonates with the study's outcomes: knowledge, as distinct from information, is about beliefs and commitment, it involves action of some kind directed towards an end and it is about meaning. This distinction reflects the different subject-object relations revealed in the study and the understanding of information implicit in each. Nonaka and Takeuchi's (1995: 58) knowledge is very similar to information understood as a construct and a transformative force with information understood as an object being essential to the creation of knowledge.

The flow of information in organisations is critical to their ongoing development and the achievement of their goals (Nonaka and Takeuchi 1995; Abell and Winterman 1995b). The processes of socialisation, externalisation, combination and internalisation that characterise the interactions of explicit and tacit knowledge are evident in the conceptions of information use. Socialisation depends on the sharing of experiences, externalisation on articulating tacit knowledge, combination on systemising a knowledge system and internalisation on developing tacit knowledge (Nonaka and Takeuchi 1995: 62-70). There are elements of these processes in the conceptions of information use as a whole. The processes depend also on communication, interpretation and learning, all processes germane to information use as experienced in the study.

Although the information flow conception rests on information understood as an object the different views of information revealed in the study are consistent with the notions of information and information flow suggested by Abell and Winterman (1995) as being important to the performance of organisations. It must be acknowledged that organisational performance was beyond the scope of the study. However, given that some of the situations explored in the interviews concerned the experience of information use in achieving the organisation's objectives it is possible to this extent that the study tentatively links information use and organisational performance.

Perspectives on information use in organisations

The survey of the literature identified two different perspectives on information use in organisations. One of these, exemplified in the work of Choo (1998b), presents an information perspective on organisations so that the organisation offers an environment within which certain information processes are enacted. The other perspective is exemplified in the work of Browne (1993) and Johannessen *et al.* (1997) and presents an organisation perspective so that organisational processes offer an environment in which information use occurs. Central to both perspectives is the notion of the information 'doer' and more particularly the Debater, an actor who shapes and is shaped by the organisation and whose information use is affected by characteristics that are both personal in the form of information capabilities, learning style and psychological preferences and contextual in terms of work group and work role (Byström 1999: 88).

Neither of these two perspectives was supported in its entirety by the outcomes of the study. One explanation might lie in the higher priority accorded by the perspectives to the organisation rather than to individuals such as the Debater in the organisation. Another explanation might lie in the derivation of the models from previous research. Choo's (1998b) model of the knowing organisation stems from the theoretical and empirical literature in information science, organisation theory and management. Browne's (1993) model emerged from propositions based on models of decision making as well as an empirical study. The negotiation model developed by Johannessen *et al.* (1997) is based on negotiation conceived as a problem to be resolved. In other words, the starting point for the models is abstracted from observations of information and its use rather than grounded in the experience of information use. The models lack some of the immediacy of people's experiences and more importantly, of the variation of those experiences.

An information perspective on information use

Choo's (1998b: 17-18) model of the knowing organisation encapsulates three information processes: sense making, knowledge creation and decision making. In terms of information use sense making is evident in the building of consensus or shared meaning for collective action (Choo 1998b: 89). This process occurred in the study most clearly in the conceptions where information use was experienced as information flow and as influencing others. Knowledge creation relies on the mobilisation of internal knowledge and the exploitation of external knowledge in a social process (Choo 1998b: 140). In the study this process was revealed in the conceptions where information use was experienced as developing new knowledge and insights and shaping judgements and decisions. In both of these conceptions social processes of communication supported the monitoring of new knowledge and insights and the emergence of judgements and decisions. Choo's (1998: 190) suggestion that decision making is in part a process structured by routines and rules was not reflected as clearly as the other two information processes in the study. Information use experienced as the shaping of judgements and decisions revealed that decision making is sometimes intuitive and not always a discrete activity. The study's outcomes though do support Choo's (1998b: 201) assertion that the decision making process has an affective dimension.

An organisation perspective on information use

The organisation perspective on information use adopted in Browne's (1993) model developed one proposition relevant to the outcomes of the study. Focussed on the information behaviour of a decision making group, the proposition represents the actions of a collective rather than of individuals (Browne 1993: 187). Some of the information behaviours of the collective that are reflected in the experiences of information use related by managers in the study include:

- the use of information for general background and enlightenment in the decision making process. In the study this is experienced in the new knowledge and insights conception.

- request that information gathered should be targeted to the problem at hand. In the study the targeting of information by signifying its priority and managing its flow emerged in the experience of information use as information packaging and information flow. It would seem that this request might be linked to a view of information as an object.

- ensure that information that is gathered is authoritative. In the study the concern for the authority or credibility of information is revealed in all conceptions of information use. The quality of information is of concern in all information processes associated with experience of information use.

There is one element of the proposition that is contrary to the experiences of information use revealed in the study. The decision making group depends ' more often on information in written form than on information presented orally' (Browne 1993: 187). In the study the experiences of information use revealed a greater reliance on information in oral form than in written form, particularly in the conceptions of information use that relied on information as a construct and as a transformative force.

The methodology of Browne's (1993) study involved content analysis of the documentation surrounding a particular decision making process. Whether interviews with the decision making group would have led to the same proposition is not known but the research approach might explain in part the reliance of the group on information in written form.

Propositions are also a feature of a model of information management in negotiations developed by Johannessen, Olaisen and Olson (1997). Of particular relevance for the study are the propositions that assume information use in problem definition, information processes for the exchange of information and communication and establishing the value for each party to the negotiation. The propositions are developed in the context of win-win and win-lose situations. It was thought by the researcher prior to the study that the model might be relevant to some of the experiences of information use related in the interviews in the study but this was not the case even in one situation that involved the renegotiation of a contract by one of the managers with a partner organisation. At the time of the interview it seemed that the situation and the negotiations surrounding it could not be classed as either win-win or win-lose. These were not the terms in which the situation was understood by the manager who related the experience, although he did refer to the exchanging of information between the parties as information sharing and information veiling.

Although the information and organisation perspectives on information use in organisations were not reflected precisely in the study's outcomes they were useful in shaping the study and indicating the breadth and complexity of information use. These perspectives offered different interpretations of information use in organisations and many of these resonate with some of the details in the categories of description that denote the different conceptions of information use.

Typologies of information use in organisations

The typologies of information use drawn from the literatures of information utilisation and decision making have been used by management scholars to explore information use in organisations. Pelz's (1978) modes of information utilisation as instrumental, conceptual and symbolic have been used in a recent study of strategic and tactical decisions (Diamantopolous and Souchon 1996) and of new product development in an organisation characterised by rivalries among functional units (Malz, Souder and Kumar 2001).

Although the application of the three modes in these particular studies yielded some conclusions about how information is used, the three modes of information use/utilisation are not supported by the outcomes of the study of information use. For example, in one of the studies reported in the literature conceptual use of information was linked to strategic decisions and instrumental or symbolic use to tactical decisions (Diamantopoulos and Souchon 1996: 133). In the study of the experience of information use two conceptions were revealed in situations that involved the achievement of the organisation's gaols: new knowledge and insights and influencing others. The subject-object relation that underpins these two conceptions is one between people and information as a construct and the other between people and information as a transformative force. It is difficult to determine whether information use is instrumental, conceptual or symbolic because the basis for such a determination is the purpose of information use. Yet the study demonstrated that the relation between people and information is a very direct one mediated simply by different kinds of decisions.

The literature of decision making suggests that information is used as both a sign and a symbol (Feldman and March 1981). Again the outcomes of the study offer little support to this assertion. Decision making features in only one of the five conceptions that were revealed in the study and although decision making is an important process in organisations there are other processes that feature in the experiences of information use in organisations. These include information packaging, enabling information flow, developing new knowledge and insights and influencing others. The variation in the experience of information use suggests that decision making might be overemphasised as a key process in organisations and that there are other processes that are significant in terms of the information use and the ongoing development of organisations.

Factors supporting information use in organisations

The factors identified in the literature as supporting or enhancing information use in organisations fall into three domains: factors related to information, to the organisation and to human factors in organisations. Sometimes the factors in these domains are seen as barriers to information use.

The information domain

Although some of the literature approaches these factors in relation to formal information systems (for example Mintzberg 1974) it should be noted that the categories of description that denote conceptions of information rarely featured formal information systems and information technology. This suggests that for the managers participating in the study information technology is not seen as a barrier to information use. Even in the interviews based on situations involving the application of information technologies, the development of an information technology strategy for the organisation or the execution of digital information projects, the technologies themselves were not the focus of the experiences that were described. This focus is contrary to Bruce's (1997a) analysis of information literacy where one of the conceptions that emerged was the information technology conception with information technology as the focus of attention.

The key factors in the information domain outlined in the literature are the scope and quality of information. The outcomes of the study point to the variety of forms and formats in which information is experienced. The information packages that were given to the researcher and demonstrated during the interview ranged from booklets to policy statements, from brochures to information on an electronic whiteboard, and from web sites to annual reports. While these are examples of written information packages, different forms of oral information exchange were mentioned in the interviews. These included informal meetings over coffee, staff forums, formal meetings with agendas and meeting papers, planned information sharing sessions and deputations to government ministers.

The importance of the quality of information in supporting information use is implied in the conceptions that emerged from the study. The criteria for determining quality are context dependent. In the information packaging conception, quality refers to both the credibility of information sources, whether printed or oral, and the accuracy of information. In the information flow conception the timeliness of information and its relevance to others becomes important. In the influencing others conception the evidential value of information and its reliability are important criteria for determining the quality of information.

The organisation domain

Two factors identified in the literatures of information science, organisation theory and management as supporting information use are information culture and information flow. Norton (1994), Ginman (1987), Abell and Winterman (1995b) and Widén-Wulff (2000) suggest that the ideal information culture for supporting information use is one that is open and adaptive and integrates information into business processes. It also takes account of information ethics and values such as the right to know and the confidentiality of information.

The outcomes of the study support this view of a productive information culture. For example, in the situations where information use was experienced as information flow, openness in the sharing of information was felt to lead to better outcomes for the organisation because any problems could be resolved as they arose. The chief executive officer is seen to have a role in modelling acceptable information behaviour and is expected to be open and flexible in the exchange of information. In the situations in which information use was experienced as influencing others, managers are expected to hear the voices of others as they build consensus. They are also expected to give people the time and space to develop new knowledge and insights and to adapt their understandings and behaviours to changing circumstances. In the situations in which information use is experienced as the shaping of judgements and decisions the people who are affected by decisions can expect to be informed of them although their wishes might not always be met. It was acknowledged by some managers that communication in a large organisation can be difficult but it must be addressed.

Information flow as an aspect of information culture in organisations has been studied quite extensively. The traditional categorisation of information flow as formal and informal has been challenged by Lievrouw and Finn (1996) who have remarked on the increasing informality of information flow as a consequence of the widespread application of information and communication technologies and the shift towards an involving information environment. Information flow as an element of information culture has a potential impact on the performance of an organisation.

In the experiences of information use that emerged from the study several barriers to information flow were identified. Some of these arose in situations where information use was experienced in ways other than information flow. For example, in the experience of information use as information packaging an insistence on the development of a business plan was seen as a brake on the progress of a project. When the experience of information use is understood as influencing others a political dimension is introduced into interpersonal interactions and some people resist change in their understandings and behaviours and choose not to adapt to changing circumstances. In the new knowledge and insights conception the experience of information use highlighted for some people the extent to which they had moved in their thinking, so much so that they felt they had to find new ways to engage with their colleagues and create new mechanisms for talking with them. One of the mechanisms under consideration was an informal group set up to exchange information and to restore information flow.

When information use is experienced as information flow there is an assumption that people are willing to exchange information and to use the information channels that are in place in an organisation. In the study, one of the impediments to information flow that was experienced was an interruption to information flow that arose from information not being passed on to the person concerned. The impediment was seen in part as a reflection of the organisation's information culture characterised by closure rather than openness and in part as a reflection of the organisation's structure that has no consistently clear reporting lines and accountabilities.

The human factors domain

The major factor in this domain that is related to human information processing and identified in the literature as impeding information use in organisations is information overload. This is a contested concept associated with an increasing volume of information and diversity of information forms and formats. It is also associated with a changing view of decision making as an intuitive, constructivist process rather than as the exercise of choice among alternatives. The literature offers strategies for addressing information overload. These include reducing the amount of information that is available, processing information to enhance its value and improving the information handling capabilities of an organisation by attending to its information infrastructure.

The outcomes of the study lend some credibility to the concept of information overload. In the experience of information use as information packaging one of the sources of frustration was both too much and too little information. In one situation the difficulty presented by too much information was linked to uncertainty about the validity of the information that was available and the credibility that could be attached to it. In another situation the difficulty was the reverse of information overload, that is information underload. The paucity of information stemmed from the organisation not having in place any processes or mechanism for collecting and disseminating relevant information. In these two situations it was the initial phase of the information packaging process, getting the information in, that was affected. Strategies for overcoming information overload that reflect those in the literature were suggested in the study. Firstly, information that is made available in either written or oral form could signify its importance or priority in some way. Secondly, clear guidelines for the gathering of information and the purpose for gathering it could be issued at the time that a request is made for information. Thirdly, a system or mechanism could be established for coordinating the collection of information that is presently not collected in the organisation.

In conclusion, although the outcomes of the study are generally supportive of the theme of information use in organisations as identified in the literatures of information science, organisation theory and management they also offer new insights into the dimensions and processes of information use. The outcomes reinforce the complexity of information use and the extent to which it is conceptualised by the work roles of the people using information but the conceptions of information use revealed in the study are more variable than the typologies of information use derived from the literature and applied in recent research. The typologies that rely on instrumental, conceptual and symbolic uses of information need to be questioned, if not challenged, in the light of the conceptions that have a basis in an empirical study. The literature suggested three interconnected dimensions that influenced information use in organisations. These three dimensions, related to information, the organisation and people, were reflected in the experiences of information use revealed in the study. The study's outcomes draw attention to these dimensions and the extent to which their influence is contingent upon the context of information use.

Managers' information use

The second theme that was drawn from the literature to shape the conceptual framework of the study was manager's use of information. The information science literature asserts that people's information use is influenced by their social and work roles as well as by their personal attributes. The view of information use presented in this literature is that information use is both an end state and a process. The organisation and management literature confirms that in information terms managers have a key role in organisations and that the nature of their work influences their information use.

Information in managers' roles

The model of managers' information use developed by Katzer and Fletcher (1992) proposes that managers are engaged in problematic situations that are continually unfolding and that these situations generate information behaviours including information use. Consistent with the person centred view of information behaviour, the problematic situations are defined by the people involved in them, but they are usually ill defined, messy, fluid and intertwined (Katzer and Fletcher 1992: 249).

Although the study did not explore managers' information use *per se* but rather managers' experience of information use the general thrust of Katzer and Fletcher's (1992) model is reflected in the study's outcomes, particularly in the new knowledge and insights, shaping judgements and decisions and influencing others conceptions. In these conceptions there is a sense of movement and of the messiness of the situations that necessitate information use. By contrast the experiences of information use in the information packaging and information flow conceptions are not characterised so much by movement as by a defined process with a clearly defined outcome, that is an information package or the exchange of information.

The literature of information science also reports studies of managers' information use that are reflected in the study's outcomes especially in relation to the social and cultural milieu of the information environment of organisations in which managers perform their roles. Browne (1992) identified different kinds of information use, extending the instrumental, conceptual and symbolic typology to include tactical and political uses of information. Although the typologies are themselves questionable from the viewpoint of a person centred approach to information use, Browne's study does confirm the political dimension of information use in organisations. In the study, the experience of information use, particularly in the new knowledge and insights and influencing others conceptions, were laden with the challenges of moving people forward in their thinking, building consensus by 'bringing people on board' and achieving changes in people's thinking and behaviour. The experience of information use in the information flow conception was also shown to be politically laden because of the capacity of people to withhold information and refuse to share it.

Information and managers

The interactions between managers and information lie at the core of information use and are surrounded by the context of work role and the environment of the organisation. The study was posited on an internal relation between people and information and so the interactions between information and managers are shaped by the characteristics of both information and managers.

Characteristics of information

The literature of information science draws a distinction between the quality of information sources and the quality of information in those sources, but the distinction is not always a sharp one. The credibility of sources and the reliability of information are two indicators of information quality highlighted in the literature although both might change over time. The meaning of information is fluid even when information is understood as an object.

Information richness is another indicator that is highlighted in the literature of organisation theory (Daft *et al.* 1987). As a notion used to explain the choice of media by managers information richness is reflected in the study's outcomes. The experience of information use in the information packaging conception relies on the development of an information object, ranging from an annual report to a training video. This lean medium is appropriate to communication that rests on clarity of purpose, similar frames of reference among the sender and the receiver and a situation with little ambiguity. Importantly in this conception there is also a clear sense of the audience that influences the 'look and feel' and linguistic style of the physical object when its format is not prescribed. In the information flow conception where the experience of information use can also involve oral communication the choice of communication style that matches the situation is an element of the experience. The information flow needs to be planned and managed so that communication is enhanced rather than impeded.

In situations that are characterised by ambiguity and different frames of reference among the participants the communication media need to be rich. Oral communication is the appropriate medium in these situations, a medium associated most clearly with the influencing others conception. The experience involved forums and large meetings addressed by the chief executive officer. These face to face meetings allowed the values and principles of the organisation to be articulated by senior managers and then reflected in the discussions that followed. The medium of oral communication in these situations assumed a symbolic status and reinforced the open culture of the organisation.

Characteristics of managers

The characteristics of managers that are pertinent to the conceptual framework of the study were drawn primarily from the literature of information science and supplemented where appropriate with literature on decision making in organisations and human information processing. The extent of the literature consulted was limited to the central focus of the study: that is, the experience of information use, or in other words the relation between people and information. Three threads relevant to information use emerged from the literature on human information processing. The first thread concerns time as a factor in information use, the second the role of intuition in cognition and the third the significance accorded the affective dimension in human information processing.

In the literature time has a number of different attributes. Associated with the quality of information, currency and accuracy are qualities attributed to time. Associated with the transmission to or exchange of information with others, timeliness and relevance are qualities attributed to time. Associated with organisational routines such as those requiring the development of some information packages, scheduling is a quality attributed to time (Wilson 1988). Associated with human information processing, speed of decision making (Eisenhardt 1990) is a quality of time.

In the study, the experience of shaping judgements and decisions required time for the verification of a judgement or decision as it unfolded. In the experience of information use as influencing others time was required so that evidence could be gathered, new ideas could be presented to others and people would be able to make choices about the new ideas. An attribute of time associated with human information processing that seems to be somewhat in conflict with speed in decision making is distance in time and space. In the study, this attribute emerged in the experience of information use as new knowledge and insights where time and space for reflection, thinking and learning were required so that conceptual shifts could occur.

The literature suggests that the dominant mode of decision making is essentially rational and linear. Although it might be the dominant mode one of the challenges to it accords intuition a role in decision making and cognition (Isenberg 1984; Agor 1986; Isenberg 1986). Intuition relies on previous experience of the decision maker as a way of making sense of new situations and testing alternatives. In the study, the experience of information use as new knowledge and insights relied in part on previous experience in developing new constructs. The experience of information use as shaping judgements and decisions also relied on previous experience and it was acknowledged that decision making was sometimes intuitive. The 'visceral judgement' identified by Rhyne (1985: 330) was part of the experience of information use.

The affective dimension of human information processing is well established in the literature of psychology (Forgas and George 2001). Although this dimension is now becoming more widely accepted in the information science literature (Kuhlthau 1993; Wai-yi 1998) its neglect in comparison to the dominance of the cognitive dimension in information behaviour is a cause for concern (Julien 1999). In the study all conceptions of information use included an affective dimension. The experience of information use as information packaging led to frustration when the audience was misjudged, as information flow the process assumed credibility and trust, as new knowledge and insights risks were taken and tenacity was required to construct knowledge, as shaping judgements and decisions values and self confidence were in evidence, and as influencing others commitment to the organisation and resilience in achieving its goals were a part of the experience of information use.

One of the key capabilities of managers in their work roles is information literacy. It has been assumed, at least in schooling, that this 'ability to recognise information needs and to identify, evaluate and use information effectively' (Bruce 1999b: 33) relies on one process, an assumption confirmed in a study of information literacy in the workplace (Wai-yi 1998). Although the information literacy process might not be identical in both schooling and the workplace there is an assumption that a single process meets the information literacy needs of people in each of these settings.

In the study, the variation in the experience of information use that denotes each of the five conceptions suggested that the capabilities required for identifying, evaluating and using information effectively also vary. Rather than one process there are five different processes embedded in each of the conceptions. It is the information packaging process that most closely resembled the information literacy process used in schooling. It is the process embedded in the information flow conception and the new knowledge and insights conception that most closely resembled the process outlined by Wai-yi (1998); Cheuk 2000).

In conclusion, the study has confirmed the contingent nature of information use, it has questioned the usefulness of the typologies that have been developed to date to model information use in organisations and it has asserted the significance of the affective dimension in information use. The next section of the Chapter outlines the contribution of the study to the concept of information use, a concept central to information behaviour and information science. In this section the focus moves from the empirical study to the thesis as a whole.

Information use

The theoretical location of the thesis is primarily in the field of information science although it has been informed also by the literature of information utilisation. Different perspectives on information and information use and several typologies of information use emerged from these literatures and the factors that facilitate information use were identified. The outcomes of the study offer another perspective on information and information use and provide an alternative typology of information use to those discussed in the literature.

Perspectives on information

The strength of the study is that its outcomes reveal qualitative variation in the participating managers' experiences of the phenomenon of information use. The five conceptions of information use that were revealed in the study point to the complexity of the concept of information use and more significantly, to the variation in the relation between people and information. Although theorists and researchers in information science have grappled with different definitions of the term 'information' none of them has taken a person centred perspective in deriving their definitions. Debons *et al's* (1988) continuum spanning data to wisdom rests on a hierarchy of information processing and Buckland's (1991) categories rely on English language usage as captured in a reputable dictionary. In the field of policy making, Braman's (1989) definitions are set in the context of social organisation.

The traditional and alternative paradigms in information science (Dervin and Nilan 1986) centre on different perspectives on information: an objective view in which information is conceived as an object likened to a brick and a subjective view in which information is conceived as a construct created by a person using information. More recently, an extension to the subjective view has been suggested by Bruce (1997b).

Central to the referential and structural dimensions of each of the conceptions of information use that emerged from the study is subject-object relation, that is the relation between people and information. It is this relation that Bates (1999) has highlighted for more attention by information science researchers. Three different relations between people, or at least the participating managers, and information were discerned. These relations reflect variation in the ways in which information is understood by people. They are summarised in Table 14 that follows.

Table 14:

Variations in the ways in which information is understood

Understanding of information	Category of description
objective and in a context external to the person in the external environment	Category one: information packaging Category two: information flow
subjective construct internal to the individual meaning attributed by individual	Category three: new knowledge and insights
transformative force values embedded in information can be transformed can transform people	Category four: shaping judgements and decisions Category five: influencing others

Based on Bruce (1997: 115)

These variations in ways in which information is understood reflect some of the literature in information science and policy making. The hierarchical continua of Debons *et al* (1988) and Braman (1989) are evident especially in the transformational view of information. The view signifies the importance of the social and cultural foundations of information and although these foundations have been acknowledged by information scientists interested in information behaviour it is only recently that they have captured the attention of information scientists interested in information retrieval and information systems design. The ontological and epistemological assumptions that underlie a transformational view of information, and of phenomenography as a research approach, are similar to those that underpin Dervin and Nilan's (1986) alternate paradigm. While data and information are well understood in information science, knowledge and wisdom are less so or at least less frequently explored empirically.

The study has revealed not only variation in the ways that information is understood by people but it has also revealed a hierarchy of understandings. This hierarchy has adopted a consistent viewpoint: that is, from people actually experiencing information use. Moreover the study has revealed the multiple meanings that people attribute to 'information' although the researcher used only the term 'information' and the terms 'knowledge' and 'wisdom' were used infrequently by the participating managers in the study.

Perspectives on information use

As a subset of information behaviour, information use shares the complexities of information behaviour more generally. The categories of description and the outcome space that represent the totality of information use as experienced by the participating managers suggest that as a human behaviour, information use encompasses physical, cognitive and affective dimensions. Some conceptions feature a physical dimension more than others. For example, physical activity is clearly evident in the experience of information use as information packaging but less so in the experience of information use as developing new knowledge and insights. Other conceptions feature a cognitive dimension more than others, with the experience of developing new knowledge and insights involving mainly cognition. Yet other conceptions feature an affective dimension with the experience of information use as influencing others making greater affective demands on people when compared to the experience of information use as information packaging. It must be acknowledged that no one conception draws on only one of the three dimensions of human behaviour but rather that the physical, cognitive and affective dimension is more to the fore in some conceptions as compared to others. This again is part of the variation in the experience of information use. Information use is also shaped by the context in which it is experienced and this is evident in the five conceptions. The context resembles the structure of awareness in each of the five conceptions. While the focal awareness in all conceptions is information understood in various ways, the foreground varies from the activity in which the manager is engaged, as in the information packaging conception, to the organisation, as in the influencing others conception.

The experiences of information use as revealed in the conceptions suggest that information use is both an end state and a process. The information packaging and information flow conceptions reveal an end state that takes the form of an information package or a tangible contribution to information flow. As an end state information use is experienced very much in the present. The shaping judgements and decisions and influencing others conceptions reveal an ongoing process of change involving interactions between people and information. As a process, information use has a forward looking orientation. This view of information use as both an end-state and a process reinforces Todd's (1999a; Todd 1999b) conclusion that information use can be seen as both an end-state and a process, depending on the perspectives on information that are adopted.

Typologies of information use

Typologies of information use that have been developed were found to offer little direction to the thesis. In one sense, the outcome space consisting of the logical relationships among the five conceptions that reveal the variation in the experience of information use can be regarded as a typology in its own right, although it is limited perhaps to the experiences of information use in a specific setting by specific people. Although initially the typologies developed on the basis of social science information use (Pelz 1978), the utilisation of research (Weiss 1979), Sense-Making (Dervin 1992; Savolainen 2000, Taylor 1991), information use as a cognitive process (Todd 1999a;

Todd 1999b) and information seeking and use (Limberg 1999) appeared to reflect ways in which information use might be understood, no single one of these typologies reflects the totality of experiences of information use as revealed in the study's outcomes.

The typologies were developed in different ways, not all of them from the viewpoint of people as users of information. The typologies developed from social science information use and the utilisation of research foreshadowed the different ways in which information use can be seen, although Weiss's (1979) typology admits more variation than might be expected. So too does Taylor's (1991) typology and the theme of movement in space-time that is fundamental to Sense-Making resonates with the forward looking orientation of the developing new knowledge and insights, shaping judgements and decisions and influencing others conceptions. The cognitive process and information seeking and use typologies present the viewpoints of people as information users but their focus is limited to the information packaging and new knowledge and insights conceptions.

In terms of a holistic view of information use the outcome space reveals the variation in the collective experiences of information use. For this reason the outcome space offers a consistency of viewpoint that is not achieved in the typologies particularly those that are based on several studies. The outcome space also draws on a range of experiences of information use although it is limited to experiences in a particular setting; that is, two organisations in the cultural industries sector. Some of the typologies are also based on a particular setting and situation, such as a school (Limberg 1999), a defined topic (Todd 1999a; Todd 1999b) or everyday living (Savolainen 2000), but the scope of information use is more limited than that revealed in the study of managers' experiences of information use.

Factors facilitating information use

Three sets of factors that facilitate information use were identified in the literatures of information science and information utilisation. These factors relate to information, to the context in which information is used and to the capabilities of people who use information. Although these factors were not addressed explicitly in the study their function in facilitating information use is apparent in the categories of description that denote each of the five conceptions of information use.

The information domain

These factors concern the quality and value of information used by people. Not only does the nature of information vary in the conceptions but so too does the set of criteria used by people for determining the quality of information they use. The criterion of trustworthiness appears to be consistent throughout the categories of description although more important in some categories than in others. Timeliness is another criterion that emerged along with accuracy. In one of the categories, the verification of information was part of the process used by people. The criteria for determining the quality of information appear to be dependent on the situation in which information is used and the purpose for which it is used.

Evidence in support of Saracevic's (1986) and Taylor's (1986) models for adding value to information emerged from the study. These models seek to enhance the physical and intellectual accessibility of information. Information consolidation (Saracevic 1986) involves the repackaging of information so that it is available and people can more readily grasp its significance and meaning. Value added processes (Taylor 1986) have a similar purpose and are designed to enhance the retrieval of information from information systems. In the study not only was information sometimes not able to be retrieved it was not even available in some situations. At other times the significance of information was overlooked with negative consequences for the people wanting and needing to use it. All five conceptions of information use assume the availability and accessibility of information, although the immediacy of these values seems to be more critical to the conceptions that rely on information as an object: the information packaging and information flow conceptions.

The contextual domain

These factors are derived from the work of Backer (1993) in the field of information utilisation and are concerned with both individual and organisational change, especially in the area of innovation and the diffusion of new ideas. In his model Backer (1993: 219-220) identified six strategies for enhancing information utilisation. Three strategies relate to planning the adoption of the innovation and three to creating the environment for change required for its adoption. In terms of information use, the first set of strategies draws on a forward looking orientation and the transformation of information about the innovation, and the second set on social and cultural factors in the environment.

These factors emerge in those conceptions that rely on information as a subjective construct and as a transformative force. In these three conceptions, developing new knowledge and insights, shaping judgements and decisions and influencing others, change is a significant element. In the categories of description of these conceptions, interpersonal interactions and communication appear as significant elements in fostering the changes that need to occur, both in the thinking of individuals bringing about change or in the people who are involved in the environment where new ways of thinking and understanding as well as new ways of doing things and behaving are being introduced.

The human factors domain

Information literacy is regarded as a key capability for using information. With its origins in education and schooling information literacy has traditionally focussed on the preparation and presentation of assignments for the purposes of evaluating student learning (Behrens 1990; Behrens 1994). Influenced by the application of information literacy to workplaces there is now theoretical interest in broadening the focus to include the creation of knowledge (Mutch 1997). There has also been some empirical interest in exploring information literacy in the workplace. Wai-yi's (1998) study of auditors demonstrated that the information process underpinning information literacy is cyclical and unpredictable and that people as information users are both suppliers and consumers of information. The articulation of a theory to underpin information literacy is still in its very early stages (Bruce 1999a; Bruce 2000; Mutch 1999; Mutch 2000; Todd 2000).

The conceptions that have emerged from the study offer the basis of a theory of information literacy grounded in the experience of information use in the work place. With the variation of ways of understanding information that is integral to the outcome space and the logical relation among the conceptions it can be argued that there is not one all encompassing information literacy but that rather there are several information literacies that rely on different capabilities in using information. One of these might focus on information packaging with its clearly defined process of evaluating and selecting information and presenting it to an audience for a particular purpose. Another might focus on developing new knowledge and insights by using information to move into the realm of the unknown and in the process create new knowledge. Yet another might focus on shaping judgements and decisions by aligning information with principles and values to arrive at new understandings. These suggested information literacies call on capabilities that are pertinent to the different ways in which information itself is understood.

As a point of departure from approaches to information literacy that focus on individuals the conceptions suggest that it is possible to entertain the notion of information literacies at the level of the organisation and to speculate on the different capabilities in using information that are required. The conceptions suggest three information literacies oriented more towards the organisation than the individual. One might focus on information flow that is dependent on open channels of communication and opportunities for people to share information with each other in the workplace. Another might focus on developing new knowledge and insights within the confines of the organisation's goals. Yet another might focus on influencing others to align their judgements and behaviours with the organisation. Some of the capabilities required of organisations are related to information culture and communication strategies. Other capabilities are related to the organisation's ethos, its tolerance of divergent views and approach to risk management. Yet other capabilities have a strong ethical component primarily focussed on the relative balance between the organisation as a collective and the individuals and work groups that constitute it.

In conclusion the study and the thesis refine and deepen the understanding of information and information use. The study suggests that the attention given to the objective and subjective views of information needs to be broadened to include transformative views of information. To this extent the outcomes of the study build on the empirical work of Bruce (1997a) and the theoretical work of Braman (1989). The study reveals that information use has a complexity and a richness that have been overlooked in much of the theoretical literature in information use and information utilisation. The picture of information use that is offered by the study is consistently people-centred. The response to the remaining question that shaped the study: How do senior managers actually use information? indicates there are qualitatively different experiences of information use that reveal different relations between people and information.

Implications of the study

The implications of the study and the thesis are two-fold. There are implications for further research in the area of information use and there are implications for information practice, some of which might be directed towards managers and others towards information professionals in organisations. These implications serve to reinforce the significance and value of the study.

Implications for information research

With its focus on information use the thesis redresses to some extent the neglect of information use in information behaviour research. Although an explanation has been offered for this neglect, recent developments in methodology promise a heightened level of interest in information use research. There are implications for both research methodologies and research directions that emerge from the study and the thesis.

The study is based on phenomenography as the research approach. Although this approach has been used in few studies of information behaviour (Bruce 1997a; Limberg 2000a; Limberg 2000b) its methodology is congruent with studies that assume a relation between people and their information worlds and between information and people. There is then scope for using phenomenography as the research approach in studies of information behaviour. The limitation of phenomenography, shared with interpretive approaches generally, lies in the application of research outcomes beyond the setting, environment, situations and people studied but this limitation is overcome to the extent that the outcomes emerge from a collective pool of experiences of a phenomenon rather than from summation of individuals responses. Phenomenography is also concerned with variation in human experience, a concern that is consistent with the contingent nature of information behaviour.

The study and the thesis suggest different research directions that might be followed in the area of information use. One direction could involve the exploration of information use by people in different roles in an organisation, for example middle managers, supervisors and those with no supervisory roles. Such an exploration could also focus on people in different functional areas in an organisation, for example in human resources, programs germane to the organisation, publications and corporate services.

Another direction might be the exploration of information use in different settings, for example small and medium size organisations, start up and spin off companies, community organisations and volunteer groups and also in different industry sectors, for example the media and entertainment sector, the rural and regional sector, agricultural industries, medical and health services, the creative and performing arts sector and the information technology industry. Yet another direction could be information use by different categories of workers, for example professionals, technical staff and tradespeople. Still another direction might be the relation between people and information that is most appropriately supported by information and communication technologies and systems.

In terms of information behaviour a direction for further research is the relationship among information use and other concepts related to information behaviour. The concepts of information need, information seeking and information use are often presented as a cyclical three phase model of information behaviour but the boundaries between the phases remain fuzzy. The patterns of movement through these phases could be explored as a way of further clarifying these three concepts.

A final direction for research that extends from the study and this thesis is ongoing research in information literacy, especially in settings beyond the school and other education institutions, and encompassing different perspectives on information. In light of the richness of information use that is supported by this thesis, there is the likelihood that information literacy is an equally rich concept and one deserving sustained study.

Implications for information practice

The implications for information practice can be directed towards organisations and information practitioners. Because the environment of the study was organisations some of the strategies that emerge from the study are potentially useful for those organisations keen to exploit the full range of information resources available to them. Some of the strategies will be directed towards fostering a structure and a culture that supports the flow of information in ways that support people and enable them to enact their organisational roles. Other strategies will be directed towards the presentation of information and will consider the medium of presentation, the timing of presentation and the purpose that is to be achieved. Yet other strategies might address people's information capabilities. The value of the study and the thesis is that they offer strategies for integrating information and knowledge into organisational processes. From the thesis it is clear that a multi-facetted approach is appropriate and that recognition needs to be given to the information, organisational and human factors that are involved.

Information services offered by information practitioners in organisations have focussed on information provision of the kind suggested in the information packaging and information flow conceptions. In other words the focus has been on the provision of information as an object. Information practitioners are highly skilled in managing information and its packages. They also have the capabilities that are involved in the packaging and repackaging of information but it is possible that not all organisations recognise these capabilities and include information practitioners in teams and groups responsible for an organisation's internal and external publications. Information practitioners are also capable of managing and tracking some of an organisation's formal information flows as well as creating opportunities for informal information flow. Current awareness and selective dissemination services offer a basis for involving information practitioners in information flow in organisations.

The new knowledge and insights conception presents opportunities for information practitioners to extend their practice and engage in the construction of new knowledge in organisations. With the interest in knowledge management this engagement would appear to be feasible provided that information practitioners have the appropriate capabilities. Some of the capabilities demand high level interpersonal skills, working knowledge of the organisation's goals and strategies, perhaps business or discipline specific knowledge as well as business intelligence and knowledge of information sources. Engagement in knowledge creation in organisations would require information practitioners to assume roles as gatekeepers and as information counsellors working closely with teams engaged in the business of the organisation.

Roles for information practitioners that are unique to the shaping of judgements and decisions and influencing others are more likely to emerge as the value of the capabilities of information practitioners to their organisations becomes acknowledged more widely. It is likely that any role would develop from that of an information or knowledge counsellor but in any event the role is likely to build on information practitioners' capabilities in managing information as an object, that is in packaging information and contributing to information flow, as well as supporting the development and dissemination of new knowledge and insights. Managing information as a transformative force represents a challenge to information practitioners as they shift their focus from managing information, information resources and information processes to managing the information ecology and environment of organisations. Although knowledge management remains a contested area of professional practice it is clear that information practitioners who manage information as a transformative force have at least a partial claim to this area.

Clearly information practitioners have a role in developing the information capabilities of an organisation. The five conceptions of information use offer some directions for the enhancement of information capabilities of people in organisations and they also provide some direction for the tailoring of development programs to meet the needs of people. This does not suggest that the development of information capabilities is the sole responsibility of information practitioners in organisations. Information practitioners would also be supported in this organisation wide function by senior management and lead a group of people planning and delivering an information capability program based on different information literacies.

Finally there are implications for the education of managers and information practitioners in organisations. Because information capabilities are critical to the capacity of an organisation to exploit information and knowledge, managers need to be skilled information users. Not only should their information capabilities be addressed in formal courses but also in continuing professional development programs. Information practitioners need to be fully aware of the complexity of information use so that they design and deliver appropriate information products and services to people in organisations. Programs of study designed for information practitioners need to provide opportunities for their students to develop appropriate personal, technical and professional skills.

Appendix 1

Glossary

Categories of description: These denote conceptions or ways of experiencing a phenomenon and should not be confused with conceptions. Categories of description are characteristics of conceptions. In a phenomenographic study, conceptions emerge from people and categories of descriptions are constructed. The structural and referential dimensions of a conception are dialectally intertwined.

Conceptions: A conception is a way of experiencing or understanding a phenomenon such as information use. Conceptions are not the phenomenon itself but aspects of it as seen from the perspectives of those who have experienced the phenomenon.

Information: Because people's perspectives on information are significant to the thesis and the empirical study, a prescribed definition was inappropriate. For the purpose of the study, data, information, knowledge and wisdom were all acceptable as signifiers of 'information'.

Information use: A prescribed definition of information use was seen as inappropriate to the study. Information use, information utilisation and use of information were all regarded as acceptable signifiers of information use by the researcher to denote qualitatively different ways a phenomenon is experienced.

Outcome space: In the same way that the categories of description denote conceptions, so the outcome space denotes a phenomenon. The outcome space represents a phenomenon or an aspect of reality as it is understood and experienced by people.

Phenomenon: A phenomenon is an aspect of reality.

Referential dimension: This term refers to the meaning structure of a conception or the meanings that are attributed to what is experienced by those who experience it. This dimension is the 'what' aspect of a conception.

Structural dimension: This dimension refers to the 'how' aspect of a conception or the way that it is experienced. It is concerned with the focus of awareness as a phenomenon is experienced.

Appendix 2

Transcriber Agreement

Faculty of Humanities and Social Sciences
Joyce.Kirk@uts.edu.au

CONFIDENTIALITY AGREEMENT

I have agreed to transcribe audiotapes of interviews for the project, Managers' Use of Information. This project is being conducted Joyce Kirk who is an enrolled student in a PhD program at the University of Technology, Sydney. The Principal Supervisor of the project is Professor Mairéad Browne.

I agree to the following undertakings and conditions of ethical research practice as they relate to transcribing audiotapes of interviews with Joyce Kirk:

1. I undertake to protect the privacy of those people whose records of interview I am transcribing.
2. I undertake to maintain the confidentiality of the substance of the interviews.
3. I undertake to use pseudonyms in the transcripts to identify people and organisations. Joyce Kirk has devised these pseudonyms.
4. I undertake to reveal the identities of the people and organisations named in the audiotaped interviews only if required to do so by law.

I understand that the UTS Research Ethics Committee has approved these undertakings and conditions.

Signed by Date

Witnessed by Date

Appendix 3

Correspondence with participants

24 November 1999

Name
Address

Research Project: Managers' Use of Information

I would like to thank you very much for agreeing to participate in a project which I am conducting as one of the requirements of the PhD program in which I am enrolled. Because of my professional experience in management and my studies in information science, I am carrying out research into managers' experience of information use in their work. The outcomes of the project should have implications for the design of information services for managers and the development of information systems such as management executive information systems.

The research involves interviews with a number of managers from your own and other organisations, documents provided by each manager and observations made by me at each manager's workplace while carrying out the interviews. Each interview will take about seventy-five minutes.

I would like to emphasise your rights as a participant in the project. They are

- the right to protection of your privacy and the confidentiality of the information you provide
- the right to withdraw from the project at any time without giving any reason
- the right to withhold information
- the right of access to information that you provide
- the right to be fully informed at all stages about the project and your involvement in it
- the right to review the transcript of the interview should you agree to have it taped.

I have taken a number of steps to ensure that these rights are observed. These include

- protecting your identity within the organisation. I am not able to reveal which managers participate in the project nor to provide access by the State Library to information that an individual manager provides.
- using codes for the names of managers and their organisations. Only I will have access to the names and codes. Code names will be used in the thesis written on the basis of this project and in any papers or presentations that follow.
- securing the confidentiality of the information you provide. Written transcripts of audiotapes of the interviews will identify you by your initials only. The transcriber will use the initials that I provide and will sign a confidentiality agreement with me. Any documents which you provide and my records of any observations will use a code to identify their origins. The audiotapes, documents and observation records will be stored securely in my study while the project is in progress and move to secure storage at UTS on its completion.
- obtaining your agreement to participate. You might like to sign the consent form that is attached at the commencement of the interview.
- offering you choices about whether to provide information in the interviews and any documents.
- limiting access to the information you provide. Only you as the participant and I as the researcher will have access to the information that you provide except in the circumstance that it is subpoenaed. The information will be organised and indexed to ensure ease of access.
- being fully informed about the project and what it involves for you. I have included details of the purpose of the project and your involvement in it in this letter
- offering you the choice of reviewing the written transcript of the interview to check any errors of fact should you agree to the interview being taped.

If you would like any further information on the project please contact me by phone on or by e-mail at Joyce.Kirk@uts.edu.au.

I appreciate your willingness to contribute to the project and to set aside time for the interview. I look forward to speaking with you in your office on Tuesday November 30, 1999 at 10.30am.

Yours sincerely,

Joyce Kirk

UNIVERSITY OF TECHNOLOGY, SYDNEY

MANAGERS' USE OF INFORMATION

Information is recognised increasingly in organisations as a strategic asset. The level of investment in information resources and technologies is one measure of the importance of information. Another is the design of business processes that rely on collaboration and information sharing across organisational units. Yet another measure is the development of learning organisations characterised by the creation and transfer of knowledge. Still another is the emerging practice of knowledge management in organisations. Information has the potential to underpin the competitiveness and sustainability of organisations as they initiate and respond to developments in their external and internal environments.

What is the aim of the research project? Popular commentators and academic researchers acknowledge that the roles and functions of managers are information-intensive. Yet there is evidence that the services and tools intended to support managers in their work roles have been under-utilised. For example, the promise of improved organisational performance offered by services such as corporate libraries, technologies such as executive information systems, and tools such as databases have not been always realised. Some argue that managers face problems of information overload, others claim they face a scarcity of useful information.

Why is this so? There are suggestions that people's understandings of a phenomenon shape the meanings they make of it and their behaviour towards it. The way that managers understand information use would seem to be a useful starting point for the development of services, systems and tools designed to support managers in their use of information in their organisations. The project seeks to identify and explain the ways in which managers use information.

It is the intention of the project to explore information use in data provided by managers participating in the study and and by an analysis of the empirical research and seminal writing in information science. Because of its design and methodology the project is located in the field of naturalistic inquiry and draws on interview and content analysis techniques to provide qualitative data.

Why is the project important? The outcomes of the project could be significant for a number of reasons. They should contribute to

- knowledge of information use, an area in information which has not received much attention from researchers over the past ten years or so
- research design in information science through the use of a methodology, phenomenography, that has its recent origins in learning research
- information practice through the use of protocols for information services and products based on managers' experiences of information
- management practice through the insights into the ways information is used in organisations.

How can [your organisation] assist the project? The inclusion of a leading cultural institution as a research site in the project will add to the diversity of organisations from which the research participants are drawn. This diversity and richness is a key element in ensuring the trustworthiness of the project. The [organisation] can assist the project by agreeing to provide access by the researcher to managers who volunteer to participate in the project and to documents that the managers see as relevant to the project.

The managers approached to participate in the project would have responsibilities that include the implementation of corporate policies or plans developed by or with managers at the [organisation]. They would be in positions that link the activities of vertically related groups or teams and report to either the [Chief Executive Officer] or a senior manager and have others reporting to them.

The UTS Research Ethics Committee has approved the project. Some of the conditions of its conduct are that

- participation by managers at all stages in the project is voluntary
- consent forms have been prepared for signing by the managers
- provision has been made for each manager to check the interview transcript

- steps have been taken to ensure the confidentiality of the [organisation] and the participants as well as the anonymity of the reports of the interviews.

Within these limits, an aggregated summary of the data from the participating managers will be provided to [the employing organisation].

How many managers might be involved and what will be asked of them? On the basis of previous grounded theory research, six to eight managers from [your organisation] will need to be interviewed. Each manager will be asked by the researcher to outline two situations and to describe aspects of their information use in those situations. One of these situations should contribute to the organisation's achievement of its goals. The interview should take about an hour and if possible it should be carried out in each manager's office. It is the situations described by the managers rather than the managers themselves that are the units of analysis in the research.

For further information please contact:

Joyce Kirk
Faculty of Humanities and Social Sciences
University of Technology, Sydney
PO Box 123
Broadway 2007
E-mail: Joyce.Kirk@uts.edu.au

CONSENT FORM

I agree to participate in the research project, Managers' Use of Information, being conducted by Joyce Kirk who is a PhD student in the Faculty of Humanities and Social Sciences at the University of Technology, Sydney. I understand that the purpose of the study is to explore manager's experience of information use in their work.

I understand that my participation in this research will involve me in discussing some work situations with Joyce Kirk and reflecting on my use of information in that context. There will be one interview each of approximately 75 minutes in length. I understand that I can agree or decline to have the interview taped. I may be asked to provide supplementary information about the organisation that employs me and my responsibilities as a manager. While Joyce Kirk is at my workplace for the interviews she will carry out brief observations relevant to the project.

I agree that the research data gathered from this project will be used in the writing of a thesis and may be published or presented in a form that does not identify me or the organisation that employs me.

I understand that I am free to withhold any information and to withdraw from this research project at any time without giving a reason. I will have access to the information that I have provided.

I agree that Joyce Kirk has answered my questions fully and clearly.

I understand that I am at liberty to contact the supervisor of the student's project, Professor Mairéad Browne, on 95141334 if I have any concerns about the research project.

Name

Signed prior to the interview by Date

Witnessed by Date

This study has been approved by the University of Technology, Sydney Human Research Ethics Committee. If you have any complaints or reservations about any aspect of your participation in this research you may contact the Ethics Committee through the Research Ethics Officer, Ms Susanna Davis on 95141279. Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome.

5 March 2000

Name
Address

Research Project: Managers' Use of Information

Dear

Thank you very much for returning the transcript. I have made the corrections that you suggested and I am now in the process of analysing our conversation in terms of your experiences of information use.

I would like to thank you very much for both the time and the thoughtful insights that you shared with me. I realise that you have many demands on your time so I appreciate very much your contribution to the project.

Yours sincerely

Joyce Kirk

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