TOWARDS A MODEL OF INFORMATION BEHAVIOUR OF AN INFORMATION PROVIDER: A MIXED METHODS STUDY

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Abstract

Not much is not known about the totality of information behaviours of information providers from among the plethora of library and information science literature. This research aims to describe, categorise and devise a representation of information workers' experiences as they engage in information behaviours in a health information provider organisation in Scotland. The organisation is a typical example of an information services provider where decision makers constantly strive to improve the quality of their information outputs by attempting to understand the information behaviours of their employees and respond to changes in the external information environment. A model of information behaviour becomes a useful tool for understanding what goes on within the information provider organisation.

With pragmatism as its philosophical tether, the qualitatively-driven sequential mixed methods study uses critical incident interviewing within Heideggerian phenomenology and then a questionnaire survey to capture value-adding information behaviours, feeling states as outcomes of information behaviour, and perceptions of internal impact of information behaviour. The research subjects are invited to participate in a respondent validation workshop where a model of provider information behaviour is co-created.

The findings reveal 3 core information behaviour types (information acquisition behaviour, information production behaviour and information dissemination behaviour) and 2 associated information behaviour types (multitasking and collaborative information behaviours) in a non-linear relationship. Several positive and negative feelings are identified together with information workers' perceptions of how their information behaviours impact on the internal information environment of their organisation. The core and associated information behaviours are further categorised and their subtypes are validated on returning to the research participants.

Recommendations for practice and further research include introducing Web 2.0 technologies in the provider organisation to enhance information dissemination, reviewing the value of some information activities in the provider organisation, investigating the mechanism of the information behaviour trigger, and further research on the role of feelings and individual characteristics before and after information interactions. The findings provide insights of information interactions of an information provider that make a significant contribution to LIS knowledge.

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ACRONYMS

CI	Competitive intelligence
CIB	Collaborative information behaviour
CIR	Collaborative information retrieval
CVI	Content validity index
I-CVI	Item content validity index
IIB	Individual information behaviour
IRP	Information request protocol
ISD	Information Services Division of the Scottish National Health Service
LIS	Library and Information Science
MMR	Mixed methods research
S-CVI	Scale content validity index

CHAPTER 1: Setting the Scene

1.1 Introduction

Information services providers constantly look for ways to improve the quality of their information products and services. To do this, decision makers in information provider organisations have to rise to the challenge of developing more effective information services through better understanding of what goes on within their organisation. Nowhere is this more critical than in health information services provision where an understanding of information behaviours is essential for supporting appropriate decision making and producing information outputs that can have a direct impact on the wellbeing of patients.

The Scottish National Health Service continually evolves in order to respond to the changing ways in which health care is delivered. At the same time, there is an increasing drive towards ensuring the delivery of safe and high quality care while balancing these with cost efficiencies and smarter ways of delivering care. To meet the requirements of change programmes and developments, there is an increasing requirement for health information services to provide information that customers, such as policy makers, health care providers, patients, the media and a range of interest groups, perceive as high value and quality.

Scotland's only national statistics and information services organisation provides health information, health intelligence, statistical advice and support for its numerous stakeholders and customers who require robust information for complying with the change and quality agenda, engaging in care and business planning, and making decisions related to patient care, research, media headlining, fraud investigation and health sector expenditure monitoring. The national organisation, Information Services Division of the NHS Scotland (ISD), employs information workers who engage in a series of complex information behaviours by working closely within teams and projects, and also with their customers to ensure that customers' information requirements are met and that ISD remains relevant and responsive to internal and external change. An understanding of what goes on within ISD can contribute to the decision making processes involved in introducing change in ISD's internal environment and therefore help it cope with change that occurs in the external environment.

However, not much is known about the information behaviours of information providers, particularly the information behaviours that information professionals engage in when once information is sought and found. In addition, not much is known about how the information behaviours of an information provider may impact the internal environment of

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the provider organisation. Yet still, not much is known about the experiences of the information professionals as they interact with information and engage in value-added information behaviours that result in an information product or service that meets customers' expectations.

This study sets out to provide insights of information behaviour of an information provider by exploring the experiences of information workers in ISD as they interact with information. It assumes that the information provider is also an information user and that, when the information workers in ISD interact with information and engage in different types of information behaviour, the information gathers value along its information journey within the organisation. This value-adding journey results in a product or service that meets the information needs of the information consumer.

Representing information behaviour by means of models has been an area that has proved a challenge to information behaviour scholars over the years. Most scholars have developed models based on the information seeking mode of information behaviour whereas a handful, such as Wilson (1997, 1999a, 1999b), have gone on to develop more general models of information behaviour incorporating not only information need and information seeking, but also aspects of information processing and the subsequent application of information, while drawing from the disciplines of sociology (social learning theory and demographics), economics (costs and time spent seeking), psychology (personality, affect, cognitions) and organisational decision-making. Niedźwiedzka (2003) also developed a general model of information behaviour with an emphasis on information seeking and concluded that it was far from being a comprehensive model because it lacked details of information encountering, information acquisition and stages of decision making. Spink, Park and Cole (2006) presented an integrated human behaviour framework which focussed on multitasking and information seeking behaviours and they stated that further studies for enhancing an understanding of impact of information behaviour was necessary. Most of these models and theories by LIS scholars have either been developed with reference to the user of information as a recipient of information, rather than a provider of information, or have focussed specifically on information seeking behaviour.

Wilson (1981) argued that relationships exist between emotions and information behaviour and, 30 years later, Albright (2011) presented arguments in support of her assertion that the field of psychology, particularly in the areas of affect and emotions, offers opportunities for psychodynamic theories to further our understanding of information behaviour. The range of information behaviours in ISD, together with other human experiences such as feelings and perceptions, depicted in a model, may help us

to better understand the relationship between people and information in this health information provider sector, provide evidence for better managing information services particularly during periods of change, and make an original contribution to the discipline of library and information science.

Hepworth (2007) conceptualised the relevance of information behaviour in the design of information services and products. He argued that this relevance is, in part, attributed to the increasing value being placed on data, information and knowledge and the desire to meet the increasing needs of the information consumer. This argument resonates well with this study which focuses on ISD, a provider of value-added health information and statistical services to its internal and external information consumers.

This study is paradigmatically orientated towards pragmatism which is further described and rationalised in chapter 4. Pragmatism allows enough flexibility for ensuring that the right combination of methods is used for answering the research questions which are presented in chapter 3.

This introductory section has highlighted the key elements of what this study is about and why it is so important to model information behaviour in ISD. The statement of the problem is discussed in greater depth in section 1.2. This is followed by subsequent sections on the key operating definitions, aim and scope of research, and ending with the theoretical framework and description of the structure of subsequent chapters of the thesis.

1.2 Motivation and Statement of the Problem

Although several models of information behaviour exist, there is still a gap in the literature because much is not known about information interactions beyond the information seeking stage in information provider organisations. There is also a gap in the literature on LIS impact studies related to information behaviour in that no study has been found to address individuals' perceptions of impact of information behaviour which is a subjective indicator of cognitive processes that individuals would experience as they engage in information behaviours. There are, however, many studies on impact of services and impact of information.   No model of information behaviour of an information provider has been found in the search for literature which captures the internal information interactions of an information provider in such a way as to provide insights into information behaviour categories, experiences of feelings and emotions, and perceived impact of information behaviour. Also, no model of information behaviour of a health information services provider has been encountered in literature searches. The present study attempts to

reduce this gap in the literature. Information behaviour models are useful as they herald the emergence of formal theory (Case 2007), provide insights for informing better management decision making, and add to LIS knowledge base. Hunsicker (2001) posits that understanding formal and informal information flow including people and their behaviour is essential for good leadership and astute management.

Information workers within information services provider organisations such as libraries, information agencies, and data and statistical services provide services for the information consumers who access their services in response to their individual need. LIS research literature comprises a vast array of studies and models of information behaviour that are mostly based on users who are recipients (or consumers) of information, rather than providers of information. In the context of the present study, in which the information provider is a health information provider organisation, the recipients of information who are not employees of ISD are referred to as external users.

Having read widely within LIS and interacted with different types of information practitioners, the researcher came to the conclusion that LIS literature not only focuses mostly on external users, but there is a tendency for research articles to focus predominantly on information seeking behaviour to the exclusion of other types of information behaviour. Also, where decisions were being made that would impact on information practitioners, there was not enough consideration of the information activities of the information practitioners and how the decisions would impact on their information activities and, consequently, on the service or product provided. The literature supports these personal observations. Bao and Bouthillier (2007) argue that LIS studies on information behaviour focus more on the information consumers and their information needs rather than the information provider and their information behaviours. Nevertheless, there exist a few LIS and related studies on information providers that investigate a range of information behaviours. Examples are Brown and Ortega's (2005) study of the information seeking behaviour of physical science librarians, some studies of information seeking behaviour of journalists and reporters (Fabritus's 1998, Chinn 2001, Mahapatra and Panda's 2001), Millen and Dray's (2000) study of information sharing among journalists, Diso's (2005) research on journalists' role in information production, transfer and delivery, and Rose's (2006) study of the information activity of rail passenger information staff. However, what is missing is a model that brings together the different types of information behaviour of an information services provider that depict the flow of information through the provider organisation as value is being added to the information and as the information workers experience feelings and emotions as articulated by Albright (2011), Baumeister et al (2007a) and Nahl (2001). The current models of information behaviour are inadequate for describing and understanding information

behaviour of information providers with regard to their information interactions, emotional outcomes and perceptions which should be key considerations in the management of information provider organisations.

Scholars such as Bouthillier et al (2003), Bouthillier and Jin (2005) and Jin and Bouthillier (2004, 2007, 2008) have studied the information behaviours of competitive intelligence professionals, a type of information provider that has been an institution in North America for decades (Jin and Bouthillier 2007). Competitive intelligence professionals gather, analyse and distribute information about their competitive environment but tend to work in large groups and decisions are made collectively. Yet, according to Jin and Bouthillier 2008, very few studies focus on what happens to the information after it has been gathered. The literature on competitive information professionals is also not adequate for explaining information behaviour of an information provider in the context of the present study especially as the activities in competitive intelligence are regarded as more analytical and involving group strategic information seeking whereas information behaviour in the context of the present study covers the operational and tactical information activities of both individuals and groups (Frion 2009).

The setting for the present study, as described in chapter 4, is the data intelligence group of ISD where much happens to raw data and information when once they are gathered and changes to information interactions occur in response to changes in the external policy, health care and financial environments. The processes that comprise information behaviour could be represented by the logic model, as described within the theoretical framework in section 1.6, whereby insights into the value adding activities, outcomes and impact can contribute to effective management decision making.

This section has introduced a number of concepts, some of which have been found to have different definitions in the literature. Section 1.3 below presents operational definitions of key concepts which will also be used in subsequent chapters.

1.3 Key Operational Definitions

In LIS literature, the landscape harbours numerous definitions from various scholars in order to set their research studies in context. Some of these definitions are known to have subtle differences between them which could result in different interpretations of the concepts being explored. A clear understanding of the concepts used frequently in the context of the present study will be established in order to avoid misinterpretation. Kumar (2005) advises that it is essential to set out the operational definitions for the major terms that will be used in the study in order to obviate ambiguity and confusion.

1.3.1 Information

The present study adopts Shenton's (2004) definition of information as communicated messages that convey meaning. It is a subjective phenomenon which is situation specific. What is information for one person in a situation is not necessarily information for another person in another situation (Hjørland 2007).

The present study also concurs with the representation of information along a data-information-intelligence-knowledge continuum as depicted by Bouthillier who has carried out numerous empirical studies on competitive information professionals. Bouthillier et al (2003) describe the continuum of data, information, intelligence and knowledge and state that it is subjective assessment that distinguishes between information, intelligence and knowledge. Bouthillier et al (2003) add that data comprise facts, symbols and measurements, information comprises organised data with context, meaning and relationship, intelligence is analysed data with more meaning and more relationships, and knowledge is internalised information with associated beliefs and experience.

Many authors have attempted to define or explain the concept of information as it applies to the information sciences (Bawden 2007). The philosopher Popper, in Popper (1972, 2002), advises that it is unwise to state that one definition is the true definition, but it is better to use a definition to explain terminology in context. This view is supported by Saracevic (1999) who warns that information has a variety of connotations in different fields and goes on to state that, in information science, information is associated with messages.

Huang (2006) explains that information is an ambiguous concept and poses a problem for anyone who wants to define it in a comprehensive way. According to Bawden (2001), the term information has a variety of meanings in different contexts and communities of discourse. Bawden (2001) argues that the term bears a diversity of meanings from everyday usage, such as news in physical and non-physical states, intelligence and the communication of facts, to more technical subject areas such as data, instruction, signalling, energy, matter, space, time and coding in communications systems.

Macgregor (2005), in a conceptual paper that considers the nature of information in the twenty-first century and its implications, states that information is effectively the input and output processes of the mind and rarely yields any physical output. On the other hand, Macgregor (2005) explains that information can be processed and refined to result in a finished product whereas Miller (2002) argues that information on its own is quite static and lifeless and that it exists on computers, books, magazines, TV, CDs, reports, letters,

emails, faxes, memos, and so on, all waiting to have meaning attached by people. This argument concurs with writings by Myers and Myers (1998).

Floridi (2002) simply defines information as meaningful data. Meadow and Yuan (1997) support this view by stating that, to be information, messages have to have been received and understood or appraised. They explain that if the recipient's knowledge was not changed at the time of, or after, receipt of a message, the message is called data. On the other hand, if the recipient's knowledge were changed, then the message is called information.

It is clear that information is a complex phenomenon and many scholars have subtle differences in their conceptualisations of information. However, as stated at the start of this section, the subjectivity of information is important in that the meanings the messages convey can be interpreted differently by individuals. The operational definition of information from Shenton (2004) sets the scene for another complex term, information behaviour.

1.3.2 Information behaviour

The present study uses an operational definition of information behaviour as the totality of human behaviour in relation to how they need, seek, get, manage and give information in different contexts (adapted from Wilson 2000 and Fisher, Erdelez and McKechnie 2005a). There is emphasis on the word "totality" (Wilson 2000, p. 49) because it shows that information behaviour is a broad term that encompasses other aspects of human behaviour that transcend information seeking behaviour which is common in LIS literature.

Many definitions of information behaviour have been developed by LIS scholars and the definition used in the present study captures the complexity of the phenomenon and the range of views as to what comprises information behaviour.

Information behaviour has been the subject of discussions by library and information science researchers for some time. Mutshewa (2007a) reminds us that the term information behaviour could be misleading because it implies the behaviour of information rather than the behaviour of people. While Mutshewa (2007a) recognises that the term is now widely adopted and understood and has become a standard in library and information science, he suggests that perhaps a more grammatically correct term could be human information behaviour. The term human information behaviour has been used by a few researchers such as Spink and Cole (2006), Sonnenwald and Iivonen (1999) and Wilson (2000). However, because the term information behaviour is so widely used

and accepted in LIS literature, it is therefore the terminology of choice in the present study. It is explored further in section 2.4.

1.3.3 Information worker

The present study uses an operational definition of information worker as a person who, depending on his/her work function and role, seeks, gets, creates, manages, interprets, gives and consumes information in order to provide value-added information for self and others (adapted from Kuhlthau 1999). Related terms are information professionals (Mason 1990) and information practitioners (MacFarlane 2007).

The population within the research setting for the present study comprises information workers and their roles and functions are discussed in chapter 4.

1.3.4 Actors

Actors, in the present study, refer to individuals who interact with information and act within a defined context (Fidel et al 2004). Latour (1992) adds that they do things and Fidel et al (2004) argue that the interactions between the actors and information is the same as humans engaging in information work which is mediated by the tasks that they perform. When actors act, they do so within a network that consists of other human actors and/or non-human elements such as the technological and other organisational resources that the human actors can access (Latour 1992). The information workers in the present study are actors.

1.4 Research Aim

The aim of the present study is to describe, categorise and devise a representation of the experiences of information behaviour of an information provider. Information provider, in this context, refers to an organisation that provides health related information to customers in order to meet their information needs. The information provider employs information workers who interact with information by engaging in information behaviours. Within the environment of the information provider, the information workers are users of information just as their customers are. However, for clarity, the present study makes a distinction by referring to the information workers working within the provider organisation as '*internal users of information*' and their external customers as '*external users of information*'. '*Experiences of information behaviour*' is used in this study as a broad term which includes an individual's feelings, thoughts, perceptions and opinions about their information interactions.

The literature, as reviewed in chapter 2, reveals that studies that focus on the totality of information behaviours of information providers are scarce. Achieving the research aim will make a significant contribution to LIS knowledge because it will provide insights into information behaviour and perceived internal impact of information behaviour that practitioners can use to understand best practice and predict effects of information behaviours during periods of change. It will also be used by LIS curriculum developers as an opportunity for additional teaching material and by researchers to do further empirical studies to enhance and generalise the model.

This study of behaviour will make a small but important contribution to the understanding of complexity (Nicolis and Prigogine 1989). The research site for this study is a complex evolving organisation with complex processes that take place as information workers interact with information.

To make sense of the research aim, chapter 2 presents a review of the literature from which a conceptual framework, research questions and research objectives are developed.

1.5 Scope of Research

Boundaries have to be drawn around every research activity to prevent the study growing and becoming unmanageable. It is essential to state early in the present study that the scope is limited to the internal information environment of the information provider in order to meet the aim of the present study and focus on information workers and their interactions with information in the organisation.

In addition, because the study focuses on information workers' experiences of information behaviour at work which include feelings and perceptions, measurable individual characteristics such as personality, psychosocial state and socio-economic status are excluded from the study as they distract the reader from the central premise of experiences of information behaviour and stray into specialised areas which would make the thesis become unmanageable within the boundaries of library and information science.

1.6 Theoretical Framework

The theoretical framework for the present study presents the theory that explains why the problem exists. The framework provides a boundary within which variables will be identified and then sought in the extant literature for review. Kumar (2005) explains that the theoretical framework helps to maintain focus in relation to the search for appropriate

literature for inclusion in the review of literature. Without this framework the search for literature will be a never-ending task (Kumar 2005) which, in turn, would hinder the development of a robust research design. The framework was developed after initial reading of literature that demonstrated that there was a gap that supported the statement of the problem.

The framework presented in figure 1.1 below is an integrated theoretical framework with the input-activity-output-outcome-impact logic model as the main theoretical framework supported by three other theoretical frameworks to bring structure to the research and underpin the statement of the problem. Integrated theoretical frameworks have been used in other library and information science studies. For example, Becker et al (2010), in their investigation of the impact of U.S. public libraries on library users by conducting telephone and online surveys in addition to interviews, employed an integrated theoretical framework that comprised Moore's (1995) Strategic Triangle, Naumer's (2009) Situated Logic Model, Lampkin et al's (2006) Common Outcome Framework, Abrahamson and Fisher's (2007) Lay Information Mediary Behavior (LIMB) model and Creswell and Plano Clark's (2007) concurrent triangulated mixed methods research design in order to set out the study's underpinnings.
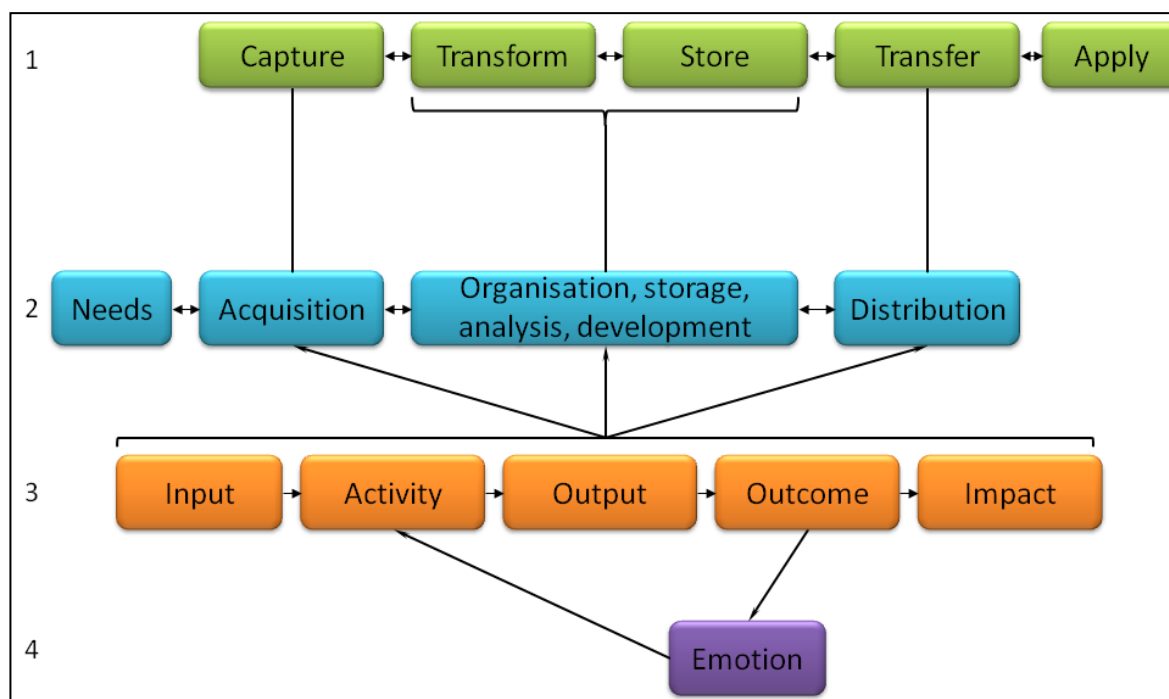
Figure 1.1 Integrated theoretical framework

Notes

1. The value added information chain (Cisco and Strong 1999, p. 4)
2. Information–processing model of competitive intelligence cycle (Bouthillier and Shearer 2003, p. 43)
3. The basic logic model (W. K. Kellogg Foundation 2004, p.1)
4. Theory of emotion as a feedback system (Baumeister et al 2007a, p. 173)

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The four theories in the integrated theoretical framework are described in the sub-sections below, starting with the main theoretical model, the Logic Model.

1.6.1 Logic model

In the context of the present study, the logic model is a series of sequential steps that show the relationship between the inputs to, and outputs from, a programme of work and the short-to-medium and longer term changes as a result of the inputs and outputs. It is the main framework within the integrated theoretical framework in figure 1.1. Taylor-Powell and Henert (2008) explain that logic models date back to the 1970s. Since then various definitions and configurations of the model have emerged in the literature. This view is supported by Wavell et al (2002) who state that as a result of the many versions of the logic model it has been difficult to develop universal definitions. Fielden et al (2007) also concur with Wavell et al (2002) and state that many variations of the logic model, and therefore many ways of developing the logic model, exist in the literature.

Logic models are "a systematic and visual way to present and share your understanding of the relationships among the resources you have to operate your program, the activities you plan, and the changes or results you hope to achieve" (W. K. Kellogg Foundation 2004, p.1). The purpose of a logic model is to provide a map or description of how specific components of a programme of work are related to the intended results of the programme (Gugiu and Rodriguez 2007). In the present study, information workers with various functions and roles embark on several pieces of work in attempting to meet the needs of customers. The visual representation of planned work, actual accomplishments and intended results serves as an opportunity for staff to identify areas of strengths and room for improvement amongst the articulated activities and outcomes. The logic model is a heuristic and iterative tool (Fielden et al 2007) which evolves as activities change in response to new demands from customers. It also helps managers plan, monitor, manage and evaluate work. It is the main theoretical model because it captures the basic functions of an information provider and the other three theoretical models represent subsets of part or all of the component parts of the logic model.

According to W. K. Kellogg Foundation (2004), a logic model does not have to be linear and can become a more complex visual representation as the input and activity interactions become more complicated. W. K. Kellogg Foundation (2004) also explain that models usually fall into one of three types – theory approach that emphasises the reasons for embarking on a programme of work; outcomes approach that emphasises the short, medium and long term outcomes and impact of the programme of work; and activities approach that emphasises the planned and actual activities of the programme of

work. The approach adopted in the integrated theoretical framework for the present study is the activities approach because, as the statement of the problem in section 1.2 explains, a gap exists whereby not much is known about information behaviour of an information provider beyond the information seeking and retrieval stages.

It is essential to clarify the definitions of the component parts of the logic model used in the present study so as to put the theoretical framework into context. The definitions are adapted from those of Wavell et al (2002), W. K. Kellogg Foundation (2004) and Taylor-Powell and Henert (2008) and they are as follows:

- Inputs are the human, financial, technological and organisational resources that are available to people for achieving a goal
- Activities are the processes and actions that are required by people in order to meet their goals
- Outputs are the services and products that arise from people combining inputs and activities
- Outcomes are specific changes in thoughts, feelings and behaviour as a result of positive or negative engagement with the outputs. They are short to medium term.
- Impact is the fundamental intended or unintended change occurring in organisations, systems or people as a result of the programme activities and engagement with the outputs. They are long term.
- Perceived impact is a subjective opinion of a change occurring in organisations, systems or people as a result of the programme activities and engagement with the outputs. They are long term. When the term perceived internal impact is used, it refers to the subjective opinion of a change occurring in the internal environment of the organisation; that is the people and their teams together with the organisation as a whole.

Bearing in mind that the present study is directed at people and their information interactions and perceptions in order to capture experiences, the logic model theoretical framework presented in figure 1.1 differs from many other uses of logic models. The difference is that it focuses entirely on the internal environment of the information provider as set out within the scope of research in section 1.5. Therefore it excludes the impact on customers outside of the organisation.

The present study is not an impact study which would have required an examination of how the activities and outputs actually impact on the internal environment of the organisation. Instead it captures *perceived internal impact*, a subjective variable, which does not require measurement but focuses on the internal environment of the

organisation and contributes to providing a picture of information workers' personal experiences of information behaviour.

1.6.2 Value added information chain

In ISD, value added information activities of data capture, data-to-information transformation, data and information storage and data transfer and distribution take place and these significant activities are expected to be explored as the study participants give accounts of their experiences of information behaviour. As information workers in the information provider organisation interact with information at various stages of the flow of information, it can be argued that value is being added to the information and that is why customers' information needs are met. If the information had no value at the end of the information activities of the information workers, then it would be useless to the customer. For these reasons a theoretical framework based on an information value chain is important to the present study.

Porter, a Harvard University professor of business strategy and competitiveness, described, in Porter (1985), the primary value adding activities in organisations as:

- Inbound logistics. These are activities concerned with receiving, storing and distributing the inputs to the product or service
- Operations. These are activities concerned with transforming the inputs into outputs, the final product or service
- Outbound logistics. These are activities concerned with collecting, storing or distributing the product or service
- Marketing and sales. These are activities concerned with making the customer aware of the product or service
- Service. These are activities concerned with enhancing or maintaining the value of the product or service

The primary value adding activities, according to Porter (1985), are linked to support activities in the organisation such as technology, procurement, human resource management and the organisational infrastructure. Together they form a visual representation of a powerful tool for strategic planning known as Porter's value chain.

Cisco and Strong (1999) used the principles of Porter's value chain to develop the value-added information chain that comprises five equivalent primary value activities as follows:

- Capture - activities concerned with acquisition or creation of data, information or knowledge

- Transform - activities concerned with organising, classifying, summarising, formatting, aggregating, structuring and filtering captured information
- Store - activities concerned with retaining, securing, protecting, and maintaining security of information
- Transfer - activities concerned with sharing, delivering, disseminating or presenting information
- Apply - activities concerned with using information to support decisions and actions in a feedback system (Cisco and Strong 1999).

Many other authors have developed versions of the information value chain such as Roosendaal et al (2003), Lai et al (2009), Saracevic and Kanotor (2003) and Crié and Micheaux (2006). Further discussion of information value chain is in chapter 2.

The capture of information right through to applying information while value is being added could be explained by using an example far removed from information science. Banana trees are grown and cultivated in a country with tropical climate. The bananas are then picked and sorted according to size and the bad ones separated from the good ones which are then stored under specified conditions. Value is being added to the bananas as all these activities are taking place because they are being prepared to meet the needs of the customer. The bananas are then transported to airports where they are then flown in cargo aeroplanes to the United Kingdom (UK). They are then received in the UK, transported to warehouses, and in turn transported to retail outlets where they are marketed. Customers then select the bananas, buy them and consume them to their satisfaction. The processes of capture, transform, store, transfer and apply are clearly in evidence in this banana cultivation, production and dissemination process.

It is evident that Cisco and Strong (1999) have a linear representation of their information value chain. They argue that it is for ease of representation because the stages involved do not necessarily occur in a linear manner.

1.6.3 Information processing model

Choo (1999, 2002) developed a model of information management cycle that comprised 6 closely related steps:

- Identifying information needs – activities concerned with identifying information consumers and understanding what it is that they require
- Acquiring information – activities concerned with getting or gathering information
- Organising and storing information – activities concerned with filing, storing and facilitating searching

- Developing information products and services – activities concerned with developing relevant content and value-added services
- Disseminating information – activities concerned with giving out information via channels and formats
- Using information - activities concerned with knowledge creating and decision-making

Bouthillier and Shearer (2003) adapted Choo's (1999, 2002) model to make it relevant to competitive intelligence professionals who are information providers. Bouthillier and Shearer (2003, p. 43) presented an "information-processing model of competitive intelligence cycle" and its adapted form is shown in figure 1.2 below.
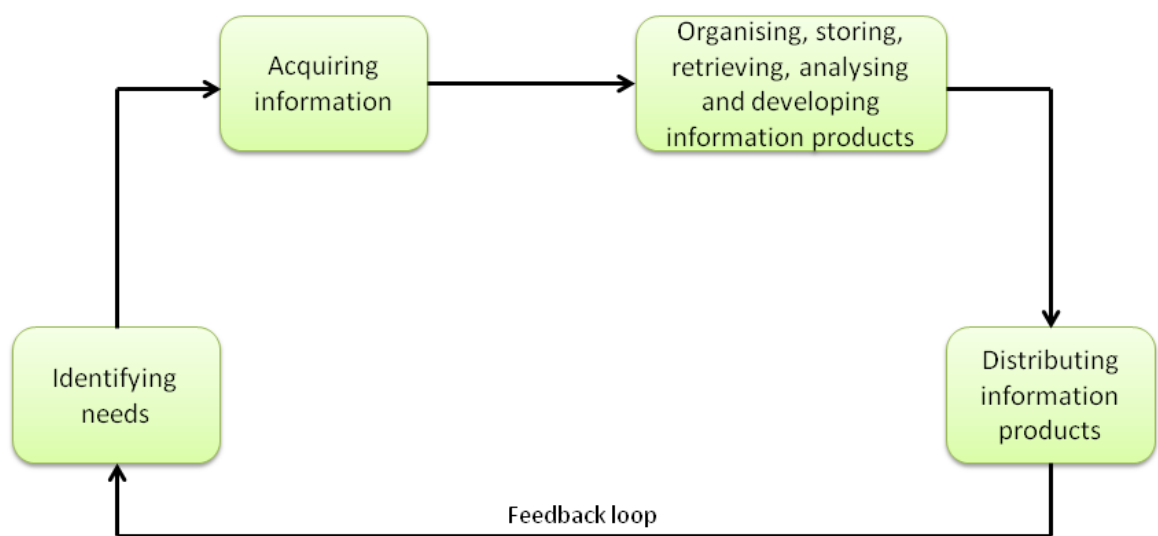
Figure 1.2 A model of competitive intelligence cycle

(Adapted from Bouthillier and Shearer (2003, p. 43))

Bouthillier and Shearer (2003, p. 43-56) and Jin and Bouthillier (2008, p. 3) describe the components of the information-processing model of competitive intelligence (CI) cycle as follows:

- Identifying needs - activities concerned with identifying the needs of the CI clients, intelligence needs, analysis techniques and the information needs
- Acquiring competitive information – activities concerned with identifying and acquiring external and internal reliable sources of information which include physical and electronic documents as well as people, while assessing the value of the information
- Organising, storing and retrieving – activities concerned with indexing, storing and retrieving data, information and intelligence

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- Analysing information – this is the most important step of CI work that involves activities concerned with synthesising and transforming information into intelligence which could involve over 100 types of analytical techniques
- Developing CI products – activities concerned with formatting, designing and packaging the finished reports for the clients
- Distributing CI products – activities concerned with disseminating information to various individuals within the organisation at various stages of the CI cycle and also disseminating the finished product to the client.

Bouthillier and Shearer (2003) also introduced a feedback loop in their model which improves the quality of the CI product. It is shown in the adapted diagram in figure 1.2 as connecting the distributing stage to the needs identification stage. Bouthillier and Shearer (2003) added that each step of the iterative CI cycle adds value to the competitive intelligence product.

The information-processing model of CI cycle is particularly relevant to the present study because competitive information professionals are information providers who engage in processes that add value to information, as do information workers in the present study's research location. In addition, there are similarities between the CI cycle, Cisco and Strong's (1999) information value chain and W. K. Kellogg Foundation's (2004) logic model, and the steps shown in figure 1.2 provide the building blocks for exploring experiences of information behaviour in the present study's context. These are further explored in section 1.6.5.

Bouthillier and Shearer (2003) highlighted a significant difference between their model and that of Choo (2002). This was the presence of *information use* as the final step in Choo's (2002) model. Bouthillier and Shearer (2003) argue that they decided to remove information use as an end-stage from their model because the use of competitive intelligence falls outside the scope of any competitive intelligence operation. The present study excludes *information use* from the integrated framework. The reason is that the present study takes the view that *information use* not only involves the external information consumer interacting with information while seeking it, but occurs within every information interaction and is therefore not a stand-alone activity or process which needs to be highlighted as a distinct step. It is discussed further in section 2.4.1.5. Although other versions of competitive intelligence models exist, they are variants of Bouthillier and Shearer's (2003) model with minor differences in the terminology. Together with Bouthillier and Shearer's (2003) model, they reveal what happens to competitive information between acquiring information and distributing information and therefore contribute to the integrated theoretical framework for the present study. One example is

Pirttilä's (1998) Competitive Intelligence Cycle which has only 4 stages – identification of needs, collection, screening and analysis, and distribution - but it is, in essence, similar to the Bouthillier and Shearer's (2003) model.

1.6.4 Theory of emotion as a feedback system

Baumeister et al (2007a) argue that emotion plays such an important part in our lives that it would be impossible to imagine human existence without it. The interplay between behaviour and emotion is depicted in the theory of emotion as a feedback system developed by Baumeister et al (2007a). Baumeister et al (2007a) state that behaviour as a concept includes emotion and cognition because of the strong relationship between the 3 terms. They state that, taking a broad view of the word behaviour, it could be argued that "emotion is behavior" (Baumeister et al 2007a, p. 171) but add that they prefer to distinguish the psychological terms *emotion* and *cognition* from the term *behaviour* which they describe as "physical or meaningful action" (Baumeister et al 2007a, p. 171). However, while emotions can be experienced as a result of behaviour, there are other variables such as other people's behaviour and external circumstances that can cause emotions (Baumeister et al 2007a).

In the integrated theoretical framework in figure 1.1, emotion is shown on its own, as an outcome of behaviour which influences future behaviour as a feedback system, in order to keep the framework simple. However, to put it into context, it is part of a bigger theory of emotion facilitating learning for future behaviour as shown in figure 1.3.
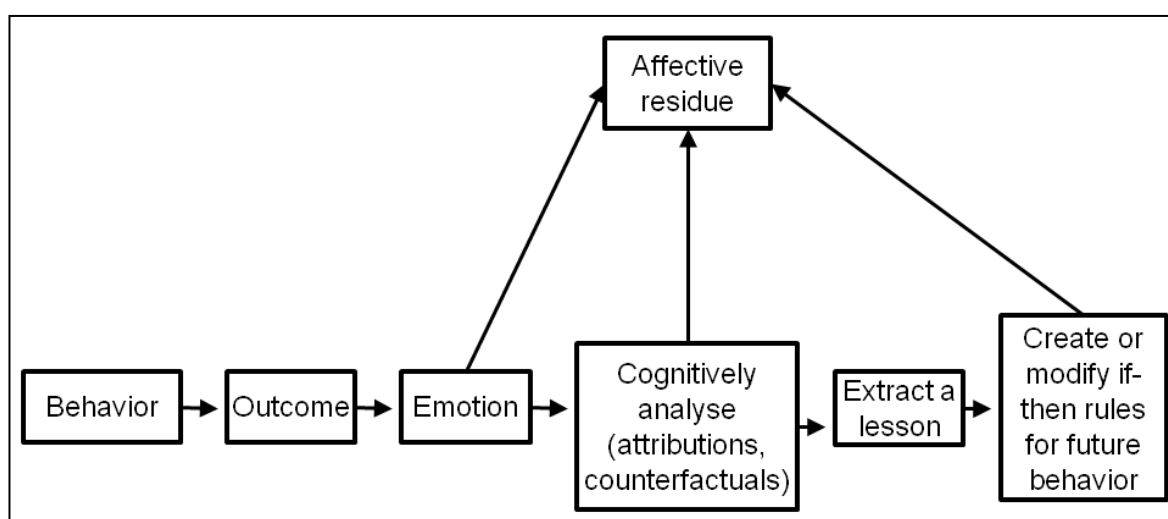
Figure 1.3 Theory of emotion as a feedback system

(Baumeister et al 2007a, p. 173) (© Sage Publications. Reprinted with permission)

Baumeister et al (2007a) provide definitions for some of the terms used in their theory. They describe the following terms:

- "Emotion is a state of conscious feeling, typically characterised by physiological changes such as arousal
- "Affect refers to conscious or non-conscious automatic responses [which] are no more than a quick twinge of feeling … that do not involve the elaborate cognitive processing of conscious emotion" (Baumeister et al 2007a, p. 168-169).

Both conscious emotion and automatic affect, according to Baumeister et al (2007a), have a relationship with behaviour; with emotion being slower than affect because, with emotion, cognitive processing takes place to learn from the emotional experience before future behaviour is influenced, whereas the effect of affect responses on behaviour are almost instantaneous. Baumeister et al's (2007a) theory in figure 1.3 shows that emotions and automatic affect occur in the aftermath of behaviour and its outcomes. Automatic affect can directly influence future behaviour and conscious emotions trigger counterfactual thoughts or cognitive reflection in order to extract lessons about how a different behaviour might result in a more positive emotional state. The learning from these lessons is then used to update the individual's if-then rules or create new rules which help the individual cope in a complex world. The internal rules then influence the affective residue which serves as the push for influencing future behaviours.

In summary, "an action or event leads to a full-fledged conscious emotional reaction, which stimulates cognitive reflection, which in turn produces some conclusion in the form of a (new or revised) prescription for action" (Baumeister et al 2007a, p. 174). Emotion, and not affect, is therefore used in the integrated theoretical model because it is the experience that is most likely to be described in retrospect by an actor who has experienced it because it is always conscious. Affect, on the other hand, can be very brief and unconscious and most likely to be erased from memory.

Baumeister et al (2007a) present additional theories that represent how past memories of behaviour and past emotional states can affect future behaviour. However, they are not part of the theoretical model for the present study which limits itself to the emotions that emerge as a result of behaviour as explained in section 1.5.

1.6.5 Integrating the components of the theoretical framework

The integrated theoretical framework in figure 1.1 highlights the presence of a high degree of congruence between Cisco and Strong's (1999) framework and Bouthillier and Shearer's (2003) framework especially with regard to the similar meanings conveyed by

Cisco and Strong's (1999) 'capture' stage and Bouthillier and Shearer's (2003) 'acquisition' stage. In addition, the 'transform and store' stages convey similar meanings to the 'organisation, storage, analysis and development' stage, and the 'transfer' stage conveys meanings similar to the 'distribution' stage.

Based on similarity of meanings of terms within each framework, the present study assumes that the 3 stages represented in the integrated framework are:

(i)   capture = acquisition,

(ii)   transform + store = organisation, storage, analysis and development,

(iii)   transfer = distribution

The integrated theoretical framework also shows that each of the stages can have the logic model of input-activity-output-outcome-impact applied so as to understand the information activities and their perceived effects within the internal information environment of the information provider and to determine how the outputs and outcome from one stage can inform the inputs of the next stage.

With the theoretical framework being integrated and having a great number of variables of interest, it is essential that the literature review in chapter 2 reflects the boundaries set in chapter 1 so as to ensure that appropriate research questions and objectives are, in turn, developed for informing a research design.

1.7 Structure of Thesis

Chapter 1 introduced the topic of the research and set the scene for the research that will result in the development of a model of information behaviour of an information provider. This included arguments in support of the assertion that there is not enough information for understanding experiences of information behaviour of an information provider, and that the development of a model of information behaviour that would not only be useful to the research location for understanding the work, thoughts and feelings of its information workers but would provide an original contribution to LIS knowledge.

Chapter 2 reviews the relevant extant literature on information behaviour models and approaches, affect, emotions and feelings, impact, and information value chain.

Chapter 3 presents the conceptual framework, research questions and objectives for the study.

Chapter 4 describes and justifies the methodology and methods for the study, including details of the study's philosophical lens and the qualitative and quantitative phases. It also describes the method of gaining access to the field, ethical considerations and the process of returning to the research participants for validating the findings.

Chapters 5, 6 and 7 respectively present the findings of the interviews, questionnaire survey findings, and the research participant feedback and final model that emerged from the respondent validation workshops.

Chapter 8 discusses the overall quality of the study, the model of information behaviour of an information provider, checks that the aim and objectives of the study were met, and provides a critical reflection of key stages of the study.

Chapter 9, the last chapter, concludes with summarising the main findings, setting out the limitations of the study, presenting the contributions to information practitioners, recommending further research, and arguing that the research makes an original contribution to knowledge.

1.8 Summary

This chapter has introduced the phenomenon of information behaviour of an information provider while setting out the statement of the problem, motivations for embarking on this research, study aim and brief scope of research. The chapter has shown that there is a case for determining the information behaviours of information workers in an information provider organisation. It is acknowledged that empirical studies have been done on competitive intelligence professionals, journalists and reporters and rail information staff but they are not adequate for describing and understanding information behaviour of an information provider.

The statement of the problem highlights the gap in the literature with regard to inadequate LIS empirical work on information providers' information behaviour both from the perspective of the activities that information providers engage in and what happens to information within a provider organisation's internal information environment when once the information is acquired.

Key operational definitions of information, information behaviour, information worker and actor have been provided to set the scene for the present study. It is argued in the chapter that the concepts of input, activity, output, outcome and perceived impact can be understood from the standpoint of the internal provider environment. This internal

information environment is where all the clusters of activities of information behaviour require inputs, are about activities, have outputs, result in outcomes, and the people involved in the activities have perceptions of the internal impact of their activities.

Although the detailed scope of the present study is to be outlined later on in chapter 3, this chapter nevertheless explains that the present study is about the internal information environment.   Therefore the concept of information use in relation to how customers interact with information that they obtain from the services of information providers is not in scope.

The theoretical framework is presented which sets the direction of travel of the literature review and links to the statement of the problem. The theoretical framework is integrated and interconnected with an overarching main framework, the logic model, alongside 3 secondary frameworks of theories of emotion, information value chain, and CI information processing.

An overview of the structure and layout of the thesis is also described in the chapter.

CHAPTER 2: Review of Extant Literature

2.1 Introduction

"A literature review is a systematic, explicit, and reproducible method for identifying, evaluating, and synthesizing the existing body of completed and recorded work produced by researchers, scholars and practitioners" (Fink 2009, p. 3).

The purpose of this literature review is five-fold:

- to help identify gaps in the literature and prevent duplication of effort
- to connect and compare opposing schools of thought related to methodologies, approaches and variables of interest so as to shape and reshape the research questions and design of the present study
- to provide evidence of a theoretical background to the present study so as to increase its validity
- to cite the works of identified scholars and researchers with particular interests, strengths and views about the area of research pertinent to the present study
- to learn from recommendations and experiences of researchers in the discipline so as to develop the most appropriate approaches and limit exposure to predictable problems.

To maintain scope and boundaries, the broad, high-level, concepts that will facilitate the initial literature search are 'information behaviour', 'emotion', 'impact' and 'information value'. This chapter will consider each of these concepts in turn and appraise studies that address these concepts.   These concepts are of relevance to the present study because, together, they capture a picture of the interactions with information by an information provider as the literature demonstrates and the theoretical framework reveals.

Reference to some of the literature presented in this chapter is sometimes brief. At the same time, others are given more attention because they shine light on the phenomenon of information behaviour, present with well-defined defined methodologies, and their findings are of particular significance and therefore relevant in shaping the research questions.

2.2 Literature review methodology

A mini literature review commenced with the development of the theoretical framework which is described in chapter 1 and which was a result of seeking and reading the

literature to provide a framework for starting the main literature review described in this chapter. Kumar (2005) described the paradox in which it is essential to go through the literature in order to develop a theoretical framework and yet the literature can only be effectively reviewed when a theoretical framework has been developed. Kumar (2005) suggests that it is possible to go through the literature without great depth in order to develop a theoretical framework which, in turn, provides structure for the more in-depth literature review for justifying the statement of the problem and creating a conceptual framework.

The key phases involved in the literature review which are iterative and generally occur concurrently are:

- The literature search process
- Reading and appraising the literature which not only includes the discipline being studied (information science) but related disciplines such as psychology and organisational management
- Creating boundaries so that there is justification for excluding and using literature
- Managing the literature using Refworks reference management software (Refworks 2009)
- Writing up the review

Garson (2002) advises that a literature review should be by variables and not by other criterion such as research design methodology, conclusion or currency of research which should be allowed to emerge from the review by variables. A flow chart of the literature search process is shown in figure 2.1. It is adapted from a flow chart of a literature search process developed by Hart (1998).
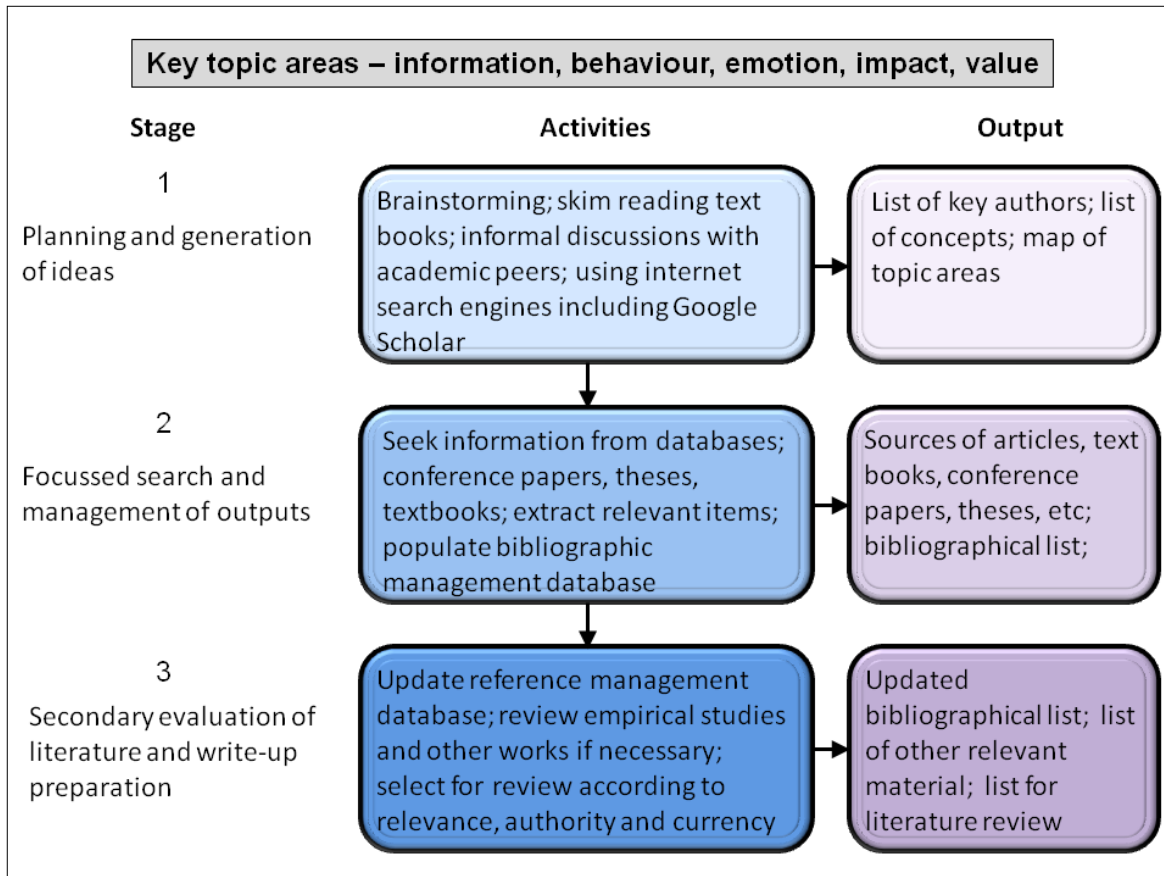
Figure 2.1 Flow chart of literature search process

(Adapted from Hart 1998, p. 34)

2.2.1 Stage 1 of the literature search process

Stage 1 of the flow chart of literature search process involves planning and generation of ideas. This is the stage at which ideas for obtaining literature are sought by brainstorming, discussions with colleagues, other researchers and research supervisor, learning from others during networking at conferences and workshops, skim reading textbooks from libraries and doing general searching and serendipitous internet browsing. These are done with a view to obtaining a list of key scholars of the discipline, key concepts and the topic areas. Some examples of the relevant facts, ideas and concepts are mapped out in figures 2.2, 2.3, 2.4 and 2.5 using mind mapping software. They are not exhaustive but depict the process of generating information for literature search.
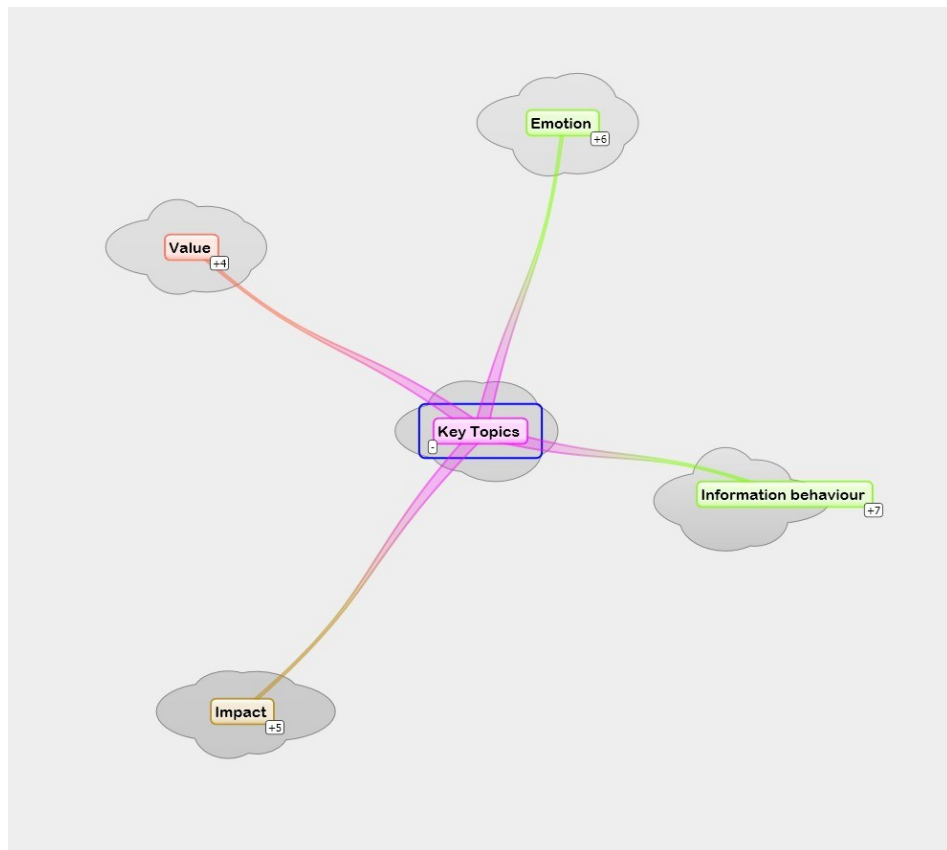
Figure 2.2 Map of high-level key topic areas and concepts
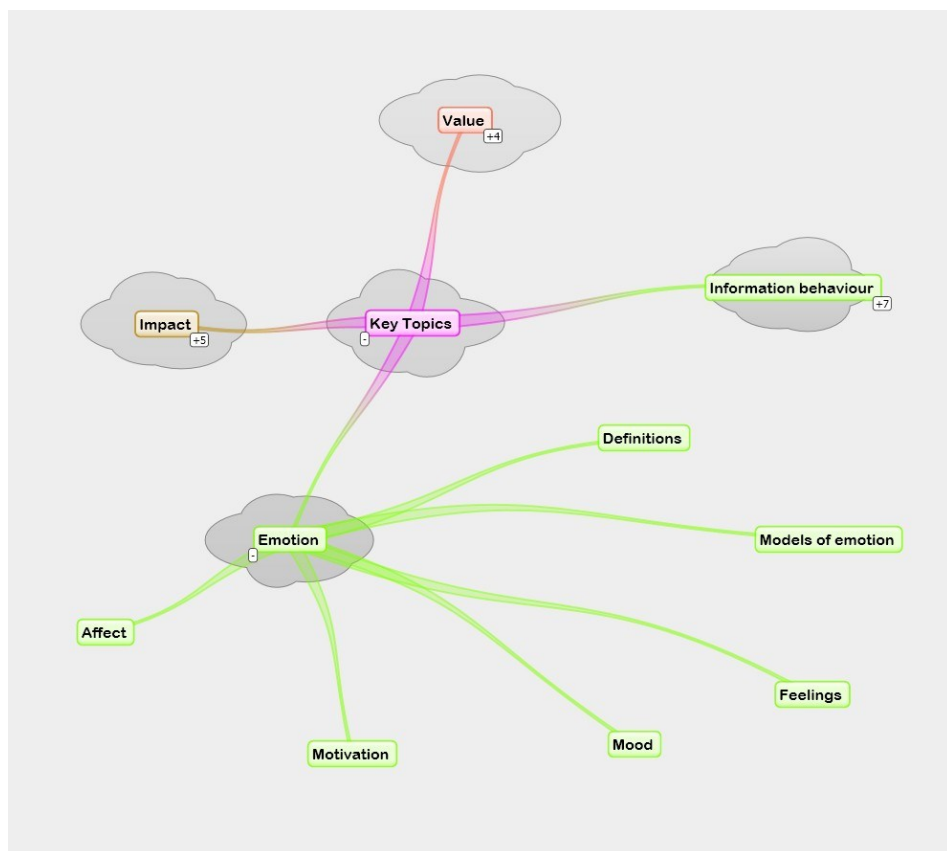
Figure 2.3 Map of topics and concepts for 'emotion'
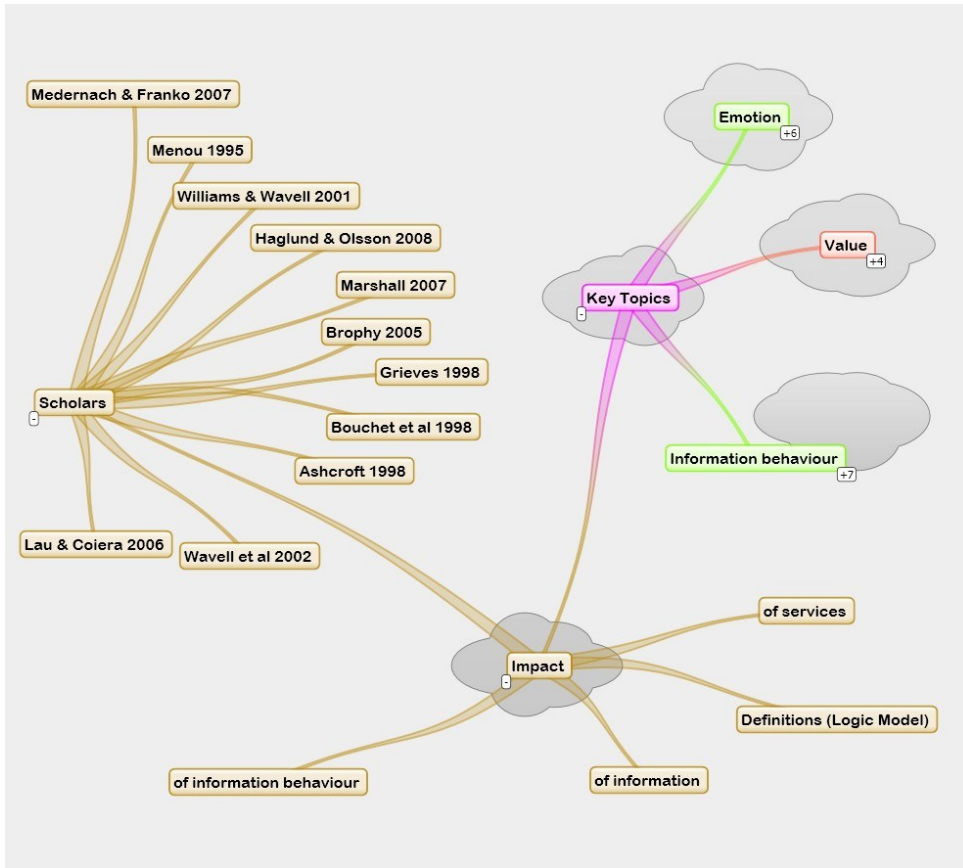
Figure 2.4 Map of topics and concepts for 'impact'
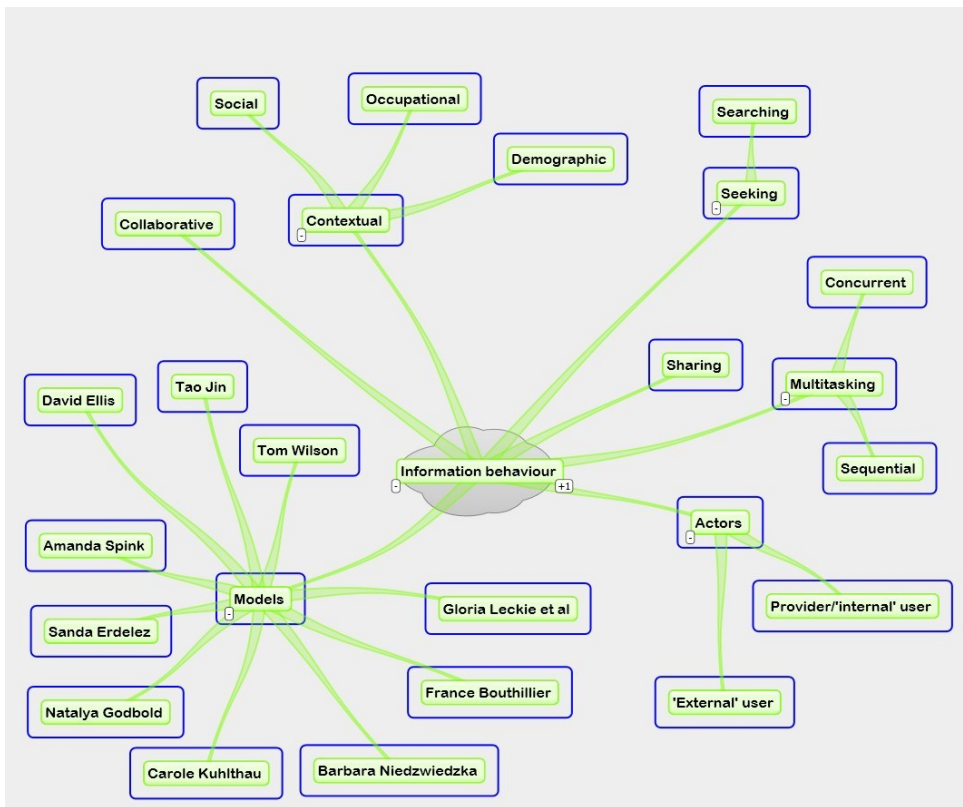
Figure 2.5 Map of topics and concepts for 'information behaviour'
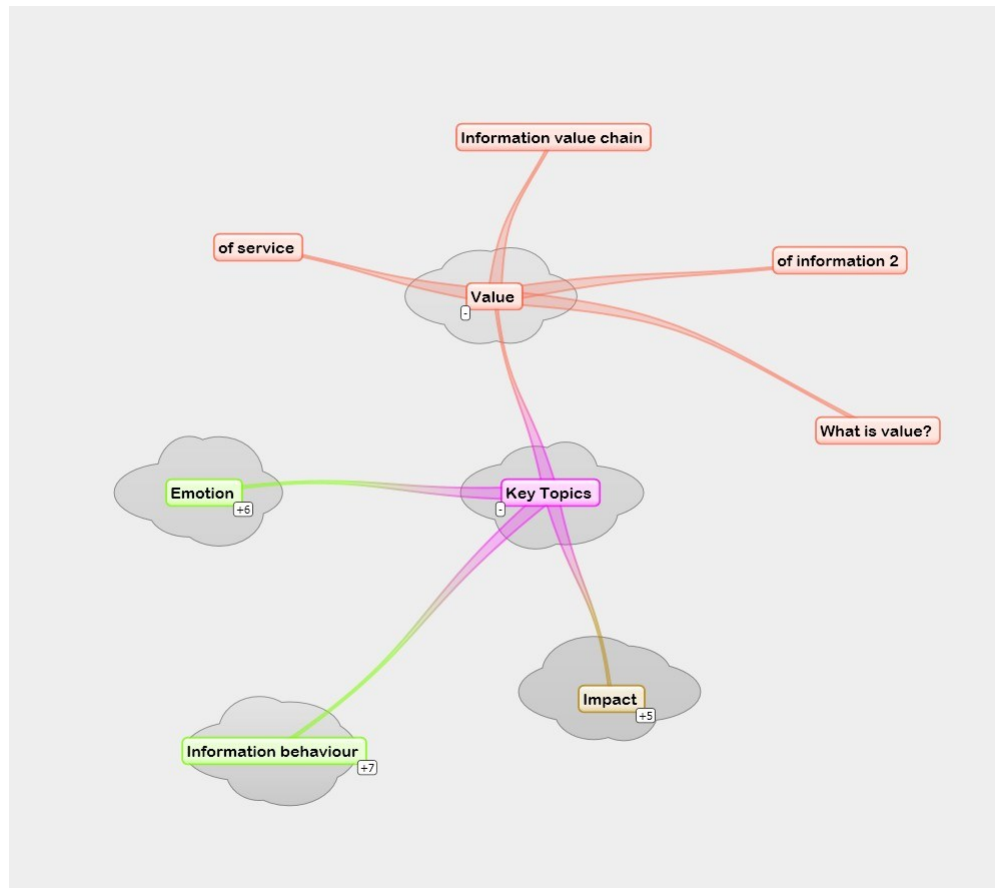
Figure 2.6 Map of topics and concepts for 'value'

2.2.2 Stage 2 of the literature search process

Stage 2 of the flow chart of literature search process is focussed search and management of outputs. At this stage, a variety of sources of information are accessed, citation tracking techniques are employed, and a comprehensive bibliographic list is maintained using Refworks (Refworks 2009) which is freely available via Robert Gordon University. Some of the sources accessed are listed below. They are in addition to personal visits to academic libraries to access physical copies of books and journals not available electronically.

Catalogues

- Robert Gordon University (via http://www.rgu.ac.uk/library)
- The Knowledge Network (via http://www.knowledge.scot.nhs.uk)
- Health Management library (via
  http://www.healthmanagementonline.scot.nhs.uk)

Databases

- Directory of open access journals
- Emerald Full text and Emerald Management Reviews
- EBSCO Collections
- Ingenta
- Library Literature Online
- SAGE Journals Online
- Library Literature Online
- LISTA (Library, Information Science and Technology Abstracts)
- ScienceDirect
- SpringerLink
- Wiley Online Library
- PsycINFO [EBSCO]
- Ovid Collection
- ERIC
- PubMed
- Health Management Information Consortium
- Psychology and Behavioural Services Collection
- Web of Knowledge
- ZETOC

Other sources (not exhaustive)

- Google Scholar (http://scholar.google.com)
- Strategic and Competitive Intelligence Professionals (http://www.scip.org)
- Central Intelligence Agency (https://www.cia.gov)
- Free online repositories of relevant literature (e.g. http://www.jurn.org/, http://www.nova.edu/ssss/QR/)

Searches uses Boolean combinations of the terms information, behaviour, behavior, emotions, impact, value were used and these returned large numbers of journal articles which had to be reduced by using 'limit to' operators or their equivalent within the databases. Two examples are listed below:

- information AND behaviour as search terms in ScienceDirect database returned 1,340,440 journal articles which reduced to 7355 using the 'social science and medicine' limiter within the ScienceDirect database. The search term had to be edited several times to reduce the number of articles further.

- emotion AND behaviour as search terms in Psychology and Behavioural Sciences Collection database returned 3285 results which were eventually reduced to 109 using various limiters as shown in figure 2.7

Figure 2.7 Example of use of limiters to refine search term

2.2.2 Stage 3 of the literature search process

Stage 3 of the flow chart of literature search process involves re-reading the literature to reduce the number for review according to criteria such as relevance, authority and currency. At this stage some literature are discarded altogether and others remain in the updated bibliographic database. As the topic of inquiry progresses, existing concepts are revisited, new concepts emerge and related searches are carried out in literature databases in order to capture as broad a range of reference material as possible across disciplines. Spink, Ozmutlu and Ozmutlu (2002) refer to this process of repeated searching as successive searching. In the end, studies and other works that are selected for review are those that illuminate the phenomenon of information behaviour and have profundity so as to contribute to the development of the research questions while being tethered to the integrated theoretical framework described in chapter 1. A shown in figure

2.1, not all the lists of literature were used in the literature review. A list of relevant material was compiled for use throughout the other chapters in the thesis. Section 2.2.3 examines the literature selection criteria in more detail.

2.2.3 Literature selection criteria

While information behaviour is the phenomenon of interest that guided the selection of the literature from the search strategies, there were nevertheless certain criteria that formed the basis of the selection of literature for review. The selection criteria were as follows:

- Studies involving a range of research subjects and groups
- A range of qualitative, quantitative and mixed methodologies
- A range of methods and approaches to the problem
- Clear information within the literature to facilitate an informed evaluation
- A range of information behaviour and related variables of interest
- Conflicting points of view
- Not just confined to current literature because some older studies are of such significance and authored by such eminent scholars that they are quoted regularly in current literature
- Mainly primary sources
- Multidisciplinary approaches

2.2.4 Literature review process

Having searched for, and selected literature for review, the next stage was to prepare the literature for review. Some were grouped together as shown in tables 2.1 and 2.2 and others were used within the appropriate section in rest of this chapter.

2.3 Information

No discussion of information behaviour can take place without first a discussion of the concept of information in order to grasp the meaning of information behaviour. While the present study has adopted a definition of information as communicated messages that convey meaning (Shenton 2004) as the operational definition, it must be noted that several researchers have differing opinions of the very word information. Meadow and Yuan (1997) and Wilson (2000) proffer similar definitions to that of Shenton (2004) but Wilson (2000) goes further by arguing that data is subsumed under information and that data may or may not be information, depending on the user's understanding.

Bawden (2001) argues that the term information bears a diversity of meanings from everyday usage, such as news in physical and non-physical states, intelligence and the communication of facts, to more technical subject areas such as data, instruction,

signalling, energy, matter, space, time and coding in communications systems. Cole (1997), on the other hand, argued for information as a process with a beginning and an end which is constructed by the individual. He reported the results of a study that comprised interviews of a convenience sample of 45 history PhD students. Cole (1997) concluded that, although the results could not be generalized due to the bias in some of the characteristics of the subjects such as age, mode of PhD study and gender, he proposed a model of a 5-stage information process that comprised the opening, cognitive activity, corroborating evidence, the closing, and the effect of process. The information as process model therefore comprised both cognitive activity and information seeking behaviour resulting from this activity, thus encapsulating the works of Belkin (1990), Dervin (1992) and Kuhlthau (2004).

On the other hand, Menou (1995a,b) captures both the ideas from Bawden (2001) and Cole (1997) by arguing that information relates to both processes and material states which are closely inter-related and may often come to play in any situation, thus supporting Belkin's (1978) review of information concepts. Menou (1995a) categorises information into 5 states, namely product, object, process, channel and contents that are described fully in Menou (1995b) where he explains that they constantly interact and are interdependent. Shenton (2004) supports Menou's (1995a) description of information as a product by arguing that many user studies are based on an assumption that information denotes physical entity such as journals and books.

The physical entity of information in books, magazines, reports and memos have been described as lifeless and static by Miller (2002) and Myers and Myers (1998). They argue that this is because information awaits meanings to be attached to it by humans.

Shenton and Hayter (2006) attempted to explore a range of areas associated with phenomenographic research into information. One of the few stumbling blocks they encountered was that, "since so little work on users' perceptions of the word 'information' has been conducted, no widely accepted framework for investigation has yet been developed that prospective researchers can adopt or even adapt" (p. 564). Shenton and Hayter (2006) concluded that the term 'information' "remains problematic and has seldom been explored from the information user's perspective" (p. 576), and recommended that it is essential to develop a conceptual framework on which to base further research in order to understand what the term means to information users across different contexts and situations.

Bates (2006) presents and justifies two definitions of information as follows: "The pattern of organization of matter and energy" and "some pattern of organization of matter and

energy given meaning by a living being" (Bates 2006, p. 1042). However, Hjørland (2007) argues that Bates' definitions are flawed because Bates (2006) attempts to present a definition with both objective and subjective phenomena and trying to have it both ways. Hjørland (2007) therefore presents alternative explanations of information by Goguen (1997), Karpatschof (2000), Spang-Hanssen (2001), Hjørland (2002) and Raber and Budd (2003), that are based on subjectivistic epistemology, that is, only when the person attaches meaning or has an understanding, can it be referred to as information. Bates (2008), in response to Hjørland (2007) argues that her theories are misconstrued and that she does believe in the universal existence of information which is subjectively constructed by humans (Bates 2008). Zins (2007), on the other hand, captures both the objective-subjective arguments of Bates (2005b, 2006, 2008) and Hjørland (2007, 2011) in his 130 definitions of the data, information and knowledge obtained from 45 scholars via a Critical Delphi study, develops 5 definitional models of the concepts and, within each model, categorises the concepts as universal or subjective. Zins (2007) shows that 3 out of the 5 models characterise information as being both subjective and universal whilst one model shows information as subjective only and the other universal only.

The arguments for and against the objective-subjective duality of information are clearly shown in the literature but the pragmatic explanation by some researchers that information can exist universally while requiring subjective construction by humans is one that eliminates the objective-subjective polarity and influenced the operational definition of information as set out in section 1.3.1.

2.4 Information behaviour

According to Fisher, Erdelez and McKechnie (2005a), information behaviour is flourishing in the field of library and information science (LIS) with the development of numerous theories and models. Case (2007) asserts that a range of activities such as "encountering, needing, finding, choosing and using information" (p. 4) which are components of information behaviour are basic to our human existence. Spink and Cole (2004) agree with this assertion and they explain further by stating that our survival is dependent upon our ability to use acquired information to adapt to a dynamic physical and social environment. Spink (2010), in her descriptions of information behaviour as an evolutionary instinct, goes further than Spink and Cole (2004) and explains that this instinct to engage in information behaviour is one that humans are born with rather than taught, so they understand the need to engage in these activities in order to make sense of their environment. These activities of information behaviour occur in everyday settings as humans go about their daily lives but they become pertinent to the present study when people engage in these activities in a work setting that aims to meet the information

needs of customers. Wilson's (2000) definition of information behaviour is broad, meaningful and encapsulates most of the other definitions proposed by information science researchers. Rose (2006) asserts that Wilson's definition provides the broadest possible view of the relationship between information and people.

Since the concept of information behaviour started to evolve four decades ago from a focus on information systems to human beings, much has been written about information seeking behaviour and more is being learned about the information behaviours that take place when once information is found mainly from the perspective of the end-user of information. However from the perspective of the information provider, much more needs to be known about their information behaviours as described in chapter 1. With the aim of the present study being to determine, categorise and devise a representation of information behaviour of an information provider, it is a relevant, timely and much needed contribution to the phenomenon of information behaviour.

2.4.1 Definitions and descriptions

Understanding information behaviour helps towards unravelling the complexity, uncertainty and variety in the field of information (Solomon 1997a, b, c). With diverse views of the concept of information from leading scholars, it is not surprising that information behaviour is even more complex.

A plethora of scholars have studied information behaviour over the years and arrived at various definitions and descriptions of the concept. Evidence of this is apparent in the compilation of theories of information behaviour from 85 contributing scholars in Fisher, Erdelez and McKechnie (2005a) which are diverse, rich and add to the interdisciplinary nature and complexity of the information behaviour body of knowledge. The theories continue to grow (Fisher, Erdelez and McKechnie 2005a) and this is a sign of the plausibility of Spink's (2010) assertion that information behaviour is essential for human existence and Case's (2007) contention that almost everything to do with human beings is related to information behaviour. Wilson (2008) used just one database – Web of Science – to demonstrate that, between 1990 and 2006, searching for papers with the keywords 'information', 'seeking', and 'behavio(u)r' the number of papers returned increased exponentially from 9 in 1990 to 200 in 2006.

In one of his papers on the history and overview of the field of information behaviour, Wilson (2000) presents 3 hierarchies of information behaviour. Wilson (2000) argues that the highest level is 'information behaviour' which he defines as the "totality of human behaviour 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 … without any intention to act on the information given" (Wilson 2000, p. 49).

2.4.1.1 Information seeking

One of the levels down from information behaviour is 'information seeking behaviour' which Wilson (2000) defines as "the purposive seeking for information as a consequence of a need to satisfy some goal … the individual may interact with manual information systems or with computer-based systems" (p. 49). A third level is 'information searching behaviour' which is defined as "the micro-level of behaviour employed by the searcher in interacting with information systems of all kinds. It consists of all the interactions with the system, whether at the level of human computer interaction or at the intellectual level which will also involve mental acts such as judging the relevance of data or information retrieved" (Wilson, 2000, p.49). Fodness and Murray (1999) refer to this term as 'information search behaviour'.

Much of the LIS literature on information behaviour focuses on information-seeking behaviour, that is, Wilson's (2000) subset of information behaviour. Information seeking behaviour, according to Majid, Anwar and Eisenschitz (2000), encompasses the ways individuals articulate their information needs, seek, evaluate, select and use the needed information. Here their definition goes beyond seeking and into use of the information which creates a lot of confusion about what is being defined. It departs from Wilson's (2000) definition of information seeking which does not mention the use of information. Pálsdóttir (2010) and Williamson (1997) argue that there are two types of information seeking. Active (or purposive) information seeking refers to behaviour where individuals experience a lack of knowledge and act on it by seeking information. Passive information seeking or accidental information acquisition or information encountering (Erdelez 1997) refers to instances such as when use of mass media results in information acquisition even though information seeking was not intended and the person may not mean to act on the information received; that is, accidental information discovery. Foster and Ford (2003) refer to this phenomenon as serendipity and explain that serendipity may go beyond the purely accidental and, to some extent, be actively sought.

Johnson et al (2006), like Wilson (2000), do not make the distinction between the types of seeking behaviour. They define information seeking behaviour as the purposive acquisition of information from selected information carriers. Information carriers include "a variety of channels, a variety of sources within channels, and a variety of messages contained within these sources" (Johnson et al 2006, p. 570). Tidwell and Sias (2005) propose a broad definition of information seeking behaviour as "the proactive

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communicative process of gathering information from one's environment, typically for the purposes of uncertainty reduction" (p. 52).

It is evident that there are many definitions of information seeking and, while some limit their definitions to depictions of acquiring, gathering and selecting information, others create confusion by including, in the definition of information seeking behaviour, the concept of information use which is not usually explained. It could perhaps mean the behaviours that occur when once information is found or it could refer to any interaction with information. This is further explored in section 2.4.1.5.

2.4.1.2 Information activities

Rose (2006), in his study of the information activity of rail passenger staff, introduced the term 'information activity' which he defines as goal-directed human behaviour in relation to sources and channels of information. These activities are lower level information behaviours that are specific to different sets of work tasks. In the literature, there is oftentimes the use of the phrase information activity which another scholar may refer to as information behaviour. The present study refers to information activities as the constituents of the information behaviour. A non-exhaustive list of some relevant information activities and behaviour that have been highlighted by researchers is shown in table 2.1.

Table 2.1 Some information activities and behaviours

Author(s)	Activity/behaviour
Li et al (2007), Bao and Bouthillier (2007)	Sharing
Ellis (1989), Ellis, Cox and Hall(1993)	Starting, chaining, browsing, differentiating, monitoring, extracting, verifying, ending
Dervin (1989)	Browsing, formatting, grouping, highlighting, indexing, citing, digesting, abstracting, formulating, transmitting, interpreting, connecting, skimming
Foster (2004), Stokes and Urquhart (2011)	Serendipity, reviewing, identify keyword, problem definition, keyword searching, eclecticism, chaining, browsing, incorporation, knowing enough, sifting, verifying, networking, refining, monitoring, picture building, breadth exploration
Meho and Tibbo (2003)	Accessing, networking, verifying, managing
Spink and Sollenberger (2004), Belkin (1993), Fidel et al (2000)	Retrieval
Erdelez (1999)	Browsing, environmental scanning, information encountering
Auster and Choo (1994),	Environmental scanning

Author(s)	Activity/behaviour
Jogaratnam and Law (2006), Hambrick (1981), Jain (1984)	
Erdelez (2004)	Noticing, stopping, examining, capturing, returning
Bates (2002), Qui (1993), Chang and Rice (1993)	Browsing
Meho and Tibbo (2003)	Information managing, verifying, networking, accessing
Cole and Leide (2006)	Information organising
Mchombu (2003)	Information dissemination
Fodness and Murray (1999)	Selecting, acquiring, evaluating
Spink (2010), Pirolli and Card (1999)	Information foraging
Williamson (1998)	Incidental information acquisition
Huang and White (2010)	Parallel browsing
Talja (2002)	Information giving
Bates (1989)	Berrypicking
Makri and Warwick (2010)	Finding, assessing, interpreting, using, communicating
Savolainen (2009), Kari (2007, 2010), Todd (1999), Choo et al (2006), Choo et al (2008)	Use, utilisation

2.4.1.3 Multitasking

Spink, Park and Cole (2006) describe information behaviour as an integrated process of information seeking, foraging, sense-making, information searching, information organising, and information use on single or multiple topics. Spink et al (2007) refer to the human ability to handle the demands of multiple information tasks concurrently as multitasking information behaviour, a term that has also been used by Given and Leckie (2003), Lee (2003) and Foster (2006). According to Spink et al (2007) and Spink, Cole and Waller (2008), multitasking is an essential element which is fundamental to our understanding of information behaviour and made obligatory by the complexity of the information environment and the information systems that exist thereof.

Spink, Ozmutlu and Ozmutlu (2002) aimed to determine the prevalence of multitasking information seeking and searching behaviours during web, online database, and university library search sessions by using data from four separate studies. They revealed that the complexity of the work and the availability of information and communication technologies and information retrieval systems provided unavoidable opportunities for people to engage in multitasking information behaviours (Spink, Ozmutlu and Ozmutlu 2002). This is supported by Appelbaum, Marchionni and Fernandez (2008) who reviewed empirical research on multitasking behaviour and added that organisations are structured in such a way as to maximise the benefits of information and communication technologies and hence require the employees to multitask in the course

of their work in order to be more productive or efficient and respond to the increasing demands from customers.

Pashler (2000) presented two types of multitasking behaviour. Task-switching is switching back and forth between multiple and different work tasks whereas multitask performance involves performing more than one task simultaneously. These two types of multitasking behaviour are in agreement with Salvucci, Taatgen and Borst's (2009) notion of sequential multitasking (equivalent to task switching) and concurrent multitasking (equivalent to multitask performance) as shown in their multitasking continuum in figure 2.8.
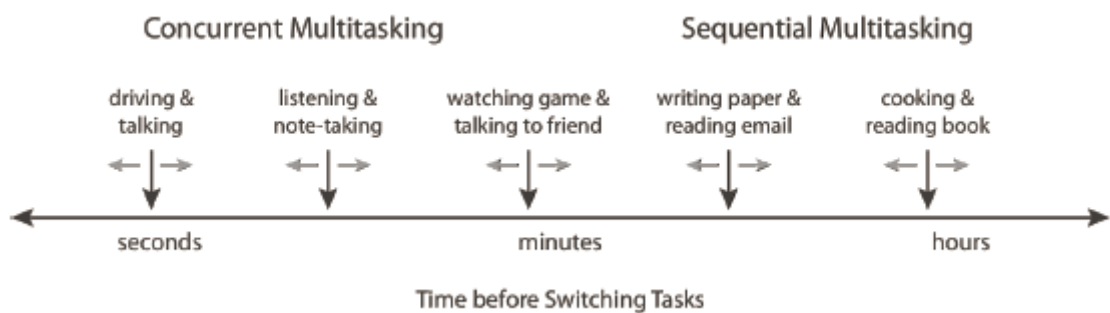
Figure 2.8 The multitasking continuum

(Salvucci, Taatgen and Borst 2009, p. 1820) (© Association for Computing Machinery, Inc. Reprinted by permission)

The multitasking continuum depicts two types of multitasking in their everyday life context. Concurrent multitasking (for example, driving whilst talking) is shown on the left hand side of the continuum with time between switching of tasks lasting up to seconds whereas the sequential multitasking (for example cooking and reading a book) on the right-hand side of the continuum depicts time between switching of tasks lasting up to hours. Salvucci, Taatgen and Borst (2009) explain that the sequential multitasking activities involve people switching tasks, being interrupted and resuming tasks. Salvucci, Taatgen and Borst's (2009) concurrent and sequential multitasking are, in turn, in agreement with Waller's (1996) notions of time swapping (equivalent to sequential) and time sharing (equivalent to concurrent).

Appelbaum, Marchionni and Fernandez (2008), in their review of empirical multitasking research, argue that there is disagreement among researchers as to whether or not a task switcher is more efficient than a dual task performer (or multitask performer). Appelbaum,

Marchionni and Fernandez (2008) came to a view that when once an individual becomes skilled in multitask or dual task performance, the decrease in individual performance when compared with a task switcher is small. This view of multitask or dual task performance being dependent on the individuals skills and experience of multitasking is supported by Lee and Taatgen (2002). Appelbaum, Marchionni and Fernandez (2008) also argue that, while multitasking information behaviour may result in decreased individual performance, it leads to increased organisational productivity.

Spink (2004) identified a gap in the multitasking information behaviour literature and stated that information behaviour models tended to be limited to single information task processes. Spink (2004) presented the results of her case study of an information seeker in a library setting using mixed data collection methods – interviews, observations and diary – and contributing to the understanding of how an information seeker engages in multitasking information behaviour. For making generalisations, Spink's (2004) study had one weak point in that the focus was on a single case – a volunteer information seeker who was an acquaintance of the inquirer. However, the findings that described the process of iterative task switching and multitasking behaviour were similar to findings of other inquiries by Spink, Ozmutlu and Ozmutlu (2002), Spink et al (a, b), Foster and Ford (2003) and Spink et al (2007) that involved more research participants. Spink (2004) concluded that further studies on multitasking information behaviour are required in order to improve the development of theories and models of information behaviour as well as "information professional and user training, and the design of libraries and information services" (Spink 2004, p. 339).

Spink et al (2007) used diary questionnaires to determine multitasking information behaviours of 96 Pittsburgh public library users. They found that 63.5% of the participants were multitasking on more than one topic and that task-switching between information and non-information tasks was variable depending on the time pressure the participant was under. The tasks included internet searching, library browsing, reading, returning and checking out, emailing, printing and financial transactions (Spink et al 2007). The connection between time pressure on individuals and the effects on the task switching is also supported by Waller, Zellmer-Bruhn and Giambatista (2002).

Spink, Cole and Waller (2008) highlighted the changes in the dorsolateral prefrontal cortex of the brain that provide some reasons for the decreased ability to multitask as people get older. The age-related effects on multitasking are also supported by Kramer, Hahn and Gopher's (1999) experiments on 20 young and 20 old adults which showed that, although the younger adults coped better with multitasking, with practice, the abilities were the same. This is in close agreement with Bherer et al's (2005) empirical study of

age-related deficits in multitasking which showed that practice can significantly improve the dual-task processing skills of older adults.

Other studies have found a relationship between ageing and dual-task performance. Examples include Verhaeghen et al's (2003) meta-analysis of 63 studies and McDowd and Craik's (1988) experiments that compared young and old adults' task performance. The issue with the studies is that there was lack of consistency of defining the age group to which an older adult belongs.

2.4.1.4 Collaborating and sharing

"Information workers engage in collaborations with others for almost every aspect of their working lives" (Meloche and Dalton 2011, p. 1). Reddy and Jansen (2008), Hyldegard (2006) and Prekop (2002) explain that information behaviour is commonly perceived and modelled by information scientists as comprising individual processes and does not highlight its collaborative dimension. Reddy and Jansen (2008) refer to the individual dimension of the information behaviour as individual information behaviour (IIB) and the collaborative dimension as collaborative information behaviour (CIB).

There are a number of collaborative information behaviour studies that are beginning to emerge in domains such as healthcare (Reddy and Jansen 2008, Gorman et al 2000, Forsythe et al 1992), education (Capra, Sams and Seligson 2011, Hyldegard 2006, Spence et al 2005, Steinerová and Šušol 2007), military (Sonnenwald and Pierce 2000, Prekop 2002), social intelligence (Davenport 2000, Karamuftuoglu 1998) and IT/design (Saleh and Large 2010, Bruce et al 2003, Fidel et al 2004, Hertzum 2002, Poltrock et al 2003). Other authors have argued that some information activities can occur by working collaboratively such as browsing (Twidale, Nichols and Paice 1997, Lieberman, van Dyke and Vivacqua 1999) and seeking (Schmidt and Bannon 1992, Foster 2006) and yet others have developed models of collaborative information behaviour such as Saleh's (2010) model of information practice of design engineering students that depicts the librarian as a learning facilitator.

Reddy and Jansen (2008) argue that CIB is still relatively new in the information sciences field and it differs from IIB "with respect to how individuals interact with each other, the complexity of information need and the role of information technology" (p. 256). They carried out an empirical study of two healthcare teams to develop a model of collaborative information behaviour and identified specific triggers that can cause a shift from IIB to CIB within Wilson's (2000) three hierarchies of information behaviour, seeking and searching. Reddy and Jansen (2008) embarked on ethnographic field studies comprising interviewing and observation methods of data collection but concluded that a mixed

methods approach comprising quantitative and qualitative elements would have provided better insights info CIB activities. According to Reddy and Jansen (2008), the triggers that cause the shift to CIB are (i) complex nature of information need, (ii) unavailability of information resources, (iii) difficulty in accessing information and (iv) expertise shortage. These triggers are supported by Shah (2010) who sought to understand people's collaborative information seeking behaviour by purposefully interviewing 11 LIS students and staff. The questions were based on situations that got them collaborating and Shah (2010) concluded that 3 major types of collaborations were (i) forced collaboration because it is an essential requirement or routine of the work process, (ii) peer-to-peer collaboration with a view to taping ideas from peers or co-authoring reports and (iii) expert-novice asymmetric collaboration because one party, an expert on a particular subject, is asked to contribute to the work or project. In collaborative information behaviour, actors work together but, while they work on a common object, they may or may not share the same objectives (Bao and Bouthillier 2007).

According to Reddy and Jansen (2008), CIB is supported by systems that enable collaborators to see (e.g. video conferencing), chat (e.g. telephoning or teleconferencing) or become aware of one another's' presence irrespective of the geographical distance between them (e.g. shared calendar access). Spence et al (2005) found that researchers used a variety of tools ranging from email to video-conferencing to support their collaboration during information-seeking activities.

Prekop (2002) used a grounded theory approach to determine the context, information seeking roles and information seeking patterns that become apparent as a result of the collaborative information seeking activities of members of the command and control capability of the Australian defence force. Prekop (2002) used structured interviews for 5 participants and analysed the minutes of 40 working groups. The total number of participants involved in the study was 28. Prekop (2002) found that the contexts were information seeking and organisational. The roles were information gatherer, referrer, verifier, seeking instigator, indexer/abstracter, administrator and manager. The information seeking patterns described "prototypical actions, interactions and behaviours performed by participants adopting any of the roles" (Prekop 2002, p. 543). The patterns were information seeking by recommendation, direct questioning, and providing paths for seeking information. Prekop's (2002) study was focused on the information seeking environment.

Another study that followed this same route by focussing on the information seeking stage is Spence et al's (2005) online survey of 150 academic researchers to (i) determine the most important trigger of collaborative information behaviours which was lack of expertise

when compared with 2 other triggers - inaccessible information and complex information need, (ii) categorise collaborative media or channel which were traditional (emailing, face-to-face and telephone), web, fax and electronic forum, and (iii) confirm the value of collaborative information seeking activities when compared with individual seeking activities.

Collaborative information behaviour is defined as "the totality of behaviour exhibited when people work together to identify an information need, retrieve, seek and share information, evaluate, synthesize and make sense of the found information, and then utilize the found information" (Karunakaran, Spence and Reddy 2010, p. 2). Karunakaran, Spence and Reddy (2010) qualify this definition with the statement that all the activities in the definition need not necessarily be present for the behaviour to be defined as collaborative information behaviour. They presented an early model of information behaviour which depicts behaviour beyond the seeking stage to include not only problem identification and information seeking, but also information use which comprises sharing, comparing, and evaluating micro-behaviours. One limitation of this model is that the collaborative elements of information use were not explored in greater depth. Unlike Karunakaran, Spence and Reddy's (2010) model which, at least, attempted to address the 'totality of behaviour' as indicated in their definition, Yue and He (2010) presented a model of collaborative information behaviour model which was seeker-centric by conducting a pilot study of 3 participants who were provided with a search (email explorer) and two collaborative tools (Skype and wiki) and their e-discovery experiences captured by via focus group and post-task questionnaire. Yue and He (2010) found 3 stages of collaborative information seeking which were (i) exploration of task and strategy formulation, (ii) allocation of sub-tasks and (iii) combining the results of the sub-tasks to form a final result. When sub-tasks were allocated, individual information behaviour then kicked in. The limitation of this model is that it was based on the views of only 3 participants in a pilot study.

When actors engage in collaborative information behaviour, there may be a need to engage in activities that aim to minimise complexity and uncertainty and thereby increase clarity and decrease confusion (Ntuen et al 2006). This is referred to as collaborative sensemaking which occurs when a group of actors engage in the process of understanding messy information or unfamiliar situations in a particular context (Umpathy 2010, Paul et al 2007). Dervin (1998) goes on further to argue that there is a connection between sensemaking and knowledge management and states that, when sense is made of various situations, questions and outcomes, knowledge is then created.   However, "sense making mandates attention not only to the material embodiment of knowing, but to the emotional/feeling framings of knowing as well" (Dervin 1998, p.42). Paul et al (2007)

ran 7 focus groups comprising hospital emergency department physicians to determine that healthcare personnel preferred communication tools such as phone and paper rather than computer supported information tools such as electronic medical records for engaging in collaborative sensemaking. This preference arose as a result of the opportunity for using language in a natural, unstructured way and the real-time discussion opportunities that exist in communication tools which support Dervin's (1998) emotional aspects in sensemaking.

Collaborative information behaviour and information sharing behaviour are inextricably linked. Information sharing is an encompassing term that "covers a wide range of collaboration behaviors from sharing accidentally encountered information to collaborative query and retrieval" (Talja 2002, p. 145) whereas collaborative information behaviour according to Talja and Hansen (2006, p. 114) is "an activity where two or more actors communicate to identify information for accomplishing a task or solving a problem", which is similar to Karunakaran, Spence and Reddy's (2010) definition. Talja (2002) used semi-structured interviews to understand information sharing practices (which included gathering information on information seeking and collaboration activities) of 44 Finnish university academics across the disciplines of history, nursing science, literature and environmental science. The findings in Talja (2002) revealed 5 types of sharing activities:

- Strategic sharing: sharing of information about the content of documents and writing collaboratively in a research environment designed for sharing information
- Paradigmatic sharing: sharing of the same concerns and engaging in interpreting, filtering, and collaborative information seeking in order to achieve a goal
- Directive sharing: a 2-way process in which 2 academics, one of whom is more experienced, share the findings of each other's information seeking activities, while striving to achieve the same goal
- Social sharing: sharing of information obtained serendipitously and the actors involved do not necessarily have the same goals.
- Non-sharing: this is a rare occurrence when sharing is not possible for several reasons such as one party being the only person who can perform an information task due to their expertise (Talja 2002).

The limitation of Talja's (2002) classification of information sharing types is that it is difficult to draw a well-defined boundary between strategic, paradigmatic and directive sharing because there are overlaps in their descriptions especially as the actors involved have the same concerns and goals. Fidel et al (2000, 2004) used the term 'collaborative information retrieval' (CIR) to refer to the collaborations that take place between two colleagues as they gather information.

Li et al (2007) hypothesised that each of 3 Chinese cultural factors – collectivism, Confucian dynamism and guanxi – positively influence information sharing behaviour. In analysing 207 completed responses to a survey instrument and carrying out structural equation modelling to test the hypotheses, Li et al (2007) found that all 3 of their hypotheses were confirmed for information sharing within the same division in the organisation. Li et al (2007) also found that none of the hypotheses were confirmed for information sharing with people outside the organisation. However, Li et al (2007) noted a sample bias towards the under 30-year age group and admitted that too many cultures exist in Chinese society for there to be general statements about cultural influences based on the study. However, the study is important because it shows that the culture of the workforce is an important variable that should not be overlooked by managers who attempt to understand their employees' information behaviour.

Li et al's (2007) study can be contrasted to Drake, Steckler and Koch's (2004) study which resulted in the development of a conceptual framework to illustrate the influence of 3 subcultures – scientist, politician and bureaucrat – on information sharing within and across 3 government agencies. Drake, Steckler and Koch (2004) argued that, with information sharing being critical for decision making, the lack of understanding and trust, together with different needs, interests and perspectives of information between subcultures can impede information sharing in an organisation. It is unclear in the study why the 3 specific subcultures emerged even though it was briefly stated that theoretical sampling was used "to identify a cross-section of key informants" (Drake, Steckler and Koch 2004, p. 69) across the 3 US departments of agriculture, land management and fish and wildlife. However, a key valuable implication for research revealed by the study is that "exploration of the value chain concept, the examination of what value is added or subtracted at each stage of creation of a product or service, shows promise as a way to study information-sharing issues and challenges within the public sector" (Drake, Steckler and Koch 2004, p. 82). He, Zhao and Hinds (2010) carried out a survey of 13 American and 13 Chinese respondents from a global IT company to determine cross-cultural information sharing differences. Although the study did not explain how the respondents were recruited, He, Zhao and Hinds (2010) showed that the Chinese respondents were willing to share more information with strangers than their American counterparts would with strangers. Whereas the Americans would equally share information with their close friends and close family, the Chinese respondents were more willing to share information with close friends than with close family.

Gender has been identified in O'Daniel and Rosenstein (2008) and Fagin and Garelick (2004) to be one of the barriers to collaborative working between healthcare

professionals. Researchers such as Gefen and Straub (1997) and Taylor (2004) have shown that there are gender influences on information sharing. Taylor (2004) surveyed 212 software developers to find that men tend to make more use of knowledge management systems for knowledge acquisition and sharing than women. Steinerová and Šušol (2007) collected data from 793 respondents to a survey of academic library users' perceptions of information seeking. They found that, whereas men had a preference for individual information seeking, women had a preference for collaborative information seeking.

Information sharing modes were identified in Pilerot and Limberg's (2011) semi-structured interviews with 7 design scholars. The sharing modes were receiving and sending emails, telephone and face-to-face conversations, collaborative writing and reading, and receiving documents and articles from work colleagues. This study is important because it presents information sharing modes which may or may not be found to exist in ISD.

Bao and Bouthillier (2007) proposed a definition of information sharing behaviour and linked it to other conceptions of information behaviour. Bao and Bouthillier (2007) explained that when the actors work together to achieve transfer of information from the provider to the seeker, this is known as information sharing behaviour. Tajla (2002) used the term information giving to describe the one-way sharing of information between 2 actors in which the more experienced actor passes on valuable information to a less experienced actor. It could therefore be argued that one actor gets information from the other, having been given the information by the other actor.

This review of collaborative and sharing behaviours has evidenced that they do not only occur during information seeking but during other information behaviours as well and that people choose whether or not to engage in collaborative and sharing behaviours. These points are important to note for the present study which aims to determine the information behaviour of an information provider.

2.4.1.5 Information use

Savolainen (2009) explains that the term *information use* is frequently used in library and information science literature, especially within the phrase, *information seeking and use*, and rarely explained and developed but the underlying assumption is that it starts after information is sought. This assumption is problematic and Bouazza (1989) confirmed this confusion in depictions of the term many years ago in his article on information user studies. The implication that *use* occurs after information is sought is contrary to the approach taken by a number of scholars. For example, Kari (2010), in his exploration of the diverse interpretations of the term *information use* via a review of a wide range

literature drawn from eminent library and information science scholars, found that information use can be conceptualised as:

- Information practices – the customary ways of interacting with information by engaging in acts such as approaching sources of information, reading, thinking, and internalising, decoding, interpreting, evaluating, adopting, consuming, searching for, retrieving, creating, storing, sharing information
- Information search – choosing, approaching and looking for information sources while using, in some cases, technological tools to facilitate the process
- Information processing – the stage that immediately follows the seeking and finding stages which includes analysing, modifying, internalising, watching, feeling, and interpreting information.
- Knowledge construction - this includes making and unmaking meanings, developing new conceptions, incorporating pieces of information into one's knowledge structure, construing information, and bridging a knowledge gap and creating a new meaning.
- Information production – this is about engaging in processes that create an external expression of knowledge which include packaging, bringing together pieces of information, sharing information, and facilitating the flow of information.
- Applying information – this includes implementing, putting to work, putting into action, making decisions and solving problems.
- Effects of information – this is about the information or non-information changes that occur as a result of information and which could be internal or external to the person and may include policy decisions and increase in personal confidence. (Kari 2010)

Kari's (2010) conceptualisation of *information use* as knowledge construction can be captured in Brookes' equation $K [S] + \Delta I = K [S + \Delta S]$ (Brookes 1980, p.131). In this pseudo-mathematical equation, when an increment of information (ΔI) is added to a person's existing knowledge structure ($K[S]$), it results in a person's altered or changed knowledge structure ($K [S + \Delta S]$) where ΔS is the effect of the increment of information and the equal sign (=) depicts "equilibrium rather than equality" (Todd 1999, p. 858). Therefore, information is used for knowledge construction by changing one's knowledge structure. Todd (2006) carried out a qualitative survey of 574 students to identify changes in knowledge as a result of being engaged in a guided enquiry project in a library. Amongst the findings, Todd (2006) identified an additive approach (addition of new facts) and an integrative approach (addition and manipulation of new facts) to knowledge construction which support the right hand side of Brookes Equation.

Todd (1999), in an earlier paper, had posited Brookes' equation as the theoretical framework for furthering our understanding of the cognitive dimension of information use, that is, the changes in thinking that occur when people interact with information. Todd (1999) identified questions that emerge from Brookes' equation which are still valid ever since Brookes published the equation in 1980. The questions include what people's perceptions are of the cognitive effects of interacting with information and this, together with Bawden's (2011) assertion that Brookes' equation is the basis for qualitatively characterising information behaviour, make the concept of *information use* relevant to the present study.

The term *information use* has been found to be subjective and Choo et al (2006) warn that an individual, having encountered information, will not find all of the encountered information of much use. Choo et al (2006) use the term *information use outcome* in their conceptual framework of information management, information culture and information use outcomes because they assert that *information use* "involves the selection and processing of information in order to answer a question, solve a problem, make decision, negotiate a position or make sense of a situation" (Choo et al 2006, p. 495) which is captured in Kari's (2010) findings of the various conceptions of information use. The problem with the word *use* has also been highlighted by Menou (1995a) who, in his analysis of a study which aimed to determine the benefits of information activities to developing countries, stated that most users struggle to respond when asked open questions about the usefulness of information. Menou (1995a) goes on to state that "people do not use information; they just take care of their business" (p. 467). *Information use* is a fundamental concept in library and information science and, despite this, "there are no definitional or methodological approaches that are broadly accepted or applied" (Choo et al 2008, p. 794).

What is evidenced in this review of the concept of *information use* is that it is a very broad concept which is experienced in every aspect of people's interactions with their environment and that no single scholar of library and information science has presented a definitive definition of this complex phenomenon. The present study takes the view that the term is too broad to be used as an adjunct to information seeking because the evidence seems to show that it takes place during the process of information seeking behaviour as well as during other modes of information behaviour.

2.4.1.6 Emerging questions

There are many questions generated from the concept of information behaviour in the literature in this section that have influenced the development of this study. Gaps in the literature include more high level information behaviours other than information seeking,

and categorisation of low level information behaviours or activities. Questions that have emerged from the literature so far include: What kind of information behaviours exist in the study context? Are they individual information behaviours or collaborative information behaviours? Are there more than the three Wilson's (2000) hierarchies of information behaviours, seeking and searching? What are the lower-level behaviours or information activities that are at the same level as Wilson's lower hierarchies? How are the information seeking, multitasking and collaborative behaviours of information providers categorised? How do information providers experience multitasking and collaborative information behaviours? What are the culture, age, experience, personality and gender influences on multitasking, collaborative and other information behaviours of providers?

2.4.2 Approaches to categorising information behaviour literature

Within information behaviour literature, there is a "bewildering array of topics, populations, samples, sites, theories and methods" (Case 2006, p. 295). Case (2007) makes a compelling argument for categorising the information behaviour literature into demographic group, social role and occupation. The present study adopts these categories in reviewing some of the available literature. The subjects of extant information behaviour studies on social role include students, prisoners, tourists, web users, and library users (information consumers). Demographic group examples include gender, sexual orientation, ethnicity, social class, age, personality and disability. Occupational group examples include healthcare professionals, academics, entrepreneurs, scientists, engineers, journalists, information professionals, managers, politicians, public and civil servants, artisans, auditors, securities analysts and many more. The occupational context represents, by far, the widest area explored by information behaviour researchers and, while literature on the social role and demographic groups will be reviewed here, the occupational groups will receive more discussion because they are more relevant to the participants of the present study who are categorised as belonging to an occupational group.

2.4.2.1 Social role

Research on students comprises the greatest number of studies of information behaviour by social role. However, the type of information behaviour that the studies predominantly focus on is information seeking behaviour. Researchers such as Stokes and Urquhart (2011), Rowlands and Nicholas (2008), Bronstein (2007), Makri, Blandford and Cox (2006), Nicholas, Huntington and Jamali (2007), Pinto and Sales (2007), Sadler and Given (2007), George et al (2006), Makani and Wooshue (2006), Barrett (2005), Callinan (2005), Boadi and Letsolo (2004), Kerins, Madden and Fulton (2004), Fescemyer (2000) and Fidzani (1998) have used interviews, observations, task-based explorations, survey

questionnaires, focus groups, case studies, or mixed methods to determine the information seeking behaviour of students.

Other literature on information seeking behaviour of students include the review of literature on the learning styles of students (Weiler 2005), log analysis of universities' online journal system to track and map students' information seeking behaviour (Nicholas, Huntington and Jamali 2007), the application of Ellis' model to scholars' information seeking behaviour for determining the correlation between information strategy and stage of research (Bronstein 2007), and exploring students' cognitive and affective experiences as well as information seeking behaviour while preparing an assignment (Hyldegard and Ingwersen 2007).

Makri and Warwick (2010) carried out naturalistic observations of, and gathered think-aloud data from, 9 architectural students to determine how they find, interpret and use information for their academic work. Makri and Warwick (2010) found that the high- and low-level information behaviours were finding (that is, accessing, searching, browsing, encountering, surveying, monitoring, exploring and chaining), assessing (that is, selecting and distinguishing), interpreting (that is, analysing, synthesising, visualising and appropriating), using (that is, editing and recording) and communicating (that is, consulting, sharing and distributing). These information behaviours have implications for the present study especially as Makri and Warwick's (2010) study describes information behaviours that also take place after the information has been found.

Campbell (2005) used Wilson's (2005) revised general model of information seeking behaviour to demonstrate the significance of information behaviour of prisoners. Campbell (2005) argued that prisoners represent a group of people who are under a lot of stress and his paper focussed on prisoners' information seeking behaviour.

Tourists' information seeking is an emerging area of information behaviour. Gursoy and Umbrelt (2004) gathered empirical evidence to demonstrate the influence of culture on external information search behaviour of 3,624 travellers from the European Union member states, a study similar to Gursoy and Chen's (2000) investigation of German, French and British travellers' information search behaviour. Snepenger et al (1990) studied the information search strategies of destination-naïve tourists.

The literature on web users' online information behaviour has been growing in recent years. Huang et al (2007) gathered online data of 2,022 web users and showed that their width (categories of sites), length (sites visited per category) and depth (pages downloaded per site) of online behaviour are highly correlated, while Banwell and

Gannon-Leary (2000) predicted and monitored the information seeking behaviour of academics and students in relation to web-based information services.

Other areas of research within the social role subject domain include information consumer/library users (Nicholas et al 2003, Steinerová and Šušol 2005), individuals' everyday life information seeking behaviour using diary and critical incident interview with 1 participant (Julien and Michels 2004) and a study of the information behaviour of 12 knitters using semi-structured interviews and observations (Prigoda and McKenzie's (2007).

Much of the focus of all the above literature is on information users who are not part of those that provide the information. These end users are referred to as external users in the present study because they are external to the information provider and this distinguishes them from the end-users who are internal to the information provider. The term information behaviour in the above literature, more often than not, is actually referring to information seeking behaviour. While these studies are different from the present study, the strengths of approaches to information seeking, including the cognitive and affective domain considerations are valuable for informing the present study's approach.

2.4.2.2 Demographic group

This section outlines the range of studies about actors' information behaviour and their demographic characteristics which include gender, age, experience, sexuality, personality, culture, disability and race that have implications for the present study.

Urquhart and Yeoman (2010) state that many information behaviour studies merely consider gender as a demographic variable and do not investigate male and female differences in information behaviour. However, Hupfer and Detlor (2006) caveat traditional stereotypic male and female sex differences in role and behaviour with the fact that, in these modern times, such differences are becoming blurred and insignificant and what matters is individuals' self-descriptions of their gender identity. Recent gender studies have been carried out that show differences in information search behaviour between males and females (Kim, Lehto and Morrison 2007) and gender differences in personality, collaborative behaviours and feelings (Steinerová and Šušol 2007). Kim, Lehto and Morrison (2007), analysed data from 1334 respondents to an internet tourism and travel survey to conclude that women tend to engage in online information search activities more thoroughly and comprehensively and make more use of related online information than men. The survey comprised questions on demographic characteristics (age, education, income and employment), trip behaviours on a 4-point Likert scale,

attitudes towards website features (interactive features, search features and information scope) and visits to 3 related websites on a 3-point Likert scale. Kim, Lehto and Morrison's (2007) study can be contrasted with Laroche et al's (2000) study of 364 respondents to a questionnaire designed to capture differences in the way males and females search for Christmas gifts. Using regression analysis, Laroche et al (2000) also found that women are more thorough and comprehensive in their search strategies but warned that, with increasing blurring of gender roles in households particularly with more women in full-time employment, other studies have shown that there are negligible information seeking behaviour differences between working women and men. Examples of such studies that show no significant gender differences in information seeking behaviour (e.g. Knight and Pearson 2005, Larner 2006) are described in Urquhart and Yeoman's (2010) development of a framework to categorise information seeking behaviour research in which they stated that it is generally in studies with larger samples of participants that gender differences in information seeking behaviour tend to become apparent. These studies are important to the present study because the research questions which influence the size of the study which, in turn, may influence the associations between gender and information behaviour, will help further the understanding of the findings that will emerge from the present study.

Steinerová and Šušol (2007) found, in their survey of users of Slovak academic libraries, that women display a lot of patience while seeking information, whereas men tend to employ faster methods of retrieving information. They also reported that men had a more optimistic and assertive attitude to searching because a greater number of men stated that the results of the search confirmed what they knew prior to commencing the search activity and they were, by far, more satisfied with their search results. In the same study, Steinerová and Šušol (2007) attempted to link personality with gender in relation to information seeking. Depending on the responses to some of the questions, Steinerová and Šušol (2007) classed the respondents as type A personality (those who use different information sources and spend time critically evaluating the information and cope well with uncertainty), type S personality (those who are advocates of technologies that support quick access to search results, make decisions on search results quickly and may become anxious due to information overload), and type M personality (mixed A and S types). Steinerová and Šušol (2007) could not find a statistically significant difference between personality types for men and women. The study relied heavily on statistical methods and Steinerová and Šušol (2007) noted in their discussion that it is important for quantitative methods to be supplemented with qualitative methods of evidence gathering in order to get a better picture of information behaviour. It was also noted that gender and personality are only two of the numerous factors that have an impact on information behaviour and this is of particular relevance to the present study. Steinerová and Šušol's

(2007) constructions of personality based on the answers to some questions in a survey for understanding gender differences in information seeking without engaging in personality testing of respondents may not be able to provide a complete picture of the influences of personality and gender on information seeking. Their study can be contrasted with Hyldegård's (2009a) study of the relationship between personality and information behaviour of 10 graduate students. Hyldegård (2009a) used a validated personality test, the NEO Personality Inventory Revised (Costa and McCrae 1992), that comprised 240 statements to determine the personality of the respondents. The personality test results were then made available to the study participants for debriefing and feedback. The affective experiences of information seeking were captured using a Likert-scale questionnaire comprising questions about feelings. Diaries were used to capture the range of information activities and affective responses. Semi-structured interviews were then used to capture the participants' perceptions and experiences of information activities and use of information sources. Hyldegard (2009a) emphasised the value of supplementing hard data collection with soft data collection by explaining that it was possible to gain further insights into the participants' information behaviour in context. The study was weighted towards information seeking behaviour and affective experiences to the detriment of non-seeking type information behaviours even though the aim of the study posited that an understanding of participants' personality and information behaviour was being sought. Halder, Roy and Chakraborty (2010) also used Costa and McCrae's (1992) revised personality inventory, as did Heinström (2003), to determine relationships between personality and information seeking behaviour. Stokes and Urquhart (2011) used concurrent mixed methods on 261 nursing students to determine their profile of information seeking behaviour. Personality assessment of the students was carried out by Stokes and Urquhart (2011) using the pre-validated Mini-markers assessment tool (Saucier's 1994) but tools for assessing learning styles and self-efficacy were also used. Stokes and Urquhart (2011) refer to the activities of information behaviour as micro-processes.

More gender studies include Wathen and Harris' (2006) study of 40 women in rural Ontario to determine their health information seeking behaviour and Hamer's (2003) identification of the information needs and information seeking activities connected to coming-out of gay males by interviewing 8 volunteers. Wathen and Harris (2006) embarked on a study of the health information seeking behaviours of rural Canadian women who are more often than not the primary health information seekers for themselves and their family and who find the overload and complexity of online health information overwhelming. Interviews took place with 40 respondents and themes were developed from the transcribed interviews within an NVivo software environment. They found that the challenges of living in rural areas which are not well serviced medically

resulted in women seeking sources of information such as family and friends and the women tended to be very self-reliant. The paper showed that the rural context of the study participants influenced greatly their information seeking perspectives. Hamer's (2003) critical incident interviews of 8 gay men focussed on the participants' context of coming-out. The transcripts of the interviews were thematically analysed using content analysis. Hamer's (2003) study found that the participants' context of coming-out greatly influenced their information seeking behaviour in that they experienced fear and concealed their seeking activities because of their perceived consequences of being found out. The issue of context is relevant to the present study in that the context of information provider is a key element in the research problem.

Several studies exist that focus on the information seeking behaviour of individuals according to their ethnicity. Examples include Abdoulaye's (2002) determination of sources of information and the perception of the library effects of information behaviour by interviewing 20 African students in Malaysia, Fisher et al's (2004) mixed methods study of migrant Hispanic farm workers who were experiencing information poverty, Garcia-Cosavalente, Wood and Obregon's (2010) questionnaire survey of 100 Peruvians to determine their health information seeking behaviour and Courtright's (2005) study of health-related information seeking of both purposive and accidental encountering sub-types among 7 Latino newcomers to a US city using critical incident and episodic interviewing techniques. Pálsdóttir (2008) investigated the information behaviour in relation to health and lifestyle of 508 Icelandic citizens in order to show a relationship between sex, education, information seeking style and usefulness of information using cluster analysis to determine information seeking clusters. Morey (2007) carried out a telephone questionnaire survey of 216 African-American residents of Buffalo, New York, to explore their health information seeking behaviour. Morey (2007) found that the older residents tended to consult health care professionals as compared to the younger residents who used the internet but there were no statistically significant differences between male and female choice of information source. Ross et al (2011) also carried out a telephone questionnaire survey of 268 African-American men without a diagnosis of prostate cancer to determine their prostate cancer knowledge and information acquisition patterns. While studies related to ethnicity do not have implications for the present study due to the very small proportion of population of the present study that belongs to a different ethnic group, the methods used are useful in informing the choice of methods employed as discussed in the methodology chapter.

Some studies have focussed on populations belonging to low socio-economic groups. Examples are Knight's (2005) examination of Information search behaviour of low income and disadvantaged African Americans using existing information seeking behaviour

models and Sonnenwald, Wildemuth and Harmon's (2001) critical incident technique interviewing of 11 undergraduate African-American students in an economically depressed area in the United States to determine their information horizon in information seeking situations.

Bilal and Kirby (2002) used mixed methods – observations, structured interviews, personal diaries – to determine similarities and differences in information seeking behaviour during the use of a search engine amongst 22 middle school students and 9 university graduate students. Bilal and Kirby (2002) found that information seeking behaviours were not influenced by age but, rather, the abilities to focus, navigate effectively and recover from unsuccessful keyword search sessions. The study had problems with sample representativeness of the population. The study can be contrasted with Shenton and Dixon's (2004) research which found that the information seeking behaviours of those aged 13-18 years are more sophisticated than those aged 9-13 years and 4-9 years especially with regard to the older age group's greater use of the internet and information channels. The insights into the information behaviour of 5-18 year olds are captured in Todd's (2003) overview of their information seeking and use and the implications for school librarians and the design of information services. Todd (2003) stated that the themes that emerged from the literature indicated that children and adolescents experienced information overload and difficulties in managing and filtering the plethora of information that they engaged with. Todd (2003) added that the subjects oftentimes wanted to seek answers to their doubts and opinions and therefore needed to engage with information professionals who would understand their needs from the cognitive, behavioural and affective perspectives. This need to engage with others for help in seeking information is addressed by Shenton and Dixon (2003b) in their individual interviewing and focus group information gathering involving 188 pupils where they found that youngsters' use of others for information seeking was prevalent and effective on one hand and fraught with information credibility issues on the other hand with implications for information services where adults may use other adults as information sources. These empirical studies on youngsters' information seeking behaviour have resulted in models of information seeking behaviour of young people as described in Shenton and Hay-Gibson (2011a,b) and Shenton and Dixon (2003a). A study with age groups that are most relevant to the present study is the Tenopir and Rowland's (2007) empirical study of age-related information behaviour. They surveyed 3,827 students aged 17-21, 22-29, 30-39, 40-49 and >50 years. Among their key findings, Tenopir and Rowland (2007) found an association between increasing age and preference for use of print sources than electronic sources, and the high dependency on Google as a search engine by the younger students. While the age-related studies of information seeking behaviour are relevant to the present study with regard to experiences of information behaviour in

relation to age profile of research subjects, it is noted that the studies are all seeker-centric and do not address other forms of information behaviour.

Beverley, Bath and Barber (2007) used semi-structured interviews of 31 visually impaired people to explain their information behaviour while seeking health and social care information. Beverley, Bath and Barber (2007) used two models of information behaviour (Wilson 1999b, Moore 2002) as the framework for analysis and interpretation of findings and confirmed that Moore's (2002) model helped explain the information needs of the visually impaired participants whereas Wilson's (2002) model helped explain the information seeking behaviours but failed to provide a variable for capturing the participants' personal health characteristics. While the study stated that determination of information behaviour was the aim of the study, on closer reading, the study was predominantly based around information seeking behaviour and information needs. Sahib, Tombros and Stockman (2012), on the other hand, stated from the outset that their observational study was about comparing the information search behaviour of 15 sighted and 15 non-sighted searchers and they found, among other things, that visually impaired searchers formulated their search queries more precisely and that they managed their found information better than sighted searchers. However, the sighted searchers were more aware of search support features and therefore used these features more frequently and they viewed more of the search results and accessed more external sites. Bilal (2010) explored the digital information landscape of children on the autistic spectrum using their mediators who interact with them. Bilal's (2010) study, similarly, predominantly focussed on information needs and seeking and they found that the parents served as information seeking proxies to the children and teachers ensured that complex information assignments were broken down to reduce anxiety and confusion in the children.

Much of the literature is about external users of information and about information seeking behaviour. However, the demographic influences on information behaviour are important areas for consideration in this study when interviewing people to ascertain their feelings, thoughts, perceptions and behaviour. Work experience has been found to influence information seeking behaviour. Kuhlthau (1999) carried out a 5-year longitudinal single case study on a securities analyst information worker to determine how his years of information work experience affected his information seeking behaviour. Kuhlthau (1999) found that, as information work experience was being gained over the 5-year period, the securities analyst was moving from novice to expert and therefore became less uncertain (that is, anxious and overwhelmed), saw the need to add value to information for his clients, had more opportunities to apply learning from past experience, used experts as information sources less frequently, and interacted more with his information sources.

The richness of the findings support Kuhlthau's (1999) assertion that the case study provides an opportunity to do a quantitative survey of information workers in order to provide a more complete understanding of the effects of experience on information seeking behaviour. The findings by Kuhlthau (1999) provide insights into the role of individual characteristics in the study of information behaviour.

Inferences from demographic influences on information behaviour should be stated with caution. Niu and Hemminger (2012), in their survey of 2063 academic scientists across American universities found that while academic position influenced information seeking behaviour the most, one limitation of such a survey is that there are hidden factors that may influence academic scientists' information seeking behaviour such as being in receipt of training several years earlier which would not be captured in a questionnaire but may influence information seeking behaviours several years later. This caveat is useful for the present study in that it creates an awareness of influences of unknown factors when discussing the findings of demographic variables on information behaviour.

2.4.2.3 Occupation

The literature on occupational groups is very extensive and can be divided into the following subgroups: healthcare workers, scientists, university staff, engineers and planners, managers and entrepreneurs, accountants and auditors, information providers, and others. Table 2.2 summarises a selection of the literature, ordered by occupational group of the subjects under study. This is followed by a more comprehensive examination of the literature.

Table 2.2 Selected information behaviour studies on occupational groups

Author(s)	Activity/ behaviour	Data collection methods	Occupation and number of subjects	Relevance to present study
D'Alessandro, Kreiter and Peterson (2004)	Seeking	Critical incident interviewing.	Paediatricians n=52	Emphasis on information sources. Seeking sub-processes not explored. However, relevant categorisation of information sources presented.
Bryant (2004)	Seeking	Case study (qualitative: interviews, group discussions) (quantitative: data on recorded use of library by doctors)	Family doctors n=19 (interviews) n=39 (group discussions)	Research findings showed preferences of information seeking approaches.
Urquhart et al (2007)	Seeking	Survey questionnaire Interviews	Healthcare professionals n=69 (questionnaire) n=33 (interviews)	The study presented insights into when subjects would consider delegating search activity which depended on work roles and tasks.
Ocheibi and Buba (2003)	Seeking (gathering)	Survey questionnaire	Medical doctors n=158	Results showed preferences for delegating information search activities
Gravois et al (1995)	Seeking	Survey questionnaire	Dental hygienists	The study showed the

Author(s)	Activity/ behaviour	Data collection methods	Occupation and number of subjects	Relevance to present study
			n=44	information seeking preferences in an age when dental hygienists had limited computer skills
McKnight (2007)	Seeking, recording, sharing	Grounded theory approach. Interviews, participant observation	Nurses N=6	The presence of researcher in such a small specialist clinical setting may influence the subjects' behaviour. Valuable insights into nurses' on-duty information interactions.
Musoke (2007)	Information use (value as a driver of information activities)	Grounded theory approach. Interviews (comprising both open and critical incident questioning)	Healthcare providers n=82	Insights into how value of information drives information dissemination activities.
Kostagiolas, Aggelopoulou and Niakas (2011)	Seeking	Survey questionnaire	Hospital pharmacists n=88	One of the objectives of the study was to investigate the subjects' information seeking behaviour. However the study focussed on information needs, sources and accessing obstacles thus providing lessons for ensuring the objectives are clearly stated at the outset.
Meho and Tibbo (2003)	Seeking (accessing, networking, verifying, managing)	Survey questionnaire	Academic social scientists n=60	An extension of Ellis' (1989) model of information seeking behaviour to include 4 new features.
Niu and Hemminger (2012)	Seeking	Survey questionnaire	Academic Scientists n=2063	Recommendation in the conclusion that interviews would provide better understanding of motivation of information seeking behaviour. Findings show academic position as most important influence on information seeking behaviour.
Landry (2006)	Seeking	Interviews	Dentists n=12	Findings show the effect of work roles on choice of information source together with barriers to information seeking.
Ikoja-Odongo and Ocholla (2004)	Seeking, Impact of information use	Critical incident interviewing, observations	Entrepreneurs n=602	Findings included information dissemination preferences and impact of information seeking behaviour.
Majid, Anwar and Eisenschitz (2000)	Needs, Seeking	Mixed (Questionnaire survey, individual interviews)	Scientists n=236 (survey) n=60 (interviews)	Information seeking behaviour is defined as "a broad term encompassing the ways individuals articulate their information needs, seek, evaluate, select, and use the needed information" (p.146). Findings show the importance of information exchange between colleagues.
Zawawi and Majid (2001)	Needs, Seeking	Survey questionnaire	Scientists n=54	Insightful findings about the scientists' information sources and seeking preferences
Hallmark (2003)	Seeking	Survey questionnaire	Scientists n=61	Study presents insights into how scientists access and retrieve

Author(s)	Activity/ behaviour	Data collection methods	Occupation and number of subjects	Relevance to present study
				information for their research
Bigdeli (2007)	Seeking	Survey questionnaire	Engineers n=158	Findings presented motivations and barriers to information seeking
Kwasitsu (2003)	Seeking	Mixed (Survey questionnaire, interviews)	Engineers n=35 (survey) n=4 (in-depth interviews)	Research process well described. Study supports theories of work roles and information seeking behaviour
Mutshewa (2007b)	Searching, gathering, sharing, dissemination, accessing, quality checking	Interviews	Environmental Planners n=10	The study also goes beyond the seeking stage and identifies a range of information activities by the planners.
Robinson (2010)	Giving, receiving, seeking, asking, answering	Brief Survey Questionnaire. Self data entry.	Engineers n=78	Findings showed times spent on a range of information behaviours according to level of seniority.
Anwar, Al-Ansari and Abdullah (2004)	Seeking	Survey questionnaire	Journalists n=92	Findings reveal types of formal and informal information sources used by journalists
Attfield and Dowell (2003)	Initiation, preparation, personal understanding, gathering, seeking, production, storing, checking, reviewing, editing	Grounded theory approach. Interviews	Journalists n=25	Insights into a range of information behaviours by journalists
Diso (2005)	Production, transfer, delivery	Analytical research paper	Journalists	The non-seeking information activities of journalists are described together with the impact they have on society.
Rose (2006)	Monitoring, investigating, communicating, relaying	Observations Interview	Passenger Information officers n=2 (observations) Shift Manager n=1 (interview)	A range of information behaviours of information providers are presented together with insights into how the subjects bring resolution to uncertainty.
Brown and Ortega (2005)	Seeking	Survey questionnaire	Librarians n=72	The most preferred information resources are presented including how experience influences the librarians' information seeking preferences.
Schefcick (2004)	Seeking, searching, omitting, retrieving, interviewing	Observations Interviews	Private investigators n=4 participating investigating agencies. No. of investigators not revealed.	Insights into an occupational group that mainly gather, make sense of, and provide information for clients.
Baldwin and Rice (1997)	Seeking	Telephone survey	Securities analysts n=100	No significant influences of demographic characteristics of subjects on choice of information sources and information dissemination channels.
Jin and Bouthillier (2007)	Monitoring, thinking, online searching, tracing, analysing, editing, auditing, consulting, organising, compiling, providing	Critical incident interviewing, diaries	Competitive intelligence professionals n=4 (interviews) n=3 (diaries)	A range of low-level information behaviours thus giving a better picture of the information world of a competitive information professional

Author(s)	Activity/ behaviour	Data collection methods	Occupation and number of subjects	Relevance to present study
	answers			
Jin and Bouthillier (2008)	Sources, storing, organising, analysing	Interviews, diaries	Competitive intelligence professionals n=28 (interviews) n=15 (diaries)	A lot of focus on information sources but a few post-seeking information behaviours presented in the study
Jogaratnam and Law (2006)	Acquisition	Survey questionnaire	Hospitality and Tourism executives n=181	The practices of scanning the environment for information by hospitality and tourism executives in the process of acquiring information.
Wicks (1999)	Seeking	Mixed (Survey questionnaire, interviews)	Clergy n=378 (survey) n=20 (interviews)	The notion of being open or being closed to sources of information outside the pastors' immediate information handling world.
Liew and Ng (2006)	Seeking	Interviews	Ethnomusicologists n=14	Feelings of nervousness and confidence experienced when seeking information.
Alemna and Skouby (2000)	Seeking	Survey questionnaire	Politicians n=94	Ranking of subjects' perceptions of information.
Levin (1991)	Seeking	Survey questionnaire	Local government n=156	Ranking of information resources used by subjects.
Wai-yi (1998)	Seeking and use (initiating, formulating, forming, assuming, confirming, rejecting, finalising and passing on)	Interviews	Auditors n=8	The stages of information seeking and using processes. The affective responses in the seeking process.
Makri, Blandford and Cox (2008)	Seeking (collating, editing, updating, recording, selecting)	Grounded theory approach. Observations and interviews	Academic Lawyers n=27	Information seeking behaviour subtypes as an extension to Ellis' subtypes.

D'Alessandro, Kreiter and Peterson (2004) characterised the information seeking behaviours of paediatricians using a modified critical incident technique in a telephone survey to conclude that a high rate of paediatricians were using computer resources to aid their information seeking. D'Alessandro, Kreiter and Peterson (2004) categorised the information resources consulted by the paediatricians as people, paper, computer and other. Their study focussed on information seeking which is similar to a study by Bryant (2004) who used quantitative data on library use, individual interviews and group discussions to determine family doctors' preferences in information seeking and demonstrated, through empirical evidence, how the presence of a librarian positively impacted on the doctors' library use. This approach focussed on the impact of an information provider on an external user, a similar approach taken by Urquhart et al (2007) who used mixed methods research with questionnaire surveys and individual interviews to demonstrate positive changes in information seeking behaviour in clinical teams after the introduction of a library service. Grieves (1998) used a different approach

and presented the findings of 5 studies that focused on the impact of the use of information from information providers and sources on decision making.

Ocheibi and Buba (2003) followed on the theme of information seeking behaviour of medical doctors without considering other forms of information behaviour. Ocheibi and Buba (2003) presented classifications of information sources – formal, semi-formal and informal – with formal sources being the most preferred and also the subjects' low frequency of delegating search activities to others. Gravois et al (1995) reported on a survey of information seeking practices of dental hygienists but the emphasis of the results was on information sources and computer application used by the hygienists. Gravois et al (1995) found that, in seeking information for professional development, dental hygienists mostly asked colleagues and browsed paper-based sources. This was not entirely surprising because at the time of the inquiry, internet use and search were not widespread as they are today. McKnight (2007) employed a grounded theory approach to engage in participant observation and questionnaire survey studies of 6 nurses' information behaviour. McKnight (2007) reported information recording, passing on information, and seeking information as forms of nurses' information behaviour, all represented in a nurses' patient chart cycle of informative interactions. In presenting the information interactions in the patient chart cycle, McKnight (2007) described a critical care nurse as someone who processes information because of large numbers of information interactions but admitted that in the early stages of the empirical evidence gathering at the start of each shift, she could detect the quality of behaviours such as listening and mental processing of information decreasing as the shift progressed. Another important finding was the nurses' good multitasking skills but fear of making errors when multitasking. The information behaviours presented and discussed in McKnight (2007) provide useful insights into the components of information behaviour.

Musoke (2007) aimed to develop an interaction-value model of information behaviour of primary healthcare providers. She was able to demonstrate a process of human information behaviour that involved cognitive, affective and contextual factors, including information dissemination and seeking activities. Musoke (2007) argued that information behaviour can include or exclude seeking and described the complexity of the information environment she was studying. Musoke (2007) also added that the value of information was an important driver of information behaviour activities. On the other hand, Kostagiolas, Aggelopoulou and Niakas (2011) aimed to "investigate the information seeking behaviour of public hospital pharmacists" (p. 302). While valuable findings were obtained from the study particularly with regard to the obstacles to pharmacists accessing information, the study was mainly limited to information sources, information needs, and

problems that affected access to information, to the exclusion of the identification of the actual behaviours during the information seeking process.

Landry's (2006) in-depth interviews of 12 dentists found that work roles had an effect on the type of sources of information and revealed the barriers to information seeking as lack of time, drawn out process, poor search skills and irrelevant material. The issue of work roles resonates with the present study because, as described in chapter 4, the information workers in the present study's research location have different roles and insights from the study can help the development of the research questions in the present study.

Meho and Tibbo (2003) interviewed 60 social scientists and made a significant contribution to information seeking by confirming, and then suggesting extending Ellis's (1993) information seeking behaviour sub-processes of starting, chaining, browsing, differentiating, monitoring, and extracting to include accessing, networking, verifying, and information managing. The information seeking behaviour subtypes are useful to be aware of so that a discussion of the findings of the present study can, if necessary, include reference to what is already known about information seeking behaviour.

Ikoja-Odongo and Ocholla (2004) reported the results of a study of information seeking behaviour of entrepreneurs and addressed the term impact in relation to information use. Ikoja-Odongo and Ocholla (2004) found that the subjects preferred informal sources of information and oral means of disseminating information but attributed this to their personal characteristics such as deficits in information literacy skills. Ikoja-Odongo and Ocholla (2004) also reported information use impact as business improvement, publicity and growth, better coordination, skills improvement, better opportunities, and increased motivation. These findings provide insights into the individual characteristics on information behaviour which can influence the development of the research questions and of help towards any discussion on findings in the present study related to individual characteristics and impact.

Information seeking behaviour has been researched extensively on scientists, due, in part to the broad range of professions that can be classified as scientists and the fact that many of them are engaged in research activities. Most of the studies, for example Majid, Anwar and Eisenschitz (2000) and Zawawi and Majid (2001) on biomedical scientists, Hallmark (2003) on atmospheric scientists, and Murphy (2003) on environmental scientists have used survey questionnaires as the main data collection method with valuable insights about their implementation which provide learning points for consideration when developing the present study's methodology.

Bigdeli (2007) proved his hypothesis that engineers who worked in various sites engaged in different information-seeking behaviours and that their information-seeking triggers were mainly to develop expert knowledge with up-to-date information. A similar study of design, process and manufacturing engineers was carried out by Kwasitsu (2003) who determined that the main information-seeking triggers were the need to solve a problem, plan a project and explore and confirm an idea. Both these studies provide information useful for understanding the role of information-seeking triggers and how individuals within the same discipline but with different roles engage in different information seeking behaviours even when exposed to the same information seeking triggers.

Mutshewa (2007b) explored the information behaviours of environmental planners with a view to determining how the behaviours can be supported by information policy. Mutshewa (2007b) showed that there was a range of behaviours such as information searching and gathering; sharing, dissemination and access to environmental information; and evaluating information which leads on to creating environmental plans. This is an example of another researcher who has not confined her research to information seeking. Robinson (2010) also did not confine her research to information seeking. She used the method of allowing subjects to capture data on work time spent on various information behaviours over a 20-day period as well as a brief questionnaire to capture demographic data. Robinson (2010) identified the information behaviours of (i) giving, receiving and seeking information, (ii) asking, receiving and answering questions, and (iii) receiving answers. While these studies were not about information providers, they revealed a wide range of behaviours which can help towards the development of the conceptual framework for the present study, given the shortage of information provider studies that uncover different information behaviour subtypes from their research subjects.

As discussed in chapter 1, there are limited studies of information behaviour of information providers in LIS. Most of them focus on information behaviour of competitive information professionals or journalist's information seeking behaviour. Anwar, Al-Ansari and Abdullah (2004) investigated the information seeking behaviour of Kuwaiti journalists and found that their information sources were both formal and informal and lack of available time was the most important problem faced while searching information.   Their study provided insights into experiences of information seeking and offered a way of categorising information sources.

Attfield and Dowell's (2003) study of British journalists was not just confined to information seeking. Attfield and Dowell's (2003) findings showed the information activities within the initiation, preparation and production phases of work and identified the dimension of uncertainty.   Going beyond information seeking into the territories of production, delivery

and transfer of information was adopted by Diso (2005), in his examination of the role of Nigerian TV journalists in information production, transfer and delivery. He argued that, because of the role of journalists, their information behaviours have a tremendous impact on society with some politicians introducing rigorous checks on their behaviour. This type of impact is external impact, which Diso (2005) categorises as positive or negative, significant or insignificant. Although the present study addresses internal impact, insights from Diso's (2005) arguments on external impact are useful in the present study for understanding classification of impact and their relationship with information behaviour.

Occupational groups such as information officers and securities analysts are information providers. Rose (2006) examined the information activity of rail passenger information officers and found that their information activities were monitoring, investigating, communicating and relaying. He concluded that the staff would benefit from better information system support and an increased level of automation due to their current heavy reliance of human sources for situational information. Baldwin and Rice (1997) provided insights into the work of securities analysts whose work involved acquiring information from external sources, interpreting the information and disseminating information within their organisation. Baldwin and Rice (1997) found that there is no significant influence of individual demographic characteristics of the subjects on preferences of sources of information and information distribution channels. Their findings also reported that securities analysts perceive themselves as information gatekeepers.

Brown and Ortega (2005) studied the information-seeking behaviour of physical science librarians and found that their behaviours differ from those of their faculty colleagues in the physical sciences. However, the questionnaires distributed to the subjects were limited to questions about their use of research literature in their practice of librarianship.

Jin and Bouthillier (2007) aimed to understand the information activities that competitive intelligence professionals engage in. They explained that they wanted to know what happens after information is found – that is, beyond the seeking stage – so that they would contribute to the information behaviour knowledge base. Jin and Bouthillier (2007) used interviews (n=4) and diaries (n=3) to capture the subjects' information-related work tasks and activities which were:

(i) understanding customer needs, identifying and tracing information, monitoring issues, topics and the competitive landscape, thinking conceptually and critically, gathering information from focus groups, opinion surveys and online databases

(ii)   collaborating with colleagues, analysing, writing reports, editing, auditing internal information practices, processing information alerts and

(iii)   training colleagues, providing public consultations, providing information for users

The information-related activities, together with findings that showed that the role of the competitive information professionals determines which information activities they engaged in, are important for helping to shape the conceptual framework and research questions in the present study. The competitive information professionals are in the business of both finding and providing information and much useful insights of information behaviour beyond the seeking stage emerged from Jin and Bouthillier's (2007) study.

Jin and Bouthillier (2008) also used interviews (n=28) and diaries (n=15) to determine the information behaviour of competitive information professionals but focussed on their information needs, sources and seeking. The findings showed that the information behaviours included the collection of bits and pieces of information and synthesising them, and making a shift from reactive to proactive information gathering. Various information sources were identified, in addition to the classification of information sources into 'internal' and 'external'. However, the interviews included questions on methods of storage, organisation and analysis of information, which are post-information seeking activities that can help towards shaping the qualitative data gathering phase of the present study.

Private investigators have been studied by Schefcick (2004) to discover their information seeking strategies and understand the barriers that affect their search process. Schefcick (2004) found that, unlike other information professionals, deception plays a large role in their work and a major part of their work involves accessing large databases to find the accurate information about people. Schefcick (2004) recommended that future work should include researching the information providers who manage the large databases that investigators access, particularly in the area of understanding their sources of information.

Sonnenwald and Pierce (2000) studied human information behaviour in group, or collaborative, work situations and stated that the activities of creating, adjusting and executing plans required information exchange during operations and the information behaviours of seeking, synthesising and disseminating are the challenges facing command and control situations. These are information behaviours that are prominent in the battlefield but not confined to seeking.

Jogaratnam and Law (2006) explored the behaviour of hotel and tourism executives but focused on their information sources and the seeking behaviour of environmental scanning. They concluded that scanning of both the internal and external environments is essential for anticipating future opportunities. The message from Jogaratnam and Law's (2006) study for the present study is that understanding the internal environment can be useful for supporting decision making. Jogaratnam and Law (2006), like Jin and Bouthillier (2008), categorised sources of information as internal and external. They went further by stating that internal and external sources of information can be personal (e.g. colleagues, customers, suppliers) and impersonal (e.g. the internet, publications, reports).

There are other information seeking research whose research subjects are not relevant to the present study but whose methods and findings are relevant because they provide a better understanding of some of the concepts necessary for developing the conceptual framework. They include Wicks' (1999) research on the information-seeking behaviour of pastoral clergy, Liew and Ng's (2006) investigation of the information-seeking behaviour of ethnomusicologists, Alemna and Skouby's (2000) investigation into information needs and information-seeking behaviours of members of parliament in Ghana, and Levin's (1991) assessment of the information-seeking behaviour of municipal and county government officials. Wicks (1999) found that the clergy were more open than closed to sources of information outside of their immediate world and this is a useful concept to consider in the present study. Liew and Ng (2006) identified formal and informal search practices in addition to directed and conditioned viewing by the ethnomusicologists. They also determined the degree of ethnomusicologists' feelings of nervousness and confidence during library use, internet searching, browsing and consulting with other people all of which are relevant components of information behaviour. Alemna and Skouby (2000) found that the politicians perceived published and unpublished materials as the most important type of information which was also supported in Levin's (1991) findings.

Wai-yi (1998) investigated the processes that people in the workplace go through in order to seek and use information effectively and developed an information seeking and use process model for the workplace. Her subjects were auditors. Wai-yi (1998) concluded that the situation people perceive they are in can be used as a predictor of choice of information sources and other information behaviour. Auditors made sure the information gathered was accurate and reliable, and felt frustrated when they received conflicting information. Wai-yi (1998) also presented the stages of processes that the auditors went through - initiating, formulating, forming, assuming, confirming, rejecting, finalising and passing on information. Wai-yi (1998) also found that the auditors experienced the feelings of confidence, stress, frustration, annoyance, anxiety, worry, and unhappiness.

Wai-yi's (1998) study provided insights into psychological experiences that accompanied the auditing activities of the auditors which add to an understanding of information behaviour and its possible relationships with emotions.

Makri, Blandford and Cox (2008) investigated the information seeking behaviours of academic lawyers and, like Meho and Tibbo (2003), validated and extended Ellis's (1989) model of information seeking to include the seeking behaviours of selecting, updating, recording, collating and editing which are subtypes of information behaviour that can be used to compare and contrast with the findings of the categorisation of information behaviour in the present study.

Much of literature reviewed in this section focuses on information seeking behaviour with only a handful addressing further types of information behaviour. It is also evidenced that much of the literature is also focussed on the external user of information as research participants with only a few studies addressing the information behaviours of information workers.

2.4.2.4 Emerging questions

Although only a selection of studies are reviewed here from the vast numbers available, the greater proportion of those that focus on information seeking and external users of information are a reflection of the studies actually available.   Their findings, research approaches and recommendations for future research are useful for informing the development of the research questions in chapter 3.

Several questions emerge from the occupational group information behaviour literature. Some of these questions are raised in the studies' sections on recommendations for future research and others developed as the studies were being read in depth. The questions include – what information resources types and categories are consulted by information workers? What sub-types of information seeking are relevant to information workers? Are Ellis's (1989) information seeking behaviour sub-processes applicable to information providers? What are the triggers of information behaviour for information workers? What information behaviours do information workers engage in? What do information workers do? How do individual characteristics – gender, age, social class, personality, culture, disability, and race – affect information behaviour of information workers? The questions are numerous and they cannot all be addressed here. However, a few of them are related to the aim of the present study and so can be refined and incorporated in the conceptual framework and research questions.

2.4.3 Models and theoretical frameworks

The small number of existing information behaviour theories and models reviewed here have been prioritised and selected according to relevance to the present study. Wilson (2000) provides a valuable insight into the relationships between various models of information behaviour and argues that the models are complimentary and not conflicting.

Most of the models of information behaviour focus on information seeking behaviour. However, a significant minority are more comprehensive and include other forms of information behaviour which help towards capturing the spirit of the word 'totality' in Wilson's (2000) definition of information behaviour even though they may not have been developed with information providers in mind. The models and theories that are reviewed in this section are selected because they have the most relevance to the present study's aim of developing a model of information behaviour of an information provider; they are relevant for the development of the research questions which are present in chapter 3; and they are selected against the backdrop of the Bouthillier and Shearer's (2003) information-processing model of competitive intelligence cycle shown in figure 1.2 and Baumeister et al's (2007a) representation of how emotion can be an outcome of behaviour and then facilitates learning for future behaviour as shown in figure 1.3, both of which are a part of the integrated theoretical framework. A model is "most useful at the description and prediction stages of understanding a phenomenon" (Bates 2005a, p. 3).

2.4.3.1 Wilson's 1996 Model

Wilson (1999a,b) is one of the key contributors to the development of models of information behaviour. His 1996 model, in figure 2.9, shows that a person responds to an information need which triggers a desire to meet these needs. There are various activating mechanisms which help or hinder the person's desire to meet the needs. The mechanisms are taken from (i) stress/coping theory which explains why the person does not engage in seeking behaviours to meet every one of the information needs, (ii) risk/reward theory which explains why the person may prefer to use certain information sources to meet the information needs and (iii) social learning theory which explains why a person is self-efficacious in meeting all the information needs.
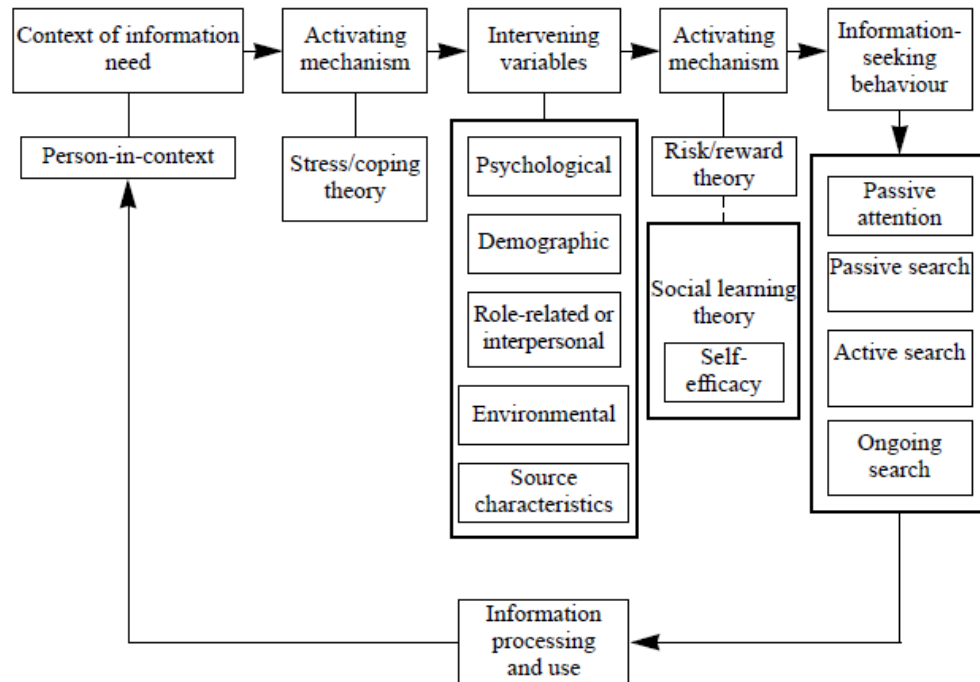
Figure 2.9 Wilson's 1996 model of information behaviour

(© Wilson (1999b). Reprinted with permission)

Wilson (1999b) also presents in his model the intervening variables which are psychological, demographic, work role, environmental and characteristics of the information source. These variables may have an effect on the information seeking behaviour of the person who intends meeting the information need. The information seeking behaviour, according to Wilson (1999b), can be of 4 types – passive attention, passive search, active search and on-going search. An important part of the model is the information processing and use stage which serves as a feedback loop. Wilson (1999b) does not describe this stage in detail because he intends the model to be high level, or macro, which serves as a springboard from which further research questions could be generated. Wilson's (1999b) model supports the integrated theoretical framework presented in chapter 1 and provides some insights about what happens beyond information seeking.

Fisher and Naumer (2006), in their theory of information grounds, show that information behaviour comprises information needs, information seeking, information giving and information use which implies that much also occurs beyond the information seeking domain. Another useful aspect of Wilson's (1999b) model in figure 2.9 is the set of intervening variables which are also relevant to the context of the present study in which information workers may have a set of personal characteristics which may not only affect their seeking behaviour, but also affect what happens beyond the information seeking stage. Wilson looks to psychology to explain the activating mechanism which initiates the

information seeking behaviour. With emotion playing a major role in the present study's theoretical framework, psychology becomes very relevant to information behaviour.

However, a couple of points about Wilson's 1996 model are worth highlighting. The first is that Wilson's 1996 model appears to imply some degree of linearity from the information seeking stage to the 'information processing and use' stage thus giving the impression that an actor cannot engage in information processing without first having engaged in information seeking. Despite this, Wilson's 1996 model contains valuable elements within it which can be applied to an information provider.

The second point is that Wilson's 1996 model appears to suggest that an activating mechanism causes information seeking behaviour to commence which implies that the other information behaviours are not initiated by activating mechanisms. This issue was also highlighted in Niedźwiedzka's (2003) thorough critique of Wilson's 1996 model. Niedźwiedzka (2003) set out to construct a general model of information behaviour as shown in figure 2.10 below.
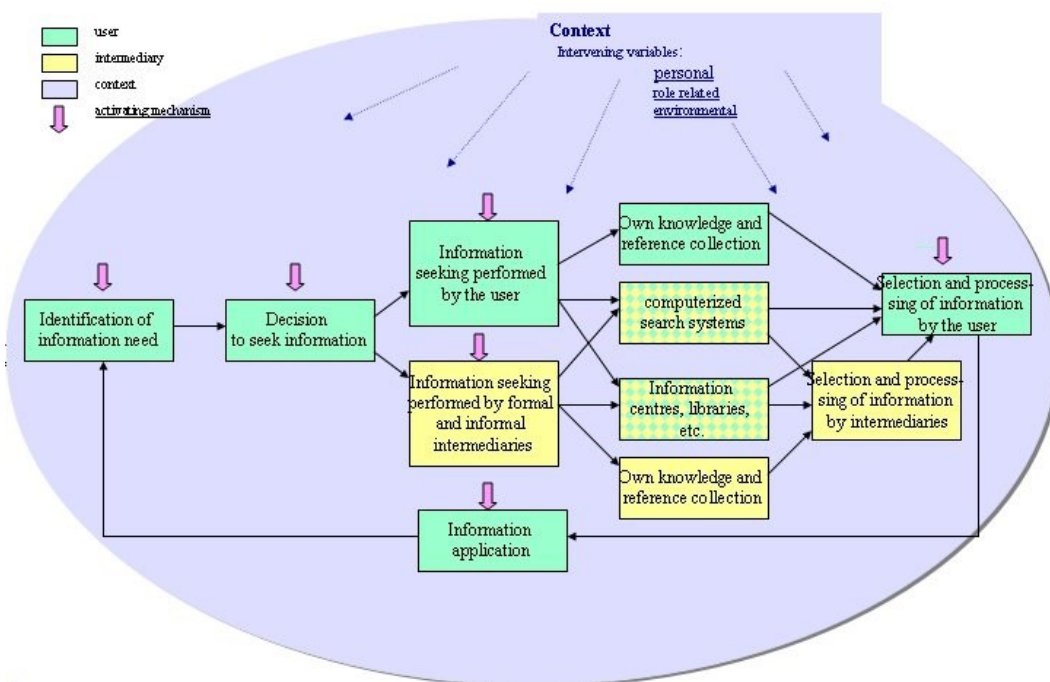
Figure 2.10 A new model of information behaviour

(© Niedźwiedzka (2003). Reprinted with permission)

Niedźwiedzka's (2003) model was developed as a result of carrying out a critique of Wilson's 1996 model, resulting in a new general model of information behaviour, shown in figure 2.10. The model focused on (i) the fact that information seeking can also be a delegated activity, (ii) amalgamating Wilson's (1999a) 'person-in-context' and 'intervening

variables' and (iii) showing that the activating mechanism is not restricted to information seeking behaviour. However, Niedźwiedzka's (2003) new model, as shown in figure 2.10, did not address the fact that Wilson's 1996 model did not detail the information behaviours that take place when once information is found even though the intention was implied in her study.

2.4.3.2 Integrated HIB Framework

Spink, Park and Cole (2006) and Spink and Cole (2006) conceptualised multitasking not only within the information seeking domain but also within other forms of information behaviour, thus covering the complex nature of information behaviour. The integrated information behaviour framework is adapted to show its key elements in figure 2.11.

Figure 2.11 Integrated HIB framework

(Adapted from © Spink and Cole 2006, p. 232. Springer Science and Business Media)

Spink and Cole (2006) refer to the integrated framework as holistic. The framework starts off with concepts of information over time using the language of evolutionary psychology.

The framework conveys the idea that information behaviour has been an instinctive practice by human beings which has been responsible for their basic survival and has evolved over time to a higher degree of complexity. This evolutionary approach to information behaviour is again emphasised in the Spink's (2010) more recent writings on the evolutionary instinct of information behaviour.

In Spink (2010), it is stated that information seeking is just one of the sub-processes of information behaviour and the others are, as illustrated in the integrated framework in figure 2.11, organising, foraging, sense-making, information grounds, information sharing and use. This approach to viewing information behaviour as an outer core process with several inner core processes of which information seeking is what makes the integrated framework so relevant to the present study. Some concepts in the integrated framework are worth defining to get a better understanding of the framework:

- Information organising behaviour is the process of "analysing and classifying materials into defined categories" (Spink 2010, p. 68, Spink and Cole 2006, p. 25).
- Information foraging takes place when a person perceives an information attention or information scent (Spink and Cole 2006) and "if the scent is strong, the information forager can make the correct choice; if there is no scent, the forager will have to perform a random walk through the environment" (Spink 2010, p. 67).
- Sense-making behaviour takes place when the person uses their own and other's observations to create their own construction of reality within their time-space context in order to bridge an information gap. In making sense of a situation, the person may be influenced by the energies that emanate from their feelings, thoughts, emotions and motivations (Dervin 1983, Savolainen 2006). Dervin (1983) developed the sense-making model, which has subsequently been utilised by other researchers such as Savolainen (2006) and Spink, Park and Cole (2006), and Dervin's (1983) model has been described as "a model of methodology, rather than a model of a set of activities or a situation" (Wilson, 1999b, p. 257).
- Information use behaviour takes place when the person and their information world come together in such a way that the information that is generated by information behaviour is incorporated into the person's existing knowledge base (Spink, Park and Cole 2006). Information use can also be described as taking place "when the individual selects and processes information which leads to a change in the individual's capacity to make sense or to take action" (Choo et al 2006, p. 495). The term information use as used by information scholars is rather subjective and can be interpreted in several ways as described in section 2.4.1.5.
- Information grounds as a term was developed by Pettigrew (1999) to depict a meeting place for different types of actors and was empirically tested by Fisher et al (2005b) in

their telephone survey of 612 local residents' information grounds and everyday information seeking habits. In conceptualising information grounds in her contribution to theories and models of information behaviour, Fisher et al (2005b) explain that, as actors gather at information grounds, they engage in information behaviours that involve information needs, seeking, giving and use.

- Information sharing is defined and explained in section 2.4.1.4 of the present study.

At the heart of human information behaviour framework is the multitasking and coordinating information behaviour. What is fascinating about this aspect of the framework is that Spink and Cole (2006) state that multitasking does not only exist within the information seeking domain. This implies that multitasking can occur within other forms of information behaviour in addition to information seeking behaviour. This argument provides insight into multitasking information behaviour which can be used to compare with the findings that will emerge from the present study. However, the collaborative elements of information behaviour do not have prominence within Spink and Cole's (2006) integrated HIB framework. If they are embedded within the seeking and post-seeking stages of information behaviour, they have not been given prominence in Spink and Cole's (2006) integrated HIB framework.

2.4.3.3 Wilson's Nested Model

Wilson (1999a, b) presented his nested model of information behaviour as shown in figure 2.12. Wilson (1999b) explains that information search behaviour (interactions between people and systems) is a subset of information seeking behaviour (methods of interacting with information) which, in turn, is a subset of information behaviour (the broad investigative field). Spink and Cole (2004) also agree that information seeking behaviour is a subset of information behaviour and Nahl (2001) states that information behaviour does contain a hierarchy of sub-behaviours.
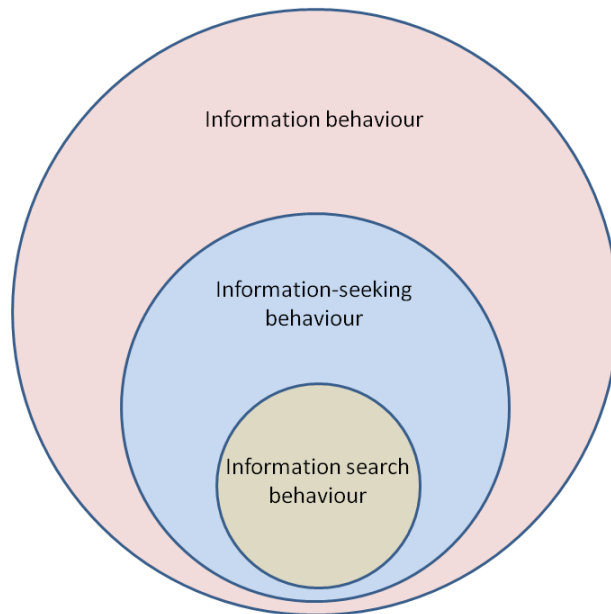
Figure 2.12 Wilson's nested model of information behaviour

(© Wilson (1999a, p. 257). Reprinted with permission)

Although the focus of figure 2.12 is on information seeking subset of information behaviour, it is still relevant to the present study. This is because the model implies, according to Godbold (2006), that there are other modes of information behaviour and not just information seeking behaviour. This provides an exciting opportunity for the present study because it supports its aim of determining and categorising information behaviour of information workers which will go beyond the information seeking mode. However, the nested model should have included a few other nests within the information behaviour nest. Even a nest labelled 'other modes of information behaviour' would have presented an unequivocal argument that other information behaviours in addition to information seeking behaviours do exist.

2.4.3.4 The CIA Intelligence Cycle

The Central Intelligence Agency (CIA) in the United States is responsible for providing accurate and timely intelligence to all those in the US Government, including the President, responsible for US national security policy (CIA 2011). To provide intelligence, the employees of the CIA embark on a 5-stage intelligence cycle represented in figure 2.13.
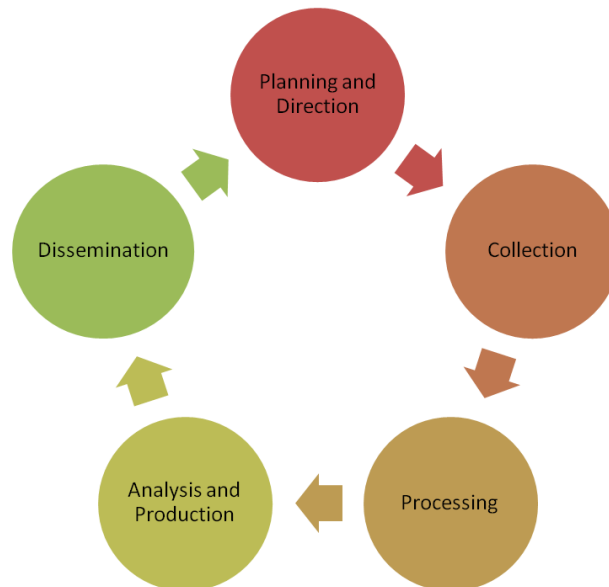
Figure 2.13 The intelligence cycle

(Adapted from CIA 2011)

According to CIA (2011), the cycle starts with the planning and direction stage where the employees identify the intelligence needs and agree on a course of action for gathering the information. Planning involves an assessment of the resources, capability and data requirements, whereas direction involves the requirements from the policy makers (Johnston 2005).

CIA (2011) and Johnston (2005) explain that the next stage is the collection stage where data is gathered by open and covert means using a variety of open-source and classified material. Following this stage is the processing stage where the data are reduced to usable report format which can be used in the analysis stage. The analysis and production stage involves a more detailed look at the information gathered and quality and reliability checks, sense-making behaviours, collaborative checking, and oral briefs all take place and an appropriate product that meets the needs of the policy maker is ready for dissemination. The final stage is the dissemination stage which involves giving a final written and/or oral report or briefing to the policy maker. The policy maker, on receiving the final report or briefing may request further intelligence and then the whole cycle repeats itself.

The intelligence cycle therefore consists of stages that involve understanding the customer's needs, planning what is to be done, getting the information, transforming the information to intelligence and then giving the intelligence. It is very relevant to the present study because the CIA employees are basically information providers for the policy makers as are the information workers for the customers in the present study. In

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order to provide information, the CIA employees need to decide on ways of getting it, making it meaningful, adding value and giving it to the policymakers.

One major difference between the intelligence model and what is being developed in the present study is that the intelligence model has neither a psychological element to it nor statements about the perceived impact of the information behaviours associated with the intelligence cycle. Another issue with the intelligence cycle is that it is very specific to agents who work at the Central Intelligence Agency who have to go through a series of mandatory orderly steps for producing intelligence. The intelligence cycle, as is presented diagrammatically, will therefore pose a problem for representing the work of information providers in the present study due to its rigidity of steps and the absence of a psychological element.

2.4.3.5 Godbold's Extension of Wilson's 1981 Model

Godbold (2006) set out to develop a general model of information behaviour which would incorporate not only information seeking behaviour but other modes of information behaviour as well. Godbold (2006) developed an extension to Wilson's 1981 model of information seeking behaviour which is shown in figure 2.14.
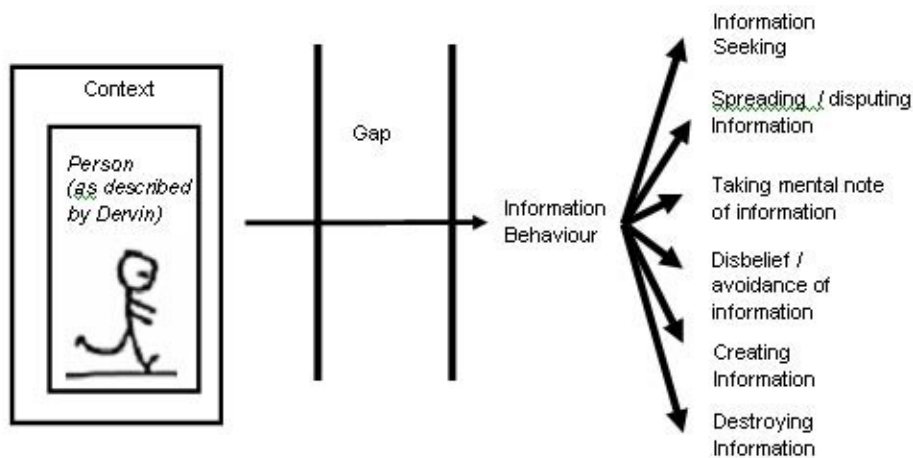
Figure 2.14 Extension of Wilson's 1981 model of information seeking behaviour

(© Godbold (2006) Reprinted with permission)

The model presented by Godbold (2006) is an integration of:

- Dervin's (2003) sense-making model in which a person in a particular context is sense-making and then experiences an information gap. To navigate the gap, the person then engages in information behaviours which are influenced by the person's cognitions, feelings, emotions, values, beliefs and memories,

- Ellis's (1989) model of information seeking behaviour which comprises the activities of starting, chaining, browsing, monitoring, differentiating, extracting, verifying and ending and

- Godbold's (2006) assertion that information behaviour is not limited to information seeking behaviour and that it includes spreading/disputing information, taking mental note of information, disbelief/avoidance of information, creating information and destroying information.

Godbold (2006) adds that the model she proposes in figure 2.14 is multidirectional and proposes that further improvement to the diagram is required. Godbold (2006) crucially provides the caveat that the modes of information behaviour that the diagram illustrates are not exhaustive. This has implications for the present study which sets out to determine modes of information behaviours of an information provider in that Godbold's (2006) model recognises that other researchers may determine a more comprehensive list of information behaviours in the course of their empirical work.

2.4.3.6 Kuhlthau's Model of Information Search Process

Kuhlthau's (1993, 2004) model of the information search process depicts the progression of emotions, cognitions and actions as an actor is engaged in the information search process. The stages of the search process that the actor goes through, according to Kuhlthau (2004), are initiation, selection, exploration, formulation, collection and presentation. In Kuhlthau's search process, which has been adapted in figure 2.15 below, as the stages of the search process progress from exploring and seeking relevant information, the actor experiences feelings that are mostly negative up to point of formulation when the feelings start to become positive with feelings of clarity followed by feelings of confidence. At the end where documenting and seeking pertinent information are taking place, there are feelings of satisfaction or disappointment depending on whether the searcher achieved what they set out to do. As the actor is experiencing these different feelings, the actor's thoughts are moving from vagueness to being more oriented and focused while gaining interest in what is being searched for.

Kuhlthau's (2004) model highlights the thinking, feeling and acting dimensions to information search behaviour which is a useful conceptualisation for consideration in the present study.
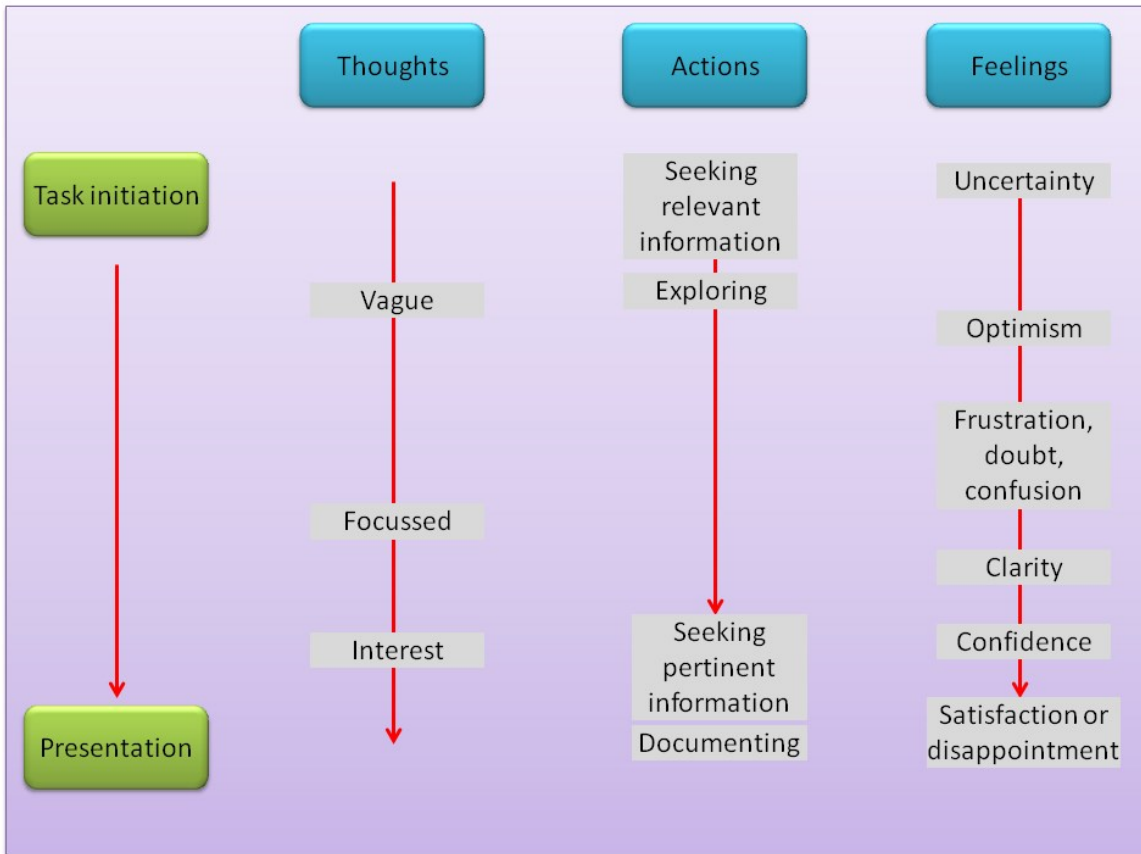
Figure 2.15 Information search process

(Adapted from Kuhlthau 2004, p. 82)

Kuhlthau, Heinström and Todd (2008) carried out a survey of 574 students to determine that the information search process is still relevant since it was developed in the 1980s. While the model is within the information seeking domain to the exclusion of other modes of information behaviour, it is nevertheless relevant to the present study because it describes a range of feelings during the stages of one mode of information behaviour. It would therefore be pertinent to determine whether these feelings are experienced when engaged in other modes of information behaviour. Savolainen (2009) asserts that one of the strengths of Kuhlthau's (2004) model "is that it places information use in the context of information seeking that contributes to learning" (Savolainen (2009, p. 197).

Yeh (2008) developed a model similar to, and heavily influenced by, Kuhlthau's (2004) model. She interviewed 10 gays and 4 lesbians to determine the subjects' information behaviour and their construction of their world. Yeh (2008) found that the subjects used the found information to become more aware of themselves, construct their new-found homosexual world, widen their imaginative and social space, and confront prejudice. The representations of the subjects' constructions and their information behaviour were

captured and illustrated in Yeh's (2008) model of characteristics of the information behaviour of gays and lesbians which is adapted in figure 2.16 below.
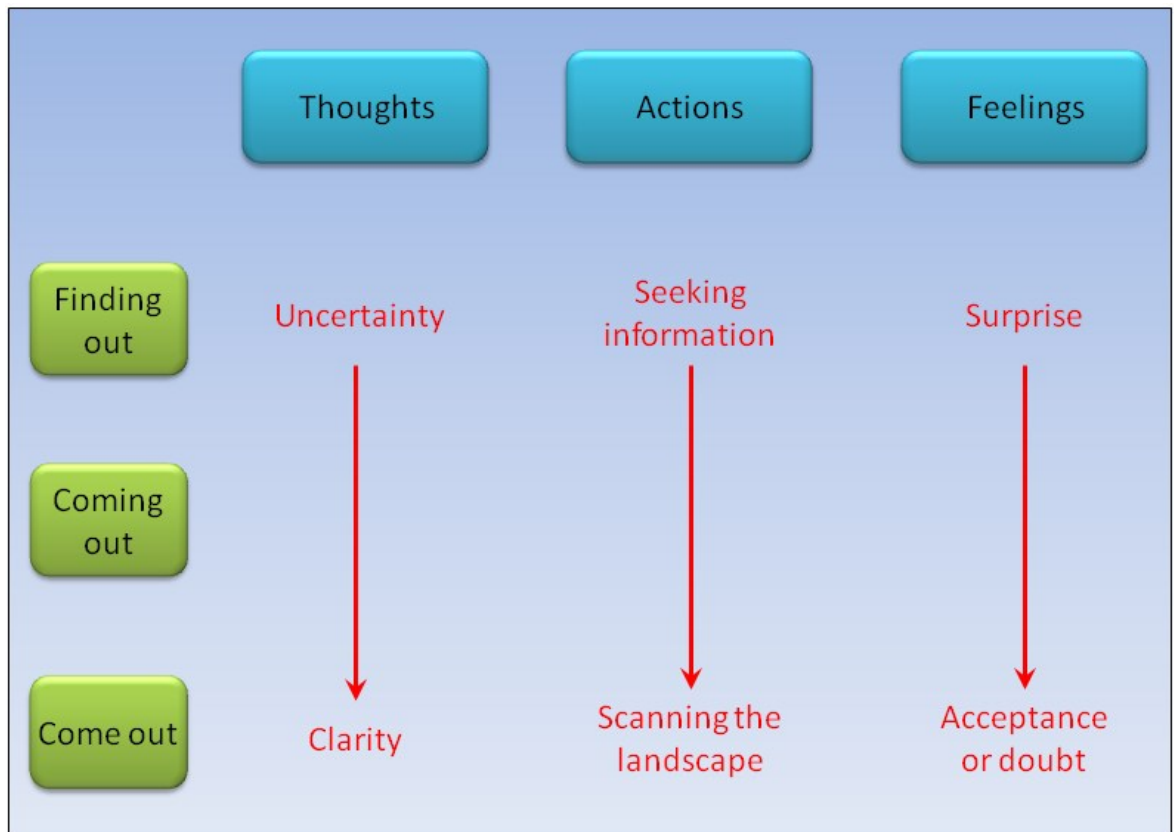
Figure 2.16 Information behaviour model of gays and lesbians

(Adapted from Yeh 2008)

The adapted model in figure 2.16 depicts how gays and lesbians find out about the gay and lesbian community and begin to identify themselves with what they find out. At this stage they have thoughts of uncertainty but they are surprised about the information available as a result of their searches. They then use the information they gather to contact the gay and lesbian community and eventually become confident (or not) in coming out as gay or lesbian. They subsequently become members of the gay and lesbian community, there is clarity in their thoughts about where they want to be, and they continue to scan the information landscape for new and previously unknown information in order to become more informed. At this stage they gain acceptance from those around them or they continue to have feelings of doubt about where they want to be. One difference between the models in figures 2.15 and 2.16 is that *uncertainty* and *clarity* are labelled as thoughts in Yeh's (2008) model and these same two terms are labelled as feelings in Kuhlthau's (2004) model.

Wilson (1999b) posited that all models have a feedback loop because actors in real life do not go through information behaviour stages without problems; and that they may have to go back to an earlier stage of the process due to an information interaction experience that requires the gathering of more information. Wilson (1999b) adds that, while Kuhlthau's model does not show a feedback loop, it is inevitable that a loop exists.

As with Kuhlthau's (1993, 2004) model, although Yeh's (2008) model focuses on information seeking mode of behaviour, it reveals a range of feelings and thoughts during a mode of information behaviour that are pertinent to the present study's theoretical framework.

2.4.3.7 Emerging questions

The models reviewed in this section provide opportunities for a great number of questions, some of which influence the development of the research questions in the present study. A selection of the questions is as follows: – What initiates the information behaviour of an information provider? What information behaviours occur beyond the information seeking stage? What emotions influence, and result from, information behaviours of information workers? What are the psychological influences on information behaviours of information workers? How is information use manifested when an information provider interacts with information? Can the nested model of information behaviour be extended to include other modes of information behaviour? What are the information behaviour sub-types for information processing, production and dissemination? Can Kuhlthau's information search process be replicated for other modes of information behaviour?

2.5 Feeling states

Albright (2011) argues that for the discipline of library and information science to allow for a better understanding of information behaviour, it must look to psychology which has a plethora of theories of human behaviour and behavioural change. Kalbach (2006) determined that web information seeking is an emotional experience which is represented by the thoughts and feelings in Kuhlthau's (1993, 2004) information search process.

Feeling state is used as an overarching term in the present study to refer to those processes in individuals that are related to their feelings. Feeling states include affect, mood, and emotions which are all commonly used interchangeably with the term *feelings*, the common denominator. Nahl (2001) explains that affective issues are significant in the study of information behaviour and knowledge construction and Goette and Huffman

(2005) argue that "it is in the interest of employers to identify and perhaps influence the goals and affective engagement of workers" (Goette and Huffman 2005, p.32) because affect can be productive if it leads to greater motivation. The definitions of affect and emotion by Baumeister et al (2007a) are presented in section 1.6.4. The difference between both terms is that affect is short, automatic, can be an unconscious feeling, and does not include cognitive processing. Emotion, on the other hand, depends on physiological (facial and bodily) arousal and "the cognitive interpretations of that arousal" (Wade and Tavris 1993, p.321). That is, unless a cognitive appraisal of the experience takes place, emotion will not be felt. This approach has been challenged by other psychologists as explained in section 2.5.1. Moods are "low-intensity diffuse states that usually do not have a clear antecedent and, unlike emotions, people may not realise that they are experiencing a mood and may not realise that moods are influencing their behaviour" (Kelly and Barsade 2001, p. 103). Therefore the subject of the integrated theoretical framework, with regard to feelings, is emotions. This is because of the conscious nature of emotions and the fact that there is an involvement of cognitions in the experience of emotions.

Why are feelings important? Positive feelings result in increased work motivation (Forgas and George 2001), which in turn drive future behaviours (Critchley 2009). People who experience negative feelings at work "are more likely to withdraw from their jobs than those who do not have such experiences" (Brief 2001, p. 136). When people interact with one another, they can vicariously experience the emotions of others by inadvertently sharing emotions (Kelly and Barsade 2001). Brief (2001) argues that, in a work environment, experiences of negative emotions tend to be easier to share with colleagues in work groups, and these vicarious emotions can influence group performance and therefore organisational performance. Brief (2001) therefore asserts that researchers must focus attention to emotions in the organisation. This is a relevant assertion for the present study which aims to capture categories of information behaviour in an organisation.

2.5.1 Categories of Emotion

Kuhlthau (1999), in empirically identifying the emotions and thoughts experienced during the information search process, laid the foundations for much of the subsequent library and information science research on emotions and information behaviour. According to Lopatovska and Arapakis (2011), research on emotions is growing and researchers have found that at least 5 basic emotions exist which are common in most contexts: anger, happiness, sadness, fear and disgust, although it should be noted that other types of emotions exist. This is consistent with Wade and Tavris's (1993) findings from the literature. It is also consistent with Knautz and Stock's (2011) empirical study on

emotional information retrieval which aimed to index 20 YouTube video clips using 776 participants and identified 9 types of emotions that comprised the basic five plus love, fun, surprise and desire. Schmidt and Stock (2009) used 763 participants to tag emotions caused by images retrieved from Flickr and they used the basic five emotions. Lopatovska and Arapakis (2011), in their review of literature on emotions and information behaviour, found that one of the most simple and cost-effective means of carrying out research on emotions is by self-reporting which has the disadvantage of subject bias and willingness to report; but added that other methods exist such as electrical sensor monitoring which require special equipment and observations which are difficult to capture the subjective experience of emotions. The self-reporting method of capturing emotions in subjects is supported by Gwizdka and Lopatovska (2009) who state that asking subjects how they feel is a very popular method in information science literature for collecting data on subjective states.

Wade and Tavris (1993, 2010) argue that emotion is such a complex experience that it can be positive, negative, flat (neutral) or mixed. They explain, for example, that in experiencing mixed feelings after sitting an exam, people can describe being guilty ("I should have studied harder"), fearful ("What if I don't pass") and apathetic ("I don't care about this course anyway") at the same time (Wade and Tavris 1993, p. 323).

2.5.2 Theories of Emotion

Much disagreement has existed in the literature for many years as to what exactly emotion is especially as it comprises, according to Westbrook (1983), the interrelated areas of conscious feeling, nervous system processes, and facial and bodily physiological manifestations. This has led to a number of theories of emotions of which a few with opposing approaches, but which are relevant to a person engaging in information behaviour, are discussed here. Kleinginna and Kleinginna (1981) compiled 92 definitions of emotion with a view to achieving consensus and revealed that a great number of definitions confirmed that emotion is a feeling state that can lead to, or influence behaviour. Emotion was also described, in some cases, as an expressive behaviour.

A self-monitoring integrated model is presented in Nahl (2001) that focuses on "what users feel, think, and do while engaged in information activities" (Nahl 2001, p. 6). The model was based on a behavioural approach to information behaviour that posits that thoughts and feelings are behaviours and that "the affective, cognitive and sensorimotor domains are categories of behaviour" (Nahl 2001, p.6).

One of the earliest theories of emotion was presented by William James, a psychologist, physician and philosopher, in the 1890s. Another independent effort was by Carl Georg

Lange, a psychologist and physician around the same time. Where there was some agreement in their respective theories, it became known as the James-Lange theory of emotion. The theory explains that exposure to, or engagement in, an event causes a physiological response in an individual which needs to be cognitively interpreted by that individual before the experience can be labelled as emotion (Lang 1994). The main difference between the ideas of James and Lange was that James placed emphasis on the conscious emotion whereas Lange emphasised the physiological response (Wassmann 2010). In summary, the James-Lange theory argues that emotion depends on a physiological response, and then a cognitive interpretation of that response and can be represented as follows:

Event ➜ Physical reaction ➜ Cognitive interpretation of reactions ➜ Emotion

On the other hand, Lazarus (1984) argues, in his cognitive appraisal theory, that in the aftermath of being exposed to, or engaged in, an event, the individual performs a cognitive appraisal of the event and, depending on the outcome of the appraisal, an emotional response and a bodily reaction are experienced. Therefore, emotion depends on a cognitive appraisal, and then a physiological response and can be represented as follows:

Event ➜ Cognitive appraisal of event ➜ Physiological response ➜ Emotion

The Cannon-Bard theory of emotion was first proposed in 1915 and subsequently refined. The theory proposes that when an individual is exposed to, or engaged in, an event, neural impulses are generated which are processed by the thalamus in the limbic system of the brain which sends messages to the sympathetic nervous system (that triggers a physiological response) and simultaneously to the cerebral cortex (that triggers a feeling of emotion) (Westbrook 1983, Cannon 1927). It can be represented as follows:

Event ➜ Physiological reaction and emotion

The conflicting arguments about the nature of emotion led Baumeister et al (2007a) and Baumeister, Dewall and Zhang (2007b) to develop the dual process of emotion within a feedback loop whereby conscious emotional outcome, which comprises emotion and mood brought about by a behaviour, triggers thoughts and learning (cognitive appraisal) for influencing future behaviours; and automatic affect which is mostly unconscious, directly influences future behaviours. Baumeister, Dewall and Zhang (2007b) warn that

emotions can also occur as a result of other people's behaviour and the external environment.

2.5.3 Emotion and individual characteristics

According to Wade and Tavris (2010), people's culture and work roles may determine how they express emotions. For example, some work roles such as air cabin crew may dictate that the workers mask how they really feel; and some cultures may express grief with stoicism while others, with excitement and jubilation (Wade and Tavris 2010). Mesquita and Haire (2004) state that, while the emotion building blocks are generally the same across cultures, the cognitive appraisal of events may vary between cultures but, within a culture, there may be some different emotional experiences when exposed to the same event.

Miyamoto, Uchida and Ellsworth (2010) determined from 28 European American students at an American university and 22 Japanese students from a Japanese university how they would feel if they were in each of 13 situations that real undergraduate students had found themselves in, having read the descriptions of the situations. The study found that, whereas both the American and Japanese students felt mixed emotions, the Japanese students felt more mixed emotions for the pleasant situations, and the mixed emotions in unpleasant situations showed no cultural differences (Miyamoto, Uchida and Ellsworth 2010). The emotions of the study participants were subjective reports of how they would have felt if they were in the described situations rather than their actual experiences of feelings; so this may have been a weakness of the study, as identified by Miyamoto, Uchida and Ellsworth (2010).

Butler, Lee and Gross (2007) conducted an online questionnaire survey of 166 women at an American university of whom 38% were European Americans and 45% Asian Americans and the rest belonging to other minority groups. Their results supported their hypothesis that women with Western European values suppress their emotions less frequently than those with Asian values (Butler, Lee and Gross 2007).

Wade and Tavris (2010) argue that it has not been evidenced that females in any culture experience emotions more frequently than males and vice versa.   However, stereotypes exist and Plant et al (2000), in their administration of a cultural stereotype questionnaire and personal beliefs questionnaire to 117 American undergraduate students, found that there exist gender stereotypes both in terms of expression of emotion and experience of emotion which were consistent with other studies. Emotions that imply strength such as anger and pride were perceived by the study participants to be experienced and expressed more by men and emotions that imply vulnerability such as sympathy, guilt,

sadness, love and shyness were perceived to be expressed and experienced more by women. However, Robinson, Johnson and Shields (1998) found, in a study of 140 university students who were surveyed before and after participation in a word game activity, that when people expressed their views about hypothetical males' and females' experience and expression of emotion, they tended to be stereotypical. However, when males and females are exposed to identical but real situations and then given the opportunity to assess their subjective experiences, there was no significant difference in gender self-reported emotional experiences and likewise no significant difference in male and female assessment of each other's gender expression of emotion. The problem with existing studies of gender and emotion is that they tend to focus on a narrow range of emotions and there is little or no discussion of whether combinations of individual characteristics may be influencing subjects' perceptions and subjective experiences of emotion.

The results of empirical studies that examine the association between age and emotion have no consensus (Mroczek and Kolarz 1998, Pinquart 2001, Fernández-Ballesteros et al 2010). Pinquart (2001) carried out a meta-analysis of 125 studies on age and emotion and found examples of empirical studies that showed that older adults experience:

- decreased positive and negative emotions
- increased positive emotions and decreased negative emotions
- decreased positive emotions and increased negative emotions
- no differences in positive and negative emotions when compared with younger adults

Pinquart (2001) suggested a number of reasons for the contradictory findings of the studies reviewed such as type and reliability of instrument used, the effect of the social circumstances (poverty, unhappiness, instability) of the research geographical location, and the sample representativeness; whereas Fernández-Ballesteros et al (2010) suggested that the findings can depend on which one of the 3 parameters - occurrence of emotional expression, frequency of emotional experience, and intensity of emotional experience – is examined in the empirical study.

Judge and Larsen (2001) argue that personality influences emotional experiences and expression which in turn influence job satisfaction. The 5 personality traits identified by Judge and Larsen (2001) are extraversion, agreeableness, conscientiousness, emotional stability (neuroticism) and openness.

The individual characteristics in relation to emotion are relevant to the present study because they highlight a relationship between emotion, cognition and behaviour as

identified in the literature and they put the 'person' at the centre of the information behaviour experience.

2.6 Impact and value

Several value and impact studies exist in library and information science literature. However, the focus of these studies has mainly been on the impact of (i) information or (ii) information services or (iii) information systems, rather than the impact of information behaviour which is the area of interest in the present study.

Examples of the many studies of value and impact include Marshall's (2007) Rochester study of the impact of information provided by hospital libraries on patient care, Marshall's (1992, 1993) studies of the impact of libraries on users' decision-making, Medernach and Franko's (2007) assessment of the clinical impact of information provided by a medical library, Urquhart and Hepworth's (1995) study of the value of library information to clinical decision making, Grieves's (1998) study of the value of library resources to decision making, Wood and Wright's (1996) impact of information on GP clinical decision making, So and Smith's (2003) impact of information on management decision making, and the series of studies on impact of library services on users by Williams and Wavell (2001), Wavell et al (2002) and Williams, Coles and Wavell (2002). The common thread amongst these studies is the focus on people or actors who are external to the information-providing community of workers.

Impact studies that address the internal impact of various forms of information providers' information behaviour have not been encountered during searches for use in the present study's literature review. Internal impact of providers' information behaviour, in this context, refers to that change or long-term effect on people, systems or processes occurring within the organisation or department that provides the information. The term excludes those users (for example, clinicians, the public, researchers and academics) who are external to the provider organisation or department who happen to use the information and benefit from it; but includes users such as librarians and other information providers.

A few studies of relevance to what is being investigated in the present study must be mentioned because they touch on the impact of information seeking behaviour. Pinto, Fernandez-Marcial and Gomez-Camarero (2010) aimed to determine how information behaviour of users of academic libraries impact on the requirement for quality library services and received 564 completed survey questionnaires from 10,276 sent to 19 Spanish universities. The survey instrument was developed using qualitative interviews

and focus groups together with a short quantitative survey. Pinto, Fernandez-Marcial and Gomez-Camarero (2010) hypothesised that a high quality service is determined by the expectations and perceptions of users of the service which, in turn, are defined by the information behaviour of the users. The term *users* in Pinto, Fernandez-Marcial and Gomez-Camarero's (2010) study referred to the academic and faculty staff who use the library services available to them within their university. Pinto, Fernandez-Marcial and Gomez-Camarero (2010) identified the following user information behaviours:

- Consulting materials (physical books, journal articles, automated catalogue, databases, audio-visual material, digitised books)
- Accessing (electronic journals, online library website's services)
- Requesting (loan of items, documents from other libraries, assistance from librarian)
- Filtering and selecting information
- Using special facilities (researcher's room, reading room)

Pinto, Fernandez-Marcial and Gomez-Camarero (2010) found that users showed a high demand for access to digital information with the following resulting impact:

- Availability of more computer terminals
- Availability of new technologies in libraries
- User access to wireless network
- Remote access to university online library resources

While Pinto, Fernandez-Marcial and Gomez-Camarero's (2010) study concerned itself with the impact of information behaviour, the focus, as with most studies on information behaviour, was on the user who is external to the information providing (that is, librarian) community and how the user engages in information behaviours - mainly in the seeking domain - that drive change. Even though there was focus on the external user, the strength lies in the fact that the study attempted to address the impact of information behaviour which is relevant to the present study..

Haglund and Olsson (2008) also showed how information behaviour can be a driver for change in their study of the impact of information behaviour on university libraries. Again this study was about the seeking mode of information behaviour and focused on 24 academic researchers as research subjects across 3 universities. The study used participant observation with follow-up interviews as a supplement to gather qualitative data. Haglund and Olsson (2008) found that academic researchers engaged in

behaviours such as accessing information (via Wikipedia, ejournals, ebooks, PubMed database), and using search engines (Google, Google Scholar) while (i) using trial and error search methods rather than structured search strategies, (ii) being too lazy to request physical copies of articles not available electronically, and (iii) having no understanding of the potential added value of librarians in the information search process. The impact of these behaviours, Haglund and Olsson (2008) explained, was that librarians were becoming increasingly disconnected from academic researchers and were not having a presence in their research. In addition, librarians were providing a service limited to electronic information provision and were being perceived as providing a complicated service unresponsive to emerging technologies. The opportunities for change in the study were for the librarians in the 3 university libraries to provide services that are simple, consistent, accessible and individualised (Haglund and Olsson 2008). The relevance of Haglund and Olsson's (2008) empirical study to the present study is that the impact of information behaviour, albeit of information seekers, provides an opportunity for change which the present study also seeks to explore.

Brophy (2005) defines impact as any effect of a service, product or other event on an individual or group and introduces descriptors of impact such as critical, trivial, positive, negative, intentional, short-term, and long-term; all supported by Shah (2003) in his article on impact assessment in the voluntary sector. Marshall (2007) acknowledges that there is a substantial body of knowledge about value and impact in library and information science but recommends further research on value and impact studies. Saracevic and Kantor (1997), in citing Taylor (1986), explain that library and information services add value to information by a variety of operations that include information dissemination. Information dissemination is a form of information behaviour. Marshall (2007) and Weightman and Williamson (2005) have established a link between impact and value which is demonstrated in Marshall's (2007) findings which showed that library services were valued and the information provided by the library had a positive impact on patient care. Grieves's (1998) overview of 6 studies of information use in decision making in the UK also concluded that in all cases a very high value was placed on the information sought and provided and that there was better decision making. Like Grieves's (1998) studies, Ashcroft's (1998) study used the critical incident interviewing technique in order to "pinpoint a particular situation when a need for information, connected with patient care, had caused the respondent to seek help" (Ashcroft 1998, p. 174). Bouchet et al (1998) reported a study measuring aspects of the impact of information on decision making in the pharmaceutical industry and found that managers felt that the information allowed them to decide on a course of action.

The present study focuses on *perceived impact*, rather than actual impact. Perceived impact is defined in section 1.6.1 as part of the theoretical framework. This focus on perceived impact is deliberate because the present study aims to capture *experiences* which are a somewhat subjective terminology that encompasses actors' perceptions. Furthermore, actual impact assessment is fraught with methodological difficulties. For example, Van den Berg (2005) highlighted problems with impact assessment exercises and the difficulties of the direct/indirect causal linkage and costs involved in carrying out impact assessments. Alternatives proposed by Van den Berg (2005) included more emphasis on results and recognition of the contributions of the inputs. Similar problems with impact assessments were recognised by Poll and Payne (2006) who argued that it is almost impossible to separate other influences that may contribute towards an impact on groups of individuals, especially as so many things may impact on individuals simultaneously. Separating causal linkages is beyond the scope of the present study which, instead, focusses on individual perceptions of impact.

The concept of perceived impact within the information behaviour domain is important because it enables the managers of these organisations to understand how their information staff perceive the long-term effects of the work they do. This has implications for gauging morale, willingness to embrace change and the quality of customer service that the information consumer will experience. By studying perceived internal impact of information behaviour, the provider organisation may determine whether the perceptions articulated by the information workers need to be considered during periods of change or need to addressed as a matter of urgency in order to continue to provide a good quality of service.

2.7 Information value chain

Successfully delivering a product or service which is of value to the customer is a fundamental prerequisite to organisational success (Prastacos et al 2002). Information behaviour is known to have value-adding potential which should not be overlooked. This is clearly illustrated in Cisco and Strong's (1999) value-added information chain which is described in the theoretical model in chapter 1. With the aim of this present study focussing on the capture of an information provider's information behaviour, the importance of the information behaviour rests on the assumption that value is being added to the service or product as information workers engage in information behaviour.

The intertwinement of information behaviour and information value is captured in Lai et al's (2009) causal model of information capital and information behaviour and value creation within the context of medical centres in Taiwan. Roosendaal et al (2003) also

depicted the behaviour-value link by arguing that digital information provision in academic institutions comprises the value adding information behaviours of creation, acquisition, certification, disclosure, production, distribution, dissemination and usage. Saracevic and Kantor (1997) also support the information-value link in their arguments that activities do contribute to the value of a whole and that an information service, in providing information to a customer, contributes to the customer being better informed to apply or make decisions with the information. In engaging in a variety of operations such as information collection, indexing, accessing and disseminating to make the customer become better informed, Saracevic and Kantor (1997) argue that the information provider contributes value to the information for the customer. Value is related to terms such as "good, desirable and worthwhile" (Saracevic and Kantor 1997, p. 529) and relates to information, information services and processing, and operations (Taylor 1982).

Taylor (1982) strongly supports the notion of adding value to information when he argues that data are of no use to a customer if processes that add value have not occurred. The processes, according to Taylor (1982, 1986), include selecting, acquiring, organising, storing, retrieving, displaying, analysing and interpreting. Whitehall (1995) similarly states that the processes that add value include selecting, cataloguing, indexing, storing, extracting, filtering, accessing and browsing, which have been shown in this chapter to be subsets of information behaviour. In transforming data to information, Crié and Micheaux (2006) argue that data require to be gathered, structured and transformed by interpreting, formatting and analysis in a timely manner thus resulting in information with value for end-users. Crié and Micheaux (2006) add that it is essential for staff to gain the skill of transforming data into information and accumulating knowledge in the process because this would enable them to provide a more superior customer experience.

Walters and Lancaster (1999) argue that, where there is value of information, there is customer satisfaction. Whitehall (1995) explains that libraries are in the business of adding value to information and adding value to the services they provide, thus resulting in customers using the service they provide.

The arguments about the notions of *added value* and *information value chain* are relevant to the present study because, as the literature indicates, the processes that add value to information and the services provided include information behaviours which the present study aims to explore. This is in accordance with the integrated theoretical framework in chapter 1 which shows that information providers add value to information during the various stages of the information journey from capturing, transforming, and storing, to applying information via value chains.

2.8 Summary

The review of literature has identified several gaps in the literature, some of which will be bridged in the present study. It provides an opportunity to start formulating research questions and research objectives in order to address the statement of the problem described in chapter 1. The structure shown in figure 2.1 for searching for relevant literature has enabled the identification of a plethora of literature from which a small number was carefully chosen for review due to their relevance and approaches adopted for exploring the phenomenon of information behaviour and associated concepts. The selected literature cover the works by a number of distinguished scholars of information science as well as other disciplines such as psychology, management and organisational behaviour.

In contextualising information behaviour, a number of approaches for defining information have been explored in the literature review. The operational definition, in chapter 1, of information as communicated messages that convey meaning captures the objective and subjective properties of information which have resulted in many different, and oftentimes opposing, definitions of information in the literature.

The definitions and descriptions of information behaviour are also numerous and it is evidenced in the literature that almost everyone is engaged in information behaviour of some sort almost all of the time. It was necessary to select and review material that was relevant to the aim of the present study in order to manage the large amount of literature on information behaviour and associated concepts. The gap in the literature is two-fold. First, not much is known about the totality of information behaviour of information providers which includes their thoughts, feelings and behaviours. Secondly, even though most of the studies focus on actors who are external to the information provider, not much is known about the information behaviours of these actors when once information has been sought or acquired. The term 'information use' was used in some of the literature to, perhaps, refer to information behaviours that take place when once information is found. However, the descriptions of the term whenever they were divulged, did not clearly explain the meaning of the term.

The literature however reveals hierarchies or subsets of information behaviour which are related to information seeking behaviours. Wilson's (1999a) nested model of information behaviour also captures two sub levels of information seeking behaviour. By extrapolation, it is safe to conclude that we do not know much about the hierarchies or subsets of other information behaviours beyond the seeking stage although, for competitive information professionals, studies have revealed insights that may be of

significance to the present study. This area also presents a gap which is addressed in the present study that aims to categorise the information behaviour of an information provider.

There are numerous studies of information behaviour is contexts other than information providers. The strength of these studies is that they provide insights into different research designs and different approaches to understanding information seeking behaviour. In addition, the studies recommend further research using multiple modes of data collection which are useful for consideration in the present study. The studies reveal associated information behaviours such as collaborative and multitasking which can all be relevant to all stages of the information journey through an information provider.

A number of studies offer various insights, at times conflicting, into individual demographic influences on information behaviour. The influences are caveated with the fact that there may be hidden factors working simultaneously to influence information behaviour. Some of the demographic variables are relevant to the present study due to the composition of the population such as age, experience, gender and work role.

Developing a model of information behaviour is the ultimate aim of the present study and several models are presented in the literature review. The models reviewed have been selected according to how relevant they are to the theories and models in the integrated theoretical framework in chapter 1. Collectively, they provide insights into various modes and categories of information behaviour as well as feelings, thoughts and emotions that are experienced during and after their information activities. These can help shape the research questions in the present study. Some of the models of information behaviour either reveal very high-level concepts which do not go far enough to reveal individuals' experiences or do not meet the claim that they are general models of information behaviour because of the emphasis on the seeking stage of information behaviour. These are lessons learnt for consideration in the approach of the present study.

The importance of feeling states such as emotion, mood and affect in relation to information behaviour is revealed in the literature. They are important considerations that influence motivation, satisfaction and future behaviours. Caveats to be aware of include the fact that when emotions are experienced as a result of information behaviour and then expedite the path of a feedback loop for future behaviours, there are confounding variables such as personality and mood which may be at play. Also, the research shows that the emotions may be classified as experience of emotions, intensity of emotion and frequency of emotions. A number of key theories of emotion provide insights into the relationship between exposure to an event or activity and cognitive appraisal and interpretation, physiological and physical response, and group emotion, thus capturing

Nahl's (2001) concepts of affective behaviour, cognitive behaviour and sensorimotor behaviour in her behavioural approach to the study of information behaviour. The literature highlights studies on individual demographic influences on emotion and it is found that stereotypes tend to mask the reality in many cases which tend to show that there are no significant influences of individual demographic characteristics of age and gender on emotion. However, the studies note that demographic influences may be masked by confounding variables.

The literature reveals an absence of studies on the impact of provider information behaviour although some of studies focused on the impact of information seeking behaviour of users of information services. The present study aims to reduce this gap as evidenced in the research questions in chapter 3. The other studies that focus on the impact of information or the impact of information services are rich enough to inform the present study's new approach to impact that focuses on the internal environment of the information provider and referred to as *perceived internal impact*.

A number of studies reviewed have shown that, as the information journey progresses through a user, value is added to the information. This becomes relevant to an information provider who provides an information service to customers and aims to ensure that the customers' information needs are met and the customers continue to use the information service. The studies support Cisco and Strong's (1999) value added information chain in the integrated theoretical framework in chapter 1 and show that the activities that comprise information behaviour play a part in providing information which is perceived as having value by the end-user. These considerations are important in the present study that aims to develop a model of information behaviour which should be useful for an organisation during periods of change where a valuable service to customers is to be maintained or improved.

CHAPTER 3: Conceptual Framework and Research Questions

3.1 Introduction

This chapter uses the research aim, integrated theoretical framework and review of literature to develop a conceptual framework for the present study. The research questions and study objectives are also presented and they should help inform a research methodology which is described in chapter 4.

3.2 Conceptual Framework

A conceptual framework not only helps a researcher to develop an understanding of the research problem and generate ideas and research questions, but also provides clear links between current literature and research questions, informs the design of a study, contributes to a study's trustworthiness and influences the appropriate method for a study (Maxwell and Loomis 2003, Smyth 2004, Teddlie and Tashakkori 2009). The conceptual framework presented in the present study can be useful in marking reference points for the multidisciplinary influences and definitional conflicts while assisting in finding a unique location for the concept of provider information behaviour using current literature.

Miles and Huberman (1994) explain that conceptual frameworks show the main things that are to be studied which comprise constructs and variables together with their relationships. Jabareen (2009) adds that concepts are categorised and integrated within the conceptual framework while playing ontological and epistemological roles.

The conceptual framework for the present study is shown in figure 3.1. The main components of the framework are input, activity, outcome and perceived impact which are all derived from the logic model in the integrated theoretical framework. Output is excluded from the conceptual framework because it is not relevant to the research problem described in section 1.2 and also not relevant to the research aim, as described in section 1.4, which focuses on experiences of information behaviour.

The internal information environment

| Input (resources, information demands) | Activities (actions) | Outcomes (feelings) | Impact (perceived) |

Individual characteristics of information workers:
❑ age group
❑ gender
❑ work role
❑ yrs of service

Sources of information

Customers

Clusters of information behaviour:
❑ Seek, get
❑ Transform, edit, organise, analyse
❑ Store, secure
❑ Give
❑ Multitask
❑ Collaborate

Emotions and feelings as outcome of information behaviour

Perceived impact of information behaviour on the internal environment of the information provider

Pragmatism

Figure 3.1 The conceptual framework

The information workers comprise a part of the input domain of the conceptual framework because their collective resources are required to generate the activities that contribute to providing an information service for the customers. The literature has shown that there is conflicting evidence of the influence on information behaviour of demographic characteristics of actors such as gender, personality, sexuality, socio-economic status, culture and race, disability, work experience and age.

It was explained in section 1.5 that measurable individual characteristics such as personality and socio-economic status are excluded from the study as they are not part of the research problem and would distract from the central statement of the problem. While it would be necessary to obtain a profile of the characteristics of the research participants in order to get a better understanding of their reported experiences of information behaviour, some individual characteristics of the population under study such as sexuality, culture and race pose particular ethical problems due to the small size of the study population and the high homogeneity of the population for a number of characteristics as shown in the study location's workforce statistics. It was therefore decided to exclude these variables from the study so as not to capture small numbers and frequencies, thereby potentially identifying individual participants.

The remaining variables from the literature are age, gender, work role and work experience (expressed as years of service). Upon further examination of these variables and discussions with peers, it was decided to use the variable 'age group' instead of 'age' in order as to provide reassurance to research participants in such a small population that outliers would not be identified. The list of individual characteristics for use in data collection is shown in the conceptual framework in figure 3.1 under the input domain.

Sources of information and customers of information are variables within the input domain of the conceptual framework which not only provide context for the information activities of the information workers but are part of the experiences of information behaviour in that the information workers access sources of information to facilitate interactions and they respond to customers' needs by engaging in information activities.

The activities domain of the conceptual framework represents clusters of information behaviour as identified in the literature. The statement of the problem has identified that not much is known about information behaviour once information is sought and, in the particular context of information provider of health information services, no model of information behaviour has emerged from literature searches. Therefore the information activities are necessary for further exploration. The theoretical framework and the literature review have shown that the information activities involve clusters of information behaviours related to capturing (getting), transforming, storing, giving, multitasking and collaborating. The framework provides the opportunity to determine how the information behaviours of the information workers deviate or conform to the clusters of information behaviour types revealed through the literature.

While acknowledging that there are outcomes that are behaviour-related and that they may pertain to those outside the information providing community, the outcome domain in the conceptual framework is limited only to the feelings state of the information workers that emerge during or immediately following information interactions. The important role of feelings is highlighted in the statement of the problem in section 1.2 and the explanation of the aim of the study in section 1.4. In addition, the literature review has shown that feelings are very important considerations in the study of information behaviour due to their influence on future information behaviour. The conceptual framework does not specify any list of feelings because the study is expected to capture and categorise all the experiences of feelings that the research participants reveal.

The impact domain in the conceptual framework is limited to consideration of perceived impact on the internal environment of the information provider. The internal environment

refers to both the people and their teams within the organisation as well as the organisation itself as a whole. Experiences of information workers include their perceptions and, therefore, there is no requirement for an objective impact assessment. Hence the term perceived impact of information behaviour of an information provider in the conceptual framework in figure 3.1. As with feelings, figure 3.1 does not indicate any list of perceptions of impact on the internal environment because the study plans to capture and categorise all perceptions of impact that the research participants reveal.

The word pragmatism is also used in the conceptual framework. The rationale is that, as indicated in chapter 1, the present study adopts the worldview of pragmatism which will therefore not constrain it to a single paradigmatic orientation for the sake of methodological purism because the ultimate research design will be what works for addressing the statement of the problem. The details of the methods and the philosophical assumptions are discussed in chapter 4.

The visual representation of the conceptual framework, with all its variables of interest in figure 3.1, prepares the ground for making decisions about the research questions which are discussed in section 3.3.

3.3 Research Questions

The research questions have been devised in order to meet the aim of the present study described in section 1.4. A number of emerging questions were stated in chapter 2 as the literature was being reviewed which helped inform the conceptual framework. The research questions are developed from the conceptual framework in figure 3.1 and are divided into 3 parts – experiences of actors, influences of demographic characteristics of actors, and the representation of provider information behaviour in a model.

As shown below, the first two research questions (RQ1 and RQ2) have 4 sub-questions each in order to answer the questions fully and ensure that they are within the boundaries of the conceptual framework. If answers are provided to 1a, 1b, 1c and 1d, then research question 1 (RQ1) is answered. Similarly, if answers are provided to 2a, 2b, 2c and 2d, then RQ2 is answered.

The research questions are as follows:

Research Question (RQ) 1
1. What are the experiences of information behaviour of an information provider?
   a. What information behaviours do information workers engage in?

b. Who are the recipients of the information provided by information workers?

c. What feeling states do information workers experience as they engage in information behaviours?

d. What is the perceived internal impact of information behaviours of information workers?

Research Question (RQ) 2

2. Are there demographic differences in information behaviour of an information provider?

a. Is there an age difference in information behaviour of information workers?

b. Is there a gender difference in information behaviour of information workers?

c. Is there a work experience difference in information behaviour of information workers?

d. Is there a work role difference in information behaviour of information workers?

Research Question (RQ) 3

3. How can the categories of information behaviour be depicted in a contextualised model of information behaviour of an information provider?

3.4 Research Objectives

The research objectives emerge from the research questions and Kumar (2005) explains that the objectives are a transformation of the research questions into behavioural terminology.

The research objectives are:

1. To ascertain the experiences of information behaviour of information workers
2. To categorise the experiences of information behaviour of information workers
3. To explore the prevalence of categories of information behaviour in the population of information workers
4. To check for specific demographic influences on information behaviour of information workers
5. To develop a model of information behaviour of an information provider

Table 3.1 shows the relationship between the objectives and the research questions, together with the key outputs that will emerge if all the research questions are answered

and all the objectives are met. The key research outputs start to lay the foundations for details of the paradigmatic orientation and decisions on research methods of the present study which are discussed in chapter 4.

Table 3.1 The relationship between the research questions and objectives

Research questions	Research objectives	Key planned research outputs
1 – a, b, c, d	1, 2	Extracts of experiences of information workers. Categories and hierarchies of information behaviour. Categories of feeling states. Categories of perceived impact of information behaviour.
2 – a, b, c, d	3, 4	Item response frequencies. Associations between specific demographic and information behaviour variables.
3	5	Visual representation of model of provider information behaviour. Description of a model of provider information behaviour.

3.5 Scope of Research

Having reviewed the literature while being mindful of the aim of the present study, it is necessary to articulate what is included in, and what is excluded from, the present study to ensure that the research questions and objectives remain real and valid. The present study focuses on a specific information provider organisation and how the information workers in the organisation experience information behaviour which can be used to develop a model of information behaviour for their organisation. The study therefore focuses on individuals' perceptions, feelings and behaviours that arise as they interact with information in order to provide an information service for customers.

Wilson's (2000, p.49) "totality" in his definition of information behaviour has been shown to influence the construction of the problem statement in chapter 1 which reveals the restriction of most of the extant literature to information seeking behaviour. This makes it not possible to use the current literature to understand the information behaviour of actors in a health information services provider environment. However, it has been necessary to remain within the boundaries of the statement of the problem so as to ensure that the PhD study is manageable and reveals the insights necessary for understanding information behaviour of an information provider.

The present study lies primarily within the discipline of information science but bringing in actors' experiences of feelings and perceptions of impact makes it intersect with other

disciplines such as psychology and organisational behaviour so as to provide a multidisciplinary approach to information behaviour with provider-actors at the centre of it.

The external environment - which includes the interactions with information by users who are external to the provider environment – is excluded from the present study because it is not part of the problem statement. Therefore the information interactions by the customers, whose needs trigger information behaviour of the information provider, are excluded from the research. The present study focuses exclusively on the information workers and their experiences and activities rather than external users who benefit from the information service and who are normally the subject of most empirical studies on information behaviour.

3.6 Summary

A conceptual framework is presented in this chapter which brings focus and direction to the present study. While many variables of interest were identified in the literature review, it has been necessary to limit the number of variables as they were either not relevant to the present study or could have resulted in ethical problems due to the small study population.

The research questions are divided into 3 parts – experiences and categories, influences, and model of information behaviour – which collectively should address the statement of the problem and meet the aim of the present study. Research objectives are identified which are linked to each of the research questions in table 3.1. The key research outputs that are expected to emerge from meeting the objectives are also shown.

The present study is limited to the boundaries of the internal environment of the information provider. Therefore what happens to the information when once it is provided to the customer is outside the scope of the present study as it is not in the problem statement. The study places emphasis on the experiences and activities of actors who interact with information in the internal environment of the information provider within multidisciplinary domains, thus setting the foundations for the paradigmatic orientation of the study which is discussed in chapter 4.

CHAPTER 4: Methodology and Methods

4.1 Introduction

Having presented the research questions and research objectives in chapter 3, this chapter describes and justifies the methodology and methods for guiding the inquiry, including the assumptions and ethical considerations.

The chapter begins with a description of how entry into the research location was achieved even though the researcher and the subjects of the present study work for the same parent employer. Then, the researcher's philosophical stance is presented together with its rationale, benefits and how it serves as the lens through which the research objectives can be met. The design of the mixed methods research is presented together with justifications for the choice of methods for answering the research questions.

To set this chapter into context, it is necessary to re-state the aim of the present study as described in chapter 1. The aim of the present study is to describe, categorise and devise a representation of the experiences of information behaviour of an information provider.

4.2 The research setting

The research setting is Information Services Division's Data Intelligence Group of NHS National Services Scotland, a special National Health Service (NHS) Board in Scotland. Information Services Division (ISD), funded by the Scottish Government, is the only one of its kind in Scotland and has many functions. Its main aim is to "provide health information, health intelligence, statistical services and advice that support the NHS in progressing quality improvement in health and care and facilitate robust planning and decision making" (ISD Scotland 2010). By so doing, ISD maintains national datasets and a corporate data warehouse that contains national health activity data. ISD has also formed partnerships with health and care service provider organisations such as the other NHS Boards, general practitioners, voluntary organisations, local authorities, community pharmacies, dental and ophthalmic practitioners to ensure that the information collected is well managed, supported and up-to-date.

The research setting was chosen because no studies on information behaviour have been done on this type of information provider organisation. Similar organisations exist in England, Wales, Northern Ireland and Scandinavian countries although they tend to have a narrower scope and their functions spread over more than one organisation. Initial consideration was given to replicate the study in a similar organisation in one of the other countries in order to enhance triangulation but the resources in terms of time and finance

available to the researcher would not have permitted this. The final and pragmatic decision was to focus on information behaviour in ISD. With the research focusing on ISD, it provides an opportunity to understand what goes on in ISD, not only in terms of information activities but also the human dimensions with regard to feelings, emotions and perceptions. These are important markers to consider when making decisions that affect workload, work flow and quality of work in an organisation that has to continually evolve to meet the demands of new ways of providing care.

4.2.1 Getting past the gatekeepers

To start finalising the research proposal which underpinned the present study and which would involve engaging the information workers in research activity, it was necessary to have face-to-face discussions with both the information workers' most senior manager and the Caldicott Guardian to discuss the draft research proposal and explore any issues that may arise thereof. They are referred to as the gatekeepers who are influential, in positions of power and can grant or refuse access to research subjects (Wanat 2008). Granting access does not mean that cooperation at participant level is assured because each individual research participant would require to give their informed consent. Caldicott Guardians, set up in Scotland in 1999, are usually clinicians and senior key figures present in all NHS organisations responsible for the safeguard of all patient data in their organisation and they use a complex framework of legislation, non-statutory codes of practice and protocols to support their work and decision-making (Caldicott Guardians 1999). The Caldicott Guardian, at that time, also had responsibility for governance of research.

From the discussions between the researcher and both the Caldicott Guardian and the senior manager, it was clear that, as the research pertaining to the present study did not involve any clinical or patient related information, there was no requirement to apply for permission to the NHS Scotland Research Ethics Committee because of the absence of a relevant ethical issue. The ethical considerations for the present study are further discussed in section 4.8.

The discussions with the gatekeepers resulted in the following mutually agreed four rules of engagement with the field:

- Observation as a research method is not permitted
- Data collection should be minimally intrusive to the research subjects
- Disclosure control should be applied where necessary to ensure confidentiality
- The research ethics policy of Robert Gordon University should be adhered to

Observation was not permitted because some groups of information workers work within a 'red zone' where they interact with sensitive data and as such individuals not belonging to these groups were only allowed to enter the 'red zone' for short periods of time and for a specific purpose. Minimal intrusion was necessary because of the information workers' workload and their need to be available to respond to the needs of customers.

The information workers are very experienced in applying disclosure control to the data they interact with to ensure that the confidentiality of the data is not compromised. Disclosure control methods include collapsing cells of data when numbers are small and redacting segments of texts to ensure confidentiality. There was therefore an expectation that the researcher, being an employee of the same parent organisation as the research subjects, would ensure disclosure control to protect the confidentiality of the research subjects. This situation is consistent with Cooper, Lewis and Urquhart's (2004) study of information behaviour of hospital pharmacists where the researcher was a member of staff of the research location and as such was bound by staff codes of conduct on confidentiality which resulted in straightforward permission to proceed with collecting data from the pharmacists. There was an expectation from the gatekeepers that the researcher would comply with Robert Gordon University's ethics policy, which is further discussed in section 4.8.

In response to a question posed to the gatekeeper about how the activities in ISD could be summarised in a few words, the response was that data or information are accessed or received by the employees, and then they go through a series of processes before becoming available to the customer. This response thus helped with deciding how to approach the problem which was discussed in chapter 1.

With these boundaries firmly set for the present study, the components were starting to become apparent that would shape the finalised design of the study.

4.2.2 Characteristics of the information workers

The population of information workers has a lot of experience of participating in research. One reason is that students, both from within the workforce and outside of the workforce, doing undergraduate and post graduate courses in various disciplines would normally engage staff in both qualitative and quantitative research. Also, it is customary for the management of the organisation to disseminate annual staff survey questionnaires or ad hoc survey questionnaires to capture staff's experiences of, for example, a new software application or the views of their employer. There would also be the occasional group sessions to capture ideas for developing, for example, a new strategy. It was therefore

clear to the researcher that there would be competition from other research activities to maximise engagement of information workers in the present study.

Some work roles were excluded from the community of information workers in order to create the boundaries of who falls within the scope of an information worker as described in section 1.3. Administrative, secretarial, and staff development employees were all excluded. Also excluded were the very few staff who were not available because they had been on secondment to external organisations for many years which included the duration of the present study. Of those that remained the breakdown was as shown in Table 4.1. The names of the original teams are (1) waiting times information, (2) analyst, (3), data quality assurance, (4) data monitoring, (5) information governance, (6) data standards and terminology, (7) women and children, (8) health and social care information, and (9) practice team information.

Table 4.1 Breakdown of teams of information workers

Work area	Code	Number of information workers
Waiting Times Information and Analyst Teams	Team A	25
Data Quality Assurance and Data Monitoring Teams	Team B	14
Information Governance and Data Standards and Terminology Teams	Team C	16
Women and Children Information Team	Team D	17
Health and Social Care Information and Practice Team Information Teams	Team E	9
TOTAL		81

In Table 4.1, Teams (work areas) are merged and coded as Team A, B, C, D and E. This is because some teams comprise very few people – which could potentially compromise anonymity – and, due to similarities in work function, teams (work areas) were easily grouped together as shown in Table 4.1. Grouping similar work functions together was not difficult because some work areas had staff with similar job descriptions, handled similar range and type of information but interacted with different customers. The numbers of information workers were obtained from each of the team leaders. The groupings and numbers of each were included in the draft proposal that was submitted to the most senior manager for review. The total number of information workers in the population of interest at the time of data collection for the present study was 81.

The role boundaries of the information workers in ISD are generally clear. Giddens (1984) proffers a useful theory – the theory of structuration – to describe how a system is set up, which can be applied to ISD. Giddens (1984) sets out a description of structure as comprising rules and resources with rules being the operating procedures and guidelines which may or may not be written down, and resources being the technology, expertise, other individuals and infrastructure for facilitating work within the system. In introducing the term, *duality of structure*, Giddens (1984) explains that structures make social action possible and that social action creates the structures. That is, the rules and procedures within a system result in individuals engaging in behaviours. In addition, the expertise, knowledge and skills of the individuals together with their behaviours make up a structure. This description provides a picture of how ISD is set up. The teams in ISD work within the boundaries of their operating procedures and guidelines and continually interact with each other to provide a highly valued information service.

4.2.3 Researcher's experience

The researcher had gained previous experience working in two of the teams shown in table 4.1. The ethical implications of this are discussed in section 4.8. The course of study leading to the preparation of this thesis commenced in January 2007 during which the researcher was an information worker working amongst colleagues who would eventually become research subjects. On 1st January 2008, data collection had not yet commenced and the researcher was moved to another part of the organisation not covered by the present study in a completely new role. This created some distance between the researcher and those who were to become research subjects. This situation resolved potential ethical issues.

4.3 Philosophical assumptions

The philosophical framework for the present study has been influenced by a number of assumptions, beliefs and personal value system of the researcher and driven by the content of the research questions. The philosophical framework is shown in appendix 1 and the details are explained throughout this section. Wilson (2002) explains that it is essential for there to be a philosophical framework that sets out the world view of the researcher and the reasons for the methods so as to ensure that the methods are well grounded and justified.

Budd (2005) argues that much of the literature in information science is sceptical about philosophical approaches and adds that incorporating philosophical approaches in research helps improve practice by learning from people's views of reality and what is perceived to be the truth.

4.3.1 Pragmatism

Pragmatism, the paradigmatic orientation of the present study, allows for personal values of the researcher, such as integrity, respect, loyalty and responsibility, to influence the way in which the topic of interest is studied. Saunders, Lewis and Thornhill (2009) assert that, in pragmatism, the research questions determine the epistemology, ontology and axiology that should be adopted in the study. Pragmatism and its relationship with mixed methodologies began to emerge in the 1960s, and becoming popular in the 1980s and 1990s, following the dominance of positivism since prior to the late 19th century (Onwuegbuzie 2002).

The research questions, as explained in chapter 3, are divided into 3 parts – (i) experiences and categories, (ii) influences and (iii) model development. These types of questions allow the researcher, within the philosophy of pragmatism, to use multiple philosophies and/or multiple methodologies in order to find the most workable solution for answering the research questions. The following example illustrates the researcher's choice of pragmatism in the present study. In trying to make sense of an actor's experiences of information behaviour, an inquirer would need to understand and interpret the actor's experiences of the phenomenon. In doing this, the inquirer would need to get close to the actor to get a deeper understanding. In getting close to the actor, the personal values of the inquirer start to interfere with the relationship. However, in trying to build a picture of the actor's information behaviour together with the categories necessary for developing a model, the inquirer would need to be cognisant of Wilson's (2000) concept of *totality* in his definition of information behaviour which is explained in section 1.3.2 (chapter 1). In being cognisant of this, the inquirer would want to test whether factors may be influencing the phenomenon of information behaviour. Also, with the actor being part of a team which, in turn, is part of an organisation with several teams, without exploring what else is going on that is relevant to information behaviour, an understanding of the phenomenon of information behaviour to facilitate the development of a model would not be complete. Pragmatism therefore offers the inquirer an opportunity to adopt a worldview in which it is acceptable to adopt multiple methodologies to help build a workable model of information behaviour that is trustworthy to the actors, the inquirer and the reader of the present study.

The research questions and the philosophy of pragmatism allow both biased and unbiased perspectives to permeate the research design although the researcher upholds the view that no aspect of the design can be 100% unbiased. Onwuegbuzie and Leech (2005a) capture this argument very well by stating, in an example, that if an instrument which has been developed can lead to scoring in an objective manner, then there have

been subjective decisions in all stages of the development of the items in the instrument and therefore:

> "SUBJECTIVITY + OBJECTIVITY = SUBJECTIVITY" (Onwuegbuzie and Leech 2005a, p. 377).

Onwuegbuzie (2002) refuses to agree with positive purists who claim that their techniques are objective. According to Onwuegbuzie (2002), when positivists use 5% significance as a ritual test of the hull hypotheses, they fail to realise that using the value of 5% is a subjective decision which has been influenced by it being an adopted standard; but a 4% or 6% significance could easily suffice, a view also adopted by Cohen (1997). However, Onwuegbuzie (2002) warns purists with an anti-positivist stance that they should accept that their conceptions of viewpoints within their context may be false in other frameworks and therefore they should accept the positivists' conceptions of truth as true within their own terms.

Onwuegbuzie (2002) suggested an epistemological continuum as a way of achieving epistemological ecumenism. A diagram representing the continuum is adapted from Crotty (1998) and Onwuegbuzie (2002) and is shown in figure 4.1.
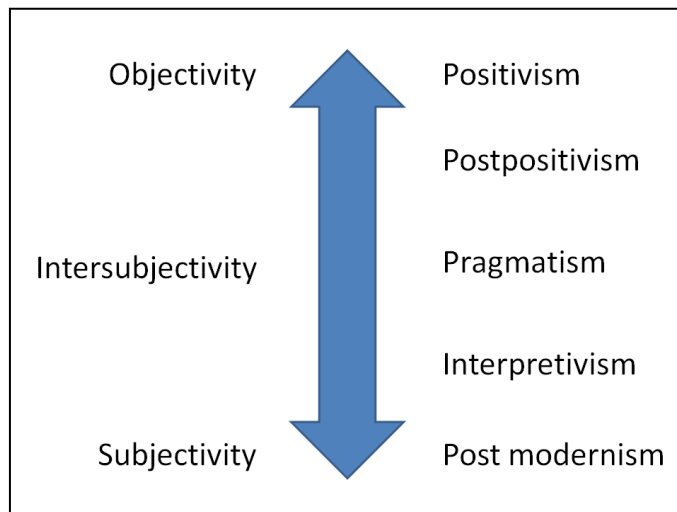
Figure 4.1 Paradigm continuum

(Adapted from Crotty 1998 and Onwuegbuzie 2002)

In figure 4.1, the paradigms are shown on the right hand side. They are not exhaustive as they are meant to show the relative positions of the key paradigms that require consideration in the articulation of the researcher's worldview.

On one end of the continuum in figure 4.1 is positivism. Positivism is the belief that there is a single reality which exists independent of the values and influences of a researcher. Positivism has been criticised for its portrayal of superiority and purism. It has also been criticised, according to Guba and Lincoln (1994), for its findings in inquiries that are generalised in a form that is free of context. According to Crotty (1998, p. 27), "positivism is objectivist through and through" which explains why positivism is at the same point on the continuum as objectivity and does not tolerate subjectivity.

Postpositivism arose as a result of dissatisfaction with positivism and departs from the tenets of positivism by recognising that it is impossible to prove the absolute truth of research findings. Postpositivism also upholds the idea that the values of the researcher may influence an inquiry and that it is necessary to validate the findings to mitigate possible influences (Teddlie and Tashakkori 2009). Validation of findings may include a choice of several methods such as triangulation and, according to Torrance (2012), respondent validation. Racher and Robinson (2003) explain that, because postpositivism accepts that claims about universal reality may need to be verified by those experiencing the reality, postpositivism may encompass interpretive/constructive methodologies such as phenomenology, grounded theory and ethnography. Trochim and Donnelly (2006) explain that postpositivism accepts the notion that scientific and common sense reasoning differ only by degree but are essentially equal. According to Onwuegbuzie and Leech (2005b, p. 269) postpositivists believe "that reality is constructed, research is value laden and…some relatively stable relationships exist". Teddlie and Tashakkori (2009, p. 69) add that it is "currently the predominant philosophy for quantitative research in the human sciences". One of the tenets of pragmatism, which is in the centre of the continuum, is that it accepts the notions of both single reality and multiple realities (Onwuegbuzie 2002). This makes the tenets of postpositivism sit comfortably beside the philosophy of pragmatism.

Pragmatism is in the middle of the continuum in figure 4.1. This does not make it pure and distinct from the paradigms on either side of the continuum. Morgan (2007) explains that pragmatism captures the duality of going back and forth between subjectivity and objectivity, depending on the stage of research, which he refers to as intersubjectivity. Therefore pragmatism accepts the presence of paradigms from either side of the continuum in a single study.

Figure 4.1 shows interpretivism on the opposite side of postpositivism close to one end of the continuum. Interpretivism is closely linked to constructivism, which is not shown in the diagram. Whereas constructivism strives to achieve a consensus of reality amongst the research subjects (Guba and Lincoln 1989), interpretivism allows a researcher to form an

understanding (or interpretation) of the meanings that the research subjects give to their socially constructed reality (Gray 2009). This is echoed by Sandberg (2005) who states that interpretivism enables an understanding of the lived experiences of reality. Willis (2007) explains that, in interpretivism, "what the world means to the person or group being studied is critically important to good research in the social sciences" (p. 6). In addition, case studies, interviews and observations are methods by which a researcher can understand people's views of their reality (Willis 2007). Although interpretivism and postpositivism are different paradigms on opposite sides of the epistemological continuum, Racher and Robison (2002) argue that there is nevertheless some degree of congruence between both interpretivism and postpositivism when their ontological, epistemological and methodological assumptions are compared. The present study, adopting the philosophical lens of pragmatism, accepts the assumptions of both interpretivism and postpositivism, as shown in appendix 1, in order to provide a solid base for the research methods which aim to capture the reality as perceived by the research subjects and augment their multiple realities with a single reality of the phenomenon of information behaviour by the population to which the research subjects belong.

Postmodernism is firmly based on subjectivity and upholds the idea that objectivity does not exist. Matthewman and Hoey (2006) admit that it is difficult to define. Teddlie and Tashakkori (2009) explain that there are many versions of postmodernism and that some schools of postmodernist thought are completely opposed to the research process, which makes it difficult for pragmatism to accept. The concerns of the scientific community are captured by Cosgrove (2004) who argue that "adopting a paradigm that challenges the very notion of achieving scientific truths about human experience" is worrying. On the other side of the argument, Fielding (2009) has argued that some elements of moderate versions of postmodernism can produce insights that can be reconciled with mixed methods research.

To address the research questions for the present study, both inductive and deductive logic are used and Teddlie and Tashakkori (2009) and Creswell and Plano Clark (2007) argue that pragmatism can allow us to do this. This process of using inductive and deductive logic is known as abductive reasoning which can be employed, for example, to "further a process of inquiry that evaluates the results of prior inductions" (Morgan 2007, p. 71). The classical pragmatist, Charles Peirce, argued that strict induction or deduction cannot unmask the structure of meaning (Peirce 1878a) and so, as stated by Yu (1994), the logic of abduction fits well into pragmatism. The application of abductive reasoning is therefore used in the present study.

Johnson, Onwuegbuzie and Turner (2007) argue that there are 3 types of pragmatism. The pragmatism of the right upholds a weak pluralism and a strong realism. The pragmatism of the left upholds a strong pluralism and antirealism. Johnson, Onwuegbuzie and Turner's (2007) preferred option is pragmatism of the middle which is what is adopted in the present study. It upholds pluralism and realism, is based around the ideas of classical pragmatism, by the philosopher Peirce and later on by James and Dewey, and supports the peaceful coexistence of mixed research with the "philosophies of quantitative and qualitative research" (Johnson, Onwuegbuzie and Turner 2007, p. 125). Johnson and Onwuegbuzie (2004) and Creswell (2009) explain that the pragmatism of the middle has the following characteristics:

- Offers a middle ground and a workable solution to philosophical dualisms
- Upholds the reality of the actions of human experience
- Knowledge is based on the reality of the world and the constructions of people
- Supports eclecticism and pluralism – the doors are open to multiple worldviews and multiple methods
- Endorses empiricism
- Views truth as not being constant over time
- Does not believe in absolute truth
- Does not believe that the world is an absolute unity
- Endorses the freedom of methodological choices

Goldkuhl (2004) argues that pragmatism has a clear foundation in empiricism and that a growing interest in pragmatism in organisational and informational studies has now resulted in researchers not being restricted to choosing either a positivistic or anti-positivistic stance. Pragmatism, according to Creswell (2003), assumes freedom of choice, the world is not an absolute unity, truth is what works at the time, and is not committed to any one system of reality. "Pragmatism finds a middle ground between philosophical dogmatisms and scepticism and a workable solution to many longstanding philosophical dualisms about which agreement has not been forthcoming" (Johnson and Onwuegbuzie 2004, p.18). Pragmatism is a well-developed and attractive philosophy for integrating perspectives and approaches and offers epistemological justification and logic (Johnson, Onwuegbuzie and Turner 2007).

Onwuegbuzie and Leech (2005a) highlight several advantages of pragmatism in research. They include flexibility of techniques, collaborations among researchers orientated to different paradigms, holistic research endeavour, use of quantitative data to augment qualitative findings and vice versa, and the ability to combine issues at macro

and micro levels. Creswell (2009) argues that pragmatism allows consideration of different worldviews, assumptions, data collection and analysis techniques.

There have nevertheless been concerns about pragmatism. Johnson and Onwuegbuzie (2004) explain that many philosophers have contended that pragmatism only offers a practical solution and not a logical solution to the philosophical disputes such as the opposing assumptions of interpretivist and positivist paradigms. In addition, Johnson and Onwuegbuzie (2004) explain that qualitative and quantitative purists have always rejected each other's philosophical stance with each one positioning their worldview as being more superior; so it is hardly surprising that pragmatism is subject to criticism. Therefore, Johnson and Onwuegbuzie (2004) assert that pragmatism offers that bridge between conflicting philosophies and is continuing to grow and become popular in research studies since it enjoys the best of both parts of the paradigm debate.

The research questions also allow for two phases of the research to take place and these are described in sections 4.5, 4.6 and 4.7. Phase 1 of the study takes the philosophical stance of interpretivism and phase 2 takes the philosophical stance of post-positivism. These are described in sections 4.3.5 and 4.3.6 respectively. Pragmatism in this study serves as the bridging mechanism for the dualism of interpretivism and post-positivism.

4.3.2 Ontology

"Ontology is the nature of reality, being, and truth" (Teddlie and Tashakkori 2009, p. 86). The present study supports Johnson and Onwuegbuzie's (2004) assertion that truth, meaning and knowledge are not constant; they change over time and, in the meantime, we live by provisional or instrumental truths. The pragmatic paradigm allows the present study to accept both the notion of multiple realities that are specific to the actors who hold them and also that there may be a reality which can never be fully understood and best checked with those who contribute to this reality in order to give it some credibility.

4.3.3 Epistemology

Epistemology is the relationship between the inquirer and the subjects (Teddlie and Tashakkori 2009). The present study is epistemologically intersubjective and it serves as the foundation for the researcher's methodological position. Intersubjectivity represents the relationship between the inquirer and the research process in order to gain knowledge about reality (Morgan 2007). Morgan (2007) argues that the classical pragmatic emphasis on an intersubjective approach captures the duality of having to work back and forth between the dichotomies of subjectivity and objectivity as it is assumed that it is impossible to achieve complete objectivity or complete subjectivity.

4.3.4 Choosing the methodology

"Methodology is the overall approach to research linked to the paradigm" (Mackenzie and Knipe 2006, p. 6). However, before revealing the methodology of choice, it is worth noting that the research questions in the present study are such that they require the research design to place an emphasis on the descriptive (*what* is going on?) rather than the explanatory (*why* is it going on?) (De Vaus 2001).

Creswell and Plano Clark (2007), Teddlie and Tashakkori (2009), Morgan (2007), Green (2008), Johnson and Onwuegbuzie (2004) and Onwuegbuzie and Leech (2005b) are leading world scholars in mixed methods research who have endorsed pragmatism as the worldview for mixed methods research which the present study embraces.

Johnson, Onwuegbuzie and Turner (2007) define mixed methods research as:

> *"an intellectual and practical synthesis based on qualitative and quantitative research; it is the third methodological or research paradigm (along with qualitative and quantitative research). It recognizes the importance of traditional quantitative and qualitative research but also offers a powerful third paradigm choice that often will provide the most informative, complete, balanced, and useful research results"* (Johnson, Onwuegbuzie and Turner 2007, p. 129).

According to Leech and Onwuegbuzie (2009), mixed methods research as a research design choice is growing but could be confusing to researchers who are new to mixed methods especially as there are many types of mixed methods designs from which to choose.

Creswell and Plano Clark (2007) explain that the research questions are the key to determining the type, if any, of mixed methods design and outlines a number of situations that support a preferred approach of mixed methods. Two of Creswell and Plano Clark's (2007) situations are presented below and the research questions allow them to be applicable to the present study:

- *"A need exists for both quantitative and qualitative approaches"* (Creswell and Plano Clark 2007, p. 32) – RQ1 in the present study focuses on the experiences of actors' information behaviour and RQ2 focuses on demographic differences in information behaviour. In the absence of any single instrument for capturing these sets of variables from information workers, a suitable approach is for the researcher to use a qualitative methodology for determining the experiences of subjects and a quantitative methodology for capturing the influence of

demographic variables. Creswell and Plano Clark (2007) explain that a more complete picture of the phenomenon is developed by combining qualitative and quantitative approaches because subjects' perspectives are combined with general trends and new evidence in the population in order to tell a more complete story.

- *"A need exists to enhance the study with a second source of data"* (Creswell and Plano Clark 2007, p. 33) – In the present study, whereas RQI focuses on subjects' experiences, RQ3 focuses on the development of a model of provider information behaviour. Therefore, if a model should be as comprehensive as possible so that it will have features that may be transferable to other settings, useful for LIS curriculum and make an original contribution to knowledge, then a second data collection exercise to build upon the captured experiences of the interview subjects becomes necessary. Creswell and Plano Clark (2007) explain that quantitative data can be useful for enhancing the themes and categories obtained from qualitative approaches.

Using Greene, Caracelli and Graham's (1989) rationale for conducting mixed methods research, the mixed methods research approach in the present study will facilitate (i) complementarity – that is, the enhancement of results of the qualitative phase with results of the quantitative phase and (ii) development – that is, the use of findings of the qualitative phase to help develop the quantitative phase.

There are a small number of LIS studies which have successfully applied mixed methods research to (a) get a full picture of the phenomenon under study, or (b) enhance the findings of the main research approach, or (c) provide context for quantitative findings, or (d) first explore qualitatively and then confirm quantitatively. The approaches include mainly interviews and surveys together with, at times, diaries, observations and document analysis. Examples of such studies include information behaviour of healthcare professionals (Ramos et al 2003, Cooper, Lewis and Urquhart 2004), academics (Bass et al 2005), farm workers (Fisher et al 2004), engineers (Kwasitsu 2003), agricultural scientists (Majid, Anwar and Eisenschitz 2000), artisans (Mooko and Aina 2007), clergy (Wicks 1999), and students (Boadi and Letsolo 2004, Makani and WooShue 2006, Banwell and Gannon-Leary 2000).

Fidel (2008) analysed 465 research articles in major LIS research journals, found that only 22 articles employed mixed methods research (MMR) leading him to the conclusion that mixed methods research (MMR) as a concept is not common in LIS. Fidel (2008) also found that MMR is missing from most research methodology books which tend to focus on only qualitative and quantitative approaches. Against this background, it is

recommended that "we should no longer distinguish quantitative and qualitative research but strive towards methodological pluralism" (Onwuegbuzie and Leech 2005b, p. 268). This is supported by Early (2007), Niglas (2006) and Christ (2009) who recommend that all graduate students' curricula should include the teaching of MMR. To provide the evidence for this, Christ (2009) carried out a longitudinal mixed methods case study to determine the effects of introducing mixed methods research teaching into the curriculum of education students in the University of Hawaii as an alternative to single methods courses. Christ (2009) found that, as a result of the introduction of the new curriculum, the quality of students' proposals and dissertations was significantly improved. Accordingly:

> *"students made excellent progress when they followed seven basic steps: (a) creating an introduction that defined the topic; (b) writing a problem statement identifying the importance of the topic, backed by citations and applicable statistics; (c) creating a purpose statement identifying the intended audience and why the study is being conducted; (d) reviewing literature that introduces, aligns, and justifies the topic, intervention, or theory (beginning, middle, and/ or end) and provides a justification of exploratory, explanatory, confirmatory, action oriented, critical, or transformative design; (e) composing an overarching mixed methods research question with qualitative and quantitative subquestions; (f) composing a clear methodological statement with accompanying research diagram; (g) designing replicable procedures including (i) the role of the researcher, (ii) how the study is "bound," (iii) quantitative and qualitative data sampling, collection, analysis, and merging procedures, and (iv) steps supporting credibility/reliability and potential for generalization" (Christ 2009, p. 316).*

The recommendations by Christ (2009) can serve as a guide when the nature of the research questions is such that mixed methods research can be applied. In the present study, with MMR being suitable for addressing the research questions, it is expected that the methodology and methods presented in this chapter will add to the LIS body of knowledge which, as argued by Fidel (2008), does not tend to label its mixed methods studies as MMR and incorporate mixed methods theory.

It is widely accepted that, in mixed methodology literature with both qualitative and quantitative approaches, notations are used to represent emphasis and timing of the qualitative and quantitative components. Figure 4.2 shows the continuum of qualitative, mixed methods and quantitative research.
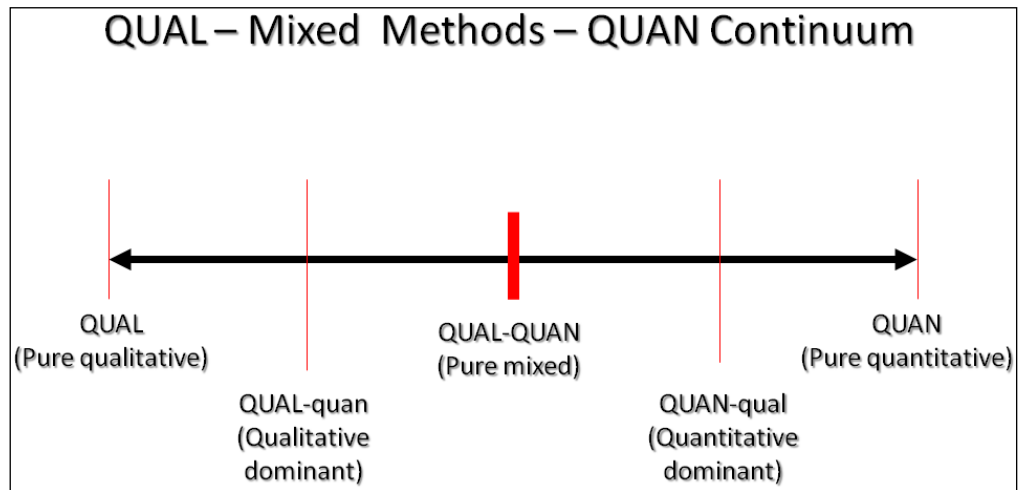
Figure 4.2 Qualitative – mixed methods - quantitative continuum

(Adapted from Johnson, Onwuegbuzie and Turner 2007, p. 124 and Teddlie and Tashakkori 2009, p. 28)

As shown in figure 4.2 above, research can involve qualitative or quantitative approaches or a combination of both mixed in various proportions. According to Morse (2003) an arrow (→) or a cross (+) is used to connect QUAL, QUAL, qual and quan to form sequential and concurrent designs as follows:

- QUAN+QUAL: Concurrent mixed methods research with equal emphasis on qualitative and quantitative designs
- QUAN+qual: Concurrent mixed methods research with a dominant quantitative design and a less dominant qualitative design
- QUAL+quan: Concurrent mixed methods research with a dominant qualitative design and a less dominant quantitative design
- QUAN→QUAL or QUAL→QUAN: Sequential mixed methods research with equal emphasis on qualitative and quantitative designs
- QUAN→qual or qual→QUAN: Sequential mixed methods research with a dominant quantitative design and a less dominant qualitative design
- QUAL→quan or quan→QUAL: Sequential mixed methods research with a dominant qualitative design and a less dominant quantitative design

Johnson and Onwuegbuzie (2004) and Lopez-Fernandez and Molina-Azorin (2011) argue that a researcher should not be restricted to the two-phase qualitative-quantitative designs that are usually presented in mixed methods research textbooks and that, in particular, the sequential mixed methods research designs may comprise three or more phases.

For concurrent designs, the phases of the study are carried out at the same time or approximately at the same time. Data collection in one phase is not dependent on data collection in the second phase and the design is usually carried out for the purposes of triangulation or as a result of how the research questions are structured. Concurrent designs are more suitable for a team of researchers who have the resources to collect data concurrently although the research questions should determine whether a concurrent design should be adopted.

For sequential designs, data collection for the 2nd phase of the design commences after data collection for the 1st phase of the research is complete. Usually the findings of the 1st phase are connected to the 2nd phase by the development of a typology or an instrument or the generation of hypotheses that need to be tested. Sequential designs are most suitable for single-handed researchers who do not have the manpower resources to carry out data collection concurrently although the research questions should determine whether a concurrent design should be adopted.

For the present study a combination of the research questions, the limited manpower resources of the researcher, and the worldview of the researcher lend themselves to a study which is of mixed methods sequential exploratory design comprising a more dominant qualitative phase (QUAL) followed by a less dominant quantitative phase (quan). This is known as a qualitatively driven mixed methods design (Morse and Niehaus 2009). With reference to table 3.1 (chapter 3), it is planned that the qualitative phase should meet research objectives 1, 2 and 5 and that the quantitative phase should meet research objectives 3, 4 and 5. Further details of the choice of qualitative and quantitative components of the mixed methods design are discussed in sections 4.3.5 to 4.3.7. However, the phases of the research are summarised and visually represented in figure 4.3 below.
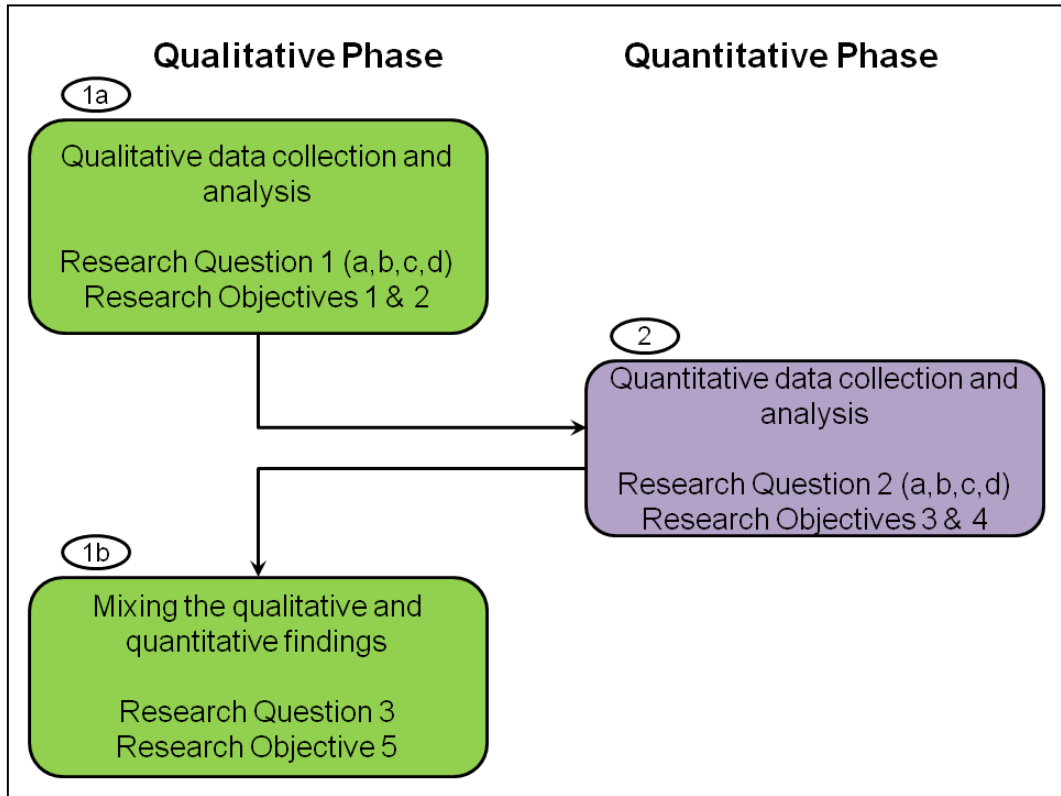
Figure 4.3 Research phases in relation to research questions and objectives

Figure 4.3 is a continuation of table 3.1 (chapter 3). It shows that the qualitative phase 1 comprises two parts – 1a and 1b. Phase 1b brings together the findings of phases 1a and 2 in order to develop the model of information behaviour and thereby answer RQ3 and meet research objective 5. Phase 1 is described in sections 4.3.5, 4.5 and 4.7. Phase 2 is described in sections 4.3.6 and 4.6.

4.3.5 Methodology and design for phase 1

With interpretivism being the philosophical lens for phase 1 of the present study as explained in section 4.3.1, there are a few qualitative design options available to the researcher. They include case study, ethnography, discourse analysis, phenomenology and grounded theory. Bearing in mind the research questions, it was necessary to compare the five design options as shown in Table 4.2 in order to choose and justify the most suitable qualitative design for the present study.

Table 4.2 Key qualitative design options

(Adapted from Johnson and Christensen 2012, Aldiabat and Le Navenec 2011, Yin 2009, Starks and Trinidad 2007, Fairclough 2001, Budd and Raber 1996)

	Case Study	Ethnography	Discourse Analysis	Grounded Theory	Phenomenology
Purpose	To understand and describe 1 or more cases in depth.	To understand and describe the realities of the culture of a group of people.	To understand how people use language to create meaning and construct their reality.	To generate theories and explanations that are grounded in the data.	To understand how 1 or more persons experience a phenomenon.
Philosophical orientation	Interpretivism	Interpretivism	Interpretivism	Interpretivism	Interpretivism
Subjects	1 or more person(s), group(s), or process(es).	Group or groups of people.	Transcribed interviews. Sample size not an issue.	Large numbers of people selected until saturation is reached (usually 20-30).	1 or more persons (usually up to 10).
Data collection	Interviews, observations, documents.	Participant observation, interviews, literature can be consulted prior to data collection.	Interview transcripts, texts, images.	Interviews, observations, diaries, literature usually not be consulted prior to data collection.	Interviews, literature is consulted prior to data collection.
Data analysis	Description of cases, common themes, differences between cases.	Cultural themes and their descriptions.	Identification of themes, semantic and syntactic features of text, traces and cues in the discourse, explain how discourse is determined by structures and relations.	Open, axial and selective coding; theoretical saturation; constant comparative strategy.	Significant statements, cluster themes into categories, essence of phenomenon.
Elements of final report	Description of the case and its context.	Full description of culture and context of the subjects under study.	Description of how discourses produce social reality in context.	Presentation of the grounded theory and its description.	Thematic description of statements that represent the experience.

A case study is "an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin 2009, p. 18) and can be descriptive, exploratory or explanatory. Case study approaches have been used successfully in library and information science research. One very relevant example is a case study by Hyldegård (2009b) that aimed to capture the information seeking and work activities of 3 groups of LIS students during the process of writing up a project assignment over a 14-week period. Hyldegård (2009b) used questionnaires, diaries and interviews to capture the data. This is supportive of Yin's (2009) assertion that findings and conclusions in case studies are most convincing when multiple sources of information are used. The research questions in the present study allow for a case study approach to be used. The methodological freedom for conducting and reporting a case study also make it a suitable approach for the present study. However, the present study would have adopted a case study approach that involved observations to capture real-time behaviour, interviews to capture perceptions, questionnaires to capture demographic data and diaries to capture real-time thoughts, feelings and emotions, were it not for the rules of engagement that were set out for the researcher during the preliminary discussions to gain entry to the research location that focused around minimal subject intrusion (which

would not permit diaries) and respect for the subjects' interactions with sensitive data and information (which would not permit observations).

Ethnography is about telling a story about people using a "cultural lens to interpret observed behaviour, ensuring that the behaviors are placed in a culturally relevant and meaningful context" (Fetterman 2010, p. 1). Hammersley and Aitkinson (2007) add that ethnography involves participating in people's natural setting for an extended period of time whilst watching and listening to interactions, asking questions and collecting material to add to the range of data collection types. In so doing the researcher's role becomes that of a co-participant rather than having a researcher-subject divide. The literature on LIS has accommodated ethnography as a research design. On example is McKnight's (2006) participant observation study of 6 critical care nurses where the researcher was dressed as a librarian member of staff and gathered 50 hours of data in the form of observations, field notes and interviews. Cooper, Lewis and Urquhart (2004) also carried out participant observation of 7 home care receivers and 6 hospital pharmacists in order to explain information behaviour. As table 4.2 shows, ethnography has an emphasis on culture and participant observation. It would not have been possible to engage in participant observation in the present study as a means of collecting data due to the rules of engagement from the gatekeeper. In addition, the research questions did not require an understanding of the culture of ISD but instead focused on the understanding of individuals' experiences of information behaviour. Against this background, ethnography was not selected as the approach of choice.

Discourse analysis focuses on the use of language within texts or transcribed interviews that contribute to a construction of social reality. Therefore, discourse analysis, according to Talja (1999, p. 460), "does not aim at capturing participants' authentic intentions, meanings and experiences. … It concentrates on the analysis of knowledge formations, which organize institutional practices and societal reality on a large scale". Discourse analysis has been used in LIS literature especially in areas related to communications media and technology (Budd and Raber 1996) but not widely in information behaviour research. One relevant example is Ellis et al's (2002) study of the information seeking behaviour of academic researchers during a mediated interaction with an information retrieval system. The unit of discourse analysis was the utterance between the subject and the intermediary. As a result of the emphasis of discourse analysis on the linguistic expression of subjects' transcribed interviews rather than the content of the interview which can reveal subjects' inner realities and experiences, it is not a suitable design to employ in the present study for answering the research questions. This is because the research questions focus on experiences of individuals, categories of information behaviour and associations between individual characteristics and information behaviour.

The data for discourse analysis "is talk; not what the talk refers to, but the talk itself" (Frohmann 1994, p. 120). Therefore attempting to cluster themes of information behaviour, feelings and emotions into categories would not work best with discourse analysis.

In Grounded theory, a theory which is grounded in the views of the subjects is developed. Charmaz (2006) explains that, whereas most qualitative methods allow the researcher to exert some degree of freedom in the analysis stage, when once the data are collected, grounded theory proffers a set of guidelines for a researcher to adhere to in order to increase the validity of the data interpretation. Grounded theory was developed by Glaser and Strauss (1967) but a rift occurred between Glaser and Strauss in later years mainly because Glaser (1992) believed that it was not practical to adhere to some of the rigid methodological procedures of coding and developing categories that Strauss (1987) was espousing.

Grounded theory is widely used in LIS research for generating theories and is recommended by several authors such as Allan (2003), Mansourian (2006) and Ellis (1993). The distinct rules for grounded theory are as follows:

- The researcher must have no preconceived ideas while collecting and analysing data. This means that a thorough literature review is not advisable before the data collection stage.
- Analysis of the data should start as the data are being collected so that concepts can be identified during the first interview.
- The interview data are coded using a constant comparative method. Codes are grouped together to form concepts. Concepts are clustered together to form categories. Theory then emerges from the categories and concepts. Memos that contain ideas that the researcher has written down during coding also contribute to the emergence of the theory.
- Analysis can only end when saturation is achieved.

The rift between Glaser and Strauss resulted in the Glaserian and Straussian approaches to grounded theory (Mansourian 2006). Glaser believed the Straussian approach was not grounded theory anymore. For example, Glaser (1978, 1992) believed that there should be more emphasis on researchers not being prejudiced when collecting and analysing data rather that not having any preconceptions. Also, Glaser (1992) regarded Strauss and Corbin's (1990) rigid methodological procedures as forcing theory rather than allowing theory to emerge.

Grounded theory has its critics. According to arguments by Seldén (2005, p. 126-127):

- "Conceptualisations do not emerge from data. Their source is within the researcher and is dependent on the extent to which he/she is widely read in scholarly matters."
- "There are contradictions and inconsistency in [Glaser's] position … he allows unconscious pre-understandings to slip by"
- "The labor of coding in the quantity and with the meticulousness of a fanatic, recommended in particular by Strauss, tends to be a formal exercise and can turn out to be a serious threat to creativity"
- "Data do not generate theory. The researcher generates theory"

Seldén (2005) adds that without reviewing the literature prior to embarking on research, as advised in grounded theory, it is difficult to know whether the study and methodology that the researcher is about to embark upon have not been done before. Also, if a researcher were to commence a study with no preconceived ideas, then novice researchers would be better at conducting grounded theory research than those with experience (Seldén 2005). This view of Seldén (2005) has been circumvented by researchers who would tend to introduce the literature review gradually as the methodology and findings are being discussed while not allowing their focus to be blurred by the literature.

Mansourian (2006) provides a way forward for the challenges in grounded theory especially as the originators of the theory do not clearly explain how to realistically avoid preconceptions and how to know that saturation is definitely achieved and that analysis should be stopped at that point. Mansourian (2006) recommends that researchers should not adhere to the rigid step-by-step methodological procedures and view grounded theory as an approach that should fit the context of the research with the researcher justifying each step of the analysis.

Charmaz (2006) developed her version of grounded theory based on the Glaserian and Straussian approaches. Like Seldén (2005), Charmaz (2006) also disagrees with the concept of theory emerging from data and offers the argument that researchers construct theories both by their ideas and experiences and by their interactions with the subjects and their perspectives. Charmaz (2006) argues for pragmatist underpinnings to her constructivist grounded theory in that the grounded theory methods should simply be viewed as comprising flexible guidelines, rather than methodological rules, and that they can complement other qualitative methods by incorporating specific aspects of the grounded theory approach in other qualitative approaches. This is not unusual in

research. For example, Pettigrew (2000) advocated a union of aspects of grounded theory and ethnography to develop a fuller picture and better insight into subjects' experiences. Willig (2008) agrees with Charmaz's (2006) approach to grounded theory by arguing that the social constructivist version of grounded theory as advocated by Charmaz (2006) recognises the role of the researcher in that the researcher helps to construct the categories from the data rather than exclusively allowing the categories to emerge from the data and ignoring the researcher's position in the process which would be epistemologically positivistic and with questionable compatibility with qualitative methodology (Willig 2008).

Grounded theory was not considered an appropriate choice for the qualitative phase of the present study even though it is very common in LIS literature. This is because, as revealed within the research questions, the present study aims to place emphasis on understanding the experiences of actors' information behaviour through processes of description and interpretation and testing how it aligns with the integrated theoretical framework, rather than only focusing on theory generation and localised explanations to which grounded theory subscribes. The second aspect of the grounded theory approach which presents as a problem for the present study is the concept of theoretical saturation of data which is also questioned by Dey (1999). Dey (1999) prefers the term "theoretical sufficiency" (p. 117) instead of theoretical saturation on the strength of the argument that the categories that emerge in grounded theory can only realistically come into being through partial coding and cannot be saturated. With the present study's research location comprising a number of teams whose work roles are different and whose headcounts are low, theoretical saturation which, according to Glaserian and Straussian grounded theory, involves the constant comparative method and "bringing new subjects into the study until the data set is complete" (Bowen 2008, p. 140) may be difficult to achieve when a team that comprises 2 work areas has a total number of 9 staff as shown in table 4.1. Using grounded theory would make it impossible to determine at the outset the approximate number of people who will be interviewed and when the interviews would end in order to fulfil the ground rule of minimal intrusion of staff that was imposed upon the researcher at the outset. These issues with saturation are also acknowledged by Green and Thorogood (2009). The third aspect of grounded theory which presents as a problem for the present study is the grounded theory rule that requires the researcher to have no presuppositions and preconceived theories prior to data collection and analysis (Glaser and Strauss 1967). This would have been difficult, if not impossible, for the researcher to achieve when background reading was necessary for producing a research proposal and identifying a gap. In addition, the researcher had worked in the research location in the past as an information worker which, although a relevant situation to be aware of with any approach chosen, but a particular issue with grounded theory which

requires an inquirer to be careful about the ideas, knowledge and experience brought into the field. Against this background, grounded theory was not considered appropriate.

With case study, ethnography, discourse analysis and grounded theory not selected as the design of choice to inform the methodology for phase 1 of the present study, phenomenology was chosen. The rationale for choosing phenomenology is discussed in section 4.3.5.1. In qualitatively-driven mixed methods research, which the present study is, a phenomenological approach is normally used for the dominant qualitative component (Morse and Niehaus 2009).

4.3.5.1 Phenomenology

Phenomenology, as in the present study, focuses on actors' "perceptions or meanings, attitudes and beliefs, feelings and emotions, … [and] … emphasizes subjectivity (rather than objectivity), description (more than analysis), interpretation (rather than measurement) and agency (rather than structure)" (Denscombe 2007, p. 75). The present study's aim of describing, categorising and representing the experiences of information behaviour also concur with the definition of phenomenology as an "approach to the study of experience" (Smith, Flowers and Larkin 2009, p. 11). In phenomenology, a researcher can capture accounts of a complex phenomenon and the lived experiences of individuals using interviews for data collection, and then describe and interpret the subjects' feelings, behaviours and perceptions (Denscombe 2007).

Wilson (2003) explains that, to ensure that information science research is grounded in everyday practice, phenomenology offers an opportunity to create a bridge between research and practice. He adds: "In information science today, we see the impact of phenomenology in a number of tendencies, revealed most strongly on research on information behaviour" (Wilson 2003, p. 448) and cites a number of scholars who have used concepts from phenomenology in their explorations of information behaviour using interviews as the source method. Wilson (2003) argues that phenomenology is useful in understanding human action, thus supporting the choice of phenomenology in the present study. Budd (2005, p. 45) argues: "Among the ways of approaching the key questions of intellectual and practical interest to us in LIS is phenomenology" and goes on to review some LIS literature that have phenomenological flavour. Budd (2005) cites Cornelius's (1996) book as a seminal work that uses the interpretive approach to phenomenology in enhancing the practice of information science. Despite all this, LIS empirical studies that use research methods that are inspired by phenomenology and, at the same time, clearly articulate and justify the phenomenological approach and underlying philosophy are not common. For example, a search for peer-reviewed empirical studies in the Science Direct database using the search terms 'phenomenology AND information AND behavior'

in any of the journal article search fields for all years returned 2 articles that only had contributions from phenomenology. No relevant article was returned when the single term 'phenomenology' was searched for in the 'Library Literature Online' database. The outcome was equally poor as with Web of Knowledge database with no empirical study grounded in phenomenology. In the Journal of the American Society for Information Science and Technology within the Wiley Online database, the simple search term 'phenomenology' for any search field returned 47 articles with only Kracker and Pollio (2003) referring to their study as using phenomenological analysis. Kracker and Pollio's (2003) study, while evidently descriptive and Husserl (1931) inspired, did not articulate its identification with Husserl (1931) or any other Husserl-inspired phenomenologist.

However, there is much evidence of the use of phenomenology in describing and interpreting the lived experiences of subjects in healthcare disciplines. Earle 2010, McConnell-Henry, Chapman and Francis (2009), Dowling (2007), Mackey (2005), and many others have stated the popularity of phenomenological approaches in nursing research to gain insights into the experiences of care receivers and care givers in various settings.   The present study finds these non-information science research disciplines/studies equally as useful as information science studies especially as parallels from a human action conceptual perspective can be drawn between care receivers and information seekers and also care givers and information providers. In healthcare, there is a plethora of studies that thoroughly discuss the choice of phenomenological design. Those peer-reviewed conceptual papers and empirical studies in healthcare that focus on the activities, experiences and perceptions of care giving and care receiving are used in this section to supplement the dearth of similar studies in LIS. Wilson (2003) explains that, irrespective of which discipline phenomenological works are derived from, they do offer tools that promote a deeper understanding of the world of the information user. He was only able to cite very few information behaviour studies that state their phenomenological positions and referred to the works of Kuhlthau (1994) and Dervin (1992) as having "phenomenological flavour" (Wilson 2003, p. 448).

There are various phenomenological approaches. The leading approaches which provide options for consideration for use in the present study are summarised in table 4.3.

Table 4.3 Comparison of leading phenomenological approaches

	Transcendental phenomenology	Existential phenomenology	Hermeneutic phenomenology	Dialogical method	Interpretive phenomenological analysis (IPA)
Key proponent	Husserl (1913/1931)	Merleau-Ponty (1962)	Heidegger (1927/1962)	Gadamer (1975)	Smith (1996)
Stance	Positivism	Postpositivism	Interpretivism	Constructivism	Interpretivism
Goals	Epistemological	Epistemological	Ontological	Ontological	Ontological
Key characteristics	Eidetic reduction (bracketing) and intentionality. Emphasises phenomenological description and aims to find the essence of experience.	Aligned to both Husserl and Heidegger. Embraces a special eidetic reduction (our consciousness affects our perception of reality) which differs from Husserl's idealist view. Emphasises phenomenological description but believes that the essence of experience cannot be truly known.	Rejects reduction (bracketing) and intentionality. Embraces 'Daisen' (being in the world), temporality and hermeneutic circle.	Aligned to Heidegger and rejects reduction, intentionality and bracketing. Embraces being in the world and hermeneutic circle. Embraces prejudgement and biased language. Believes that dialogue between researcher and subjects promotes understanding of the phenomenon.	Aligned to Heidegger. Embraces hermeneutics and rejects bracketing. Influenced by idiography (the focus on a single individual or small purposive sample). Prefers the capturing of experiences of specific individuals rather than Husserl's essence of the experience.

"While all phenomenology is descriptive in the sense of aiming to describe rather than explain, a number of scholars and researchers distinguish between descriptive phenomenology versus interpretive phenomenology" (Finlay 2009, p. 10). Husserl (1931) is widely cited as the chief proponent of descriptive phenomenology as Heidegger (1962) is for interpretive phenomenology. Heidegger (1962) was a student of Husserl (1931) and he "emphasised his divergence" (Smith, Flowers and Larkin 2009, p. 16) from Husserl (1931). From Husserl's (1931) and Heidegger's (1962) approaches emerged a number of approaches by other phenomenologists who have aligned themselves to either Husserl (1931) or Heidegger (1962) or adopted the best parts of both Husserl (1931) and Heidegger (1962) along a descriptive–interpretive continuum. Budd (2005) explains that, while Husserl's (1931) approach can be used to describe the experiences of an information seeker, Heidegger's (1962) approach can be used to get a deeper understanding of the experiences of information behaviour and thus significantly contribute to knowledge.

Husserl (1931) used epistemological language in his transcendental phenomenology. By so doing, Husserl (1931) explained that phenomenology comprises descriptions of experiences and advocated the use of 'epoche' or, more commonly, 'bracketing' to refer to the suspension of all presuppositions, experiences, attitudes, theories and biases – that is, all subjectivity – so that eidetic reduction, a technique for getting to the essence of the phenomenon being studied, will be achieved. Descriptive phenomenology, such as Husserl's (1931) approach, requires the researcher to bracket "all past knowledge (both lay or everyday knowledge as well as expert knowledge and theories) about the phenomenon under investigation" (Willig 2008, p. 55). Therefore Husserl's (1931)

approach has similarities with positivism where the absence of the researcher's values and biases creates a distance between the researcher and the research subjects. Another key term used by Husserl (1931) is 'intentionality' to describe "the relationship between the process occurring in consciousness, and the object of attention for that process" (Smith, Flowers and Larkin 2009); that is the connection between the researcher and the world of the research subjects in order to understand the subjects' experiences.

McConnell-Henry, Chapman and Francis (2009) and Findlay (2009) argue that many researchers who use the Husserlian approach to phenomenology fail to explain clearly how they adhered to Husserl's (1931) concept of bracketing and the reader may be left puzzled as to how the researcher would prevent all prior knowledge of the phenomenon from influencing their final interpretation. Gearing (2004) refers to the use of bracketing in empirical studies as "vague and, often, superficial" (p. 1429) and lacking "uniformity and standards" (p. 1432), thus failing to recognise the whole process of bracketing which includes "philosophic bracketing, descriptive bracketing, existential bracketing, analytical bracketing, reflexive bracketing, and pragmatic bracketing" (p. 1435). McConnell-Henry, Chapman and Francis (2009) add that true bracketing and absence of prejudice can only be achieved if the researcher avoids a literature review prior to data collection and analysis. This becomes reminiscent of Glaserian and Straussian grounded theory methodology where there was disagreement in grounded theory approaches. Denscombe (2007, p. 86) adds: "It is doubtful indeed if it is ever possible to rid ourselves entirely of such presuppositions. Socialisations and the use of language make it impossible". Smith, Flowers and Larkin (2009) argue that skilful attention of presuppositions facilitates better engagement with the research subjects. LeVasseur (2003) clarified Husserl's (1931) definition of the term bracketing as:

> "*the arrival at the transcendental ego, the consciousness necessary for the apprehension of pure phenomenal experience devoid of any assumptions about personal history or location in space and time*" (LeVasseur 2003, p. 413).

LeVasseur (2003) also attempted to mitigate the accusations of idealism hurled at Husserl (1931) by attempting to re-define bracketing as being curious without interference of our natural attitude and concluding that this new definition would be acceptable to those opposed to bracketing.

As shown in Table 4.3, Merleau-Ponty's (1962) existential phenomenology is aligned to Husserlian but on the margins of Heideggerian phenomenology. Merleau-Ponty (1962) held many of the tenets of Husserl (1931) such as description, intentionality and eidetic reduction to get to the essence, or reality, of the phenomenon. He also believed, as in postpositivism, that "the essence cannot be fully known" (Racher and Robinson 2003, p. 474). Budd (2005) referred to Merleau-Ponty's approach as "conjoining of ontology and

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epistemology" (p. 51). Moran (2000) highlights Merleau-Ponty's (1962) emphasis on the dialectical relationship between the phenomenon being studied and those experiencing the phenomenon and that truth is never absolute. Where he borders Heideggerian phenomenology is when Merleau-Ponty (1962) explains that, in the search for the essence of the phenomenon, the researcher should see the essence within the context of their personal lived experiences and preconceptions.

Husserl (1931) and Merleau-Ponty (1962) do not reveal step-by-step methods for collecting and analysing data using their form of phenomenology. Ehrich (2005) states that that their phenomenology "was written at a theoretical level" (p. 3). However, scholars aligned to Husserl's (1931) descriptive phenomenology such as van Kaam (1966) and Giorgi (1985) each presented prescriptive steps for data analysis. Van Kaam (1966) presented a number of steps for analysing texts transcribed from Husserlian phenomenological interviews. They include categorising data, reducing the experiences of the subjects to descriptive terms, checking the descriptions, increasing the number of subjects to ensure that the identified descriptions remain valid for the experiences of new subjects until redundancy is achieved, and articulating a final description of the phenomenon (von Eckartsberg 1998). Giorgi's (1985) prescriptive steps for analysing data in descriptive phenomenology include capturing a general sense of what the subjects experience by reading the text, reading and re-reading the texts to determine meaning units which would make analysis manageable, transforming the meaning units into psychological terminology, and articulating the subjects' experiences by making use of the integrated descriptions from meaning units (Willig 2008, Ehrich 2005). Giorgi (2008) argues against seeking feedback from the research subjects on the researcher's descriptions of their experiences because the subjects do not possess the phenomenological skills necessary for commenting on the analysis.

The Husserlian approach and others aligned to Husserl (1931) are not used in the present study because they lean too closely towards positivism contrary to the requirements of the first research question, prohibit the use or awareness of prior knowledge and pre-understandings of the researcher, and the author of the present study agrees with Heidegger (1962) and other scholars who proffer that it is not possible to truly bracket one's experiences and knowledge when analysing texts even though some researchers using Husserlian approaches claim to achieve the state of bracketing. What is more plausible is to be able to be aware of one's experiences and knowledge so that a researcher can differentiate between the subjects' experiences and their personal values and pre-understandings.

Heidegger (1962) rejected most of the tenets of Husserl (1931) and used ontological language. Heidegger (1962) was more interested in interpretation and therefore rejected Husserl's (1931) notions of reduction and bracketing. According to McConnell-Henry, Chapman and Francis (2009), Ehrich (2005) and Spinelli (1989), Heidegger (1962) emphasised the importance of the contributions of the researcher to the research and therefore as being-in-the-world of the research subjects. To him, this meant that suspending one's presuppositions and knowledge is not compatible with discovering meaning of experiences. Heidegger (1962) used the term hermeneutic circle to refer to the circular process of interpretation and understanding of segments of texts – such as words and extracts of texts - which are then considered in terms of the complete sentence or complete text and then revised and interpreted to achieve deeper meaning, while being aware of one's preconceptions. Koch (1995) describes the concepts of pre-understanding, co-constitution and interpretation which are key to Heidegger's (1962) hermeneutic circle. She explains that, in pre-understanding, researchers bring into the world of the research subjects their preconceptions which cannot be bracketed or put aside because they are part of their understanding of the world in which they find themselves. Co-constitutionality is that state of balance between a person and the world in which they live whereby the person is constructed by the world and the person helps to construct the world using their knowledge and presuppositions. Interpretation is the use of one's background and presuppositions to create an understanding of the world.

Mackey (2005) summarises Heidegger's (1962) approach as follows:

"*Heideggerian phenomenology provides a way of approaching research which focuses on the person and the context of their existence. Heidegger's approach emphasises the rich description to be found in everyday living, and the interpretive basis of all understanding*" (Mackey 2005, p. 184)

Mackey's (2005) definition captures the spotlight on the person and their context and the fact that understanding of experiences is brought about by interpretation. These properties are compatible with the aim of the present study and set the scene for accepting Heideggerian phenomenology as the methodology of choice in the qualitative phase of the present study.

Gadamer's version of phenomenology is aligned to Heideggerian phenomenology. Gadamer (1975), while embracing the tenets of Heidegger's (1962) hermeneutic phenomenology such as the hermeneutic circle and being-in-the-world, goes further by asserting that the researcher's presuppositions and experiences (prejudgement) and the connection between the researcher and the research subjects (universality) are key to a successful phenomenological inquiry which led Fleming, Gaidys and Robb (2003) to add that the research subjects must be consulted for feedback in Gadamerian

phenomenology in order "to develop their [researchers'] understandings of the phenomenon" (Fleming, Gaidys and Robb 2003, p. 116). Gadamer (1975) believed that there isn't a distinct subjective-objective divide in his version of phenomenology and that the researcher is being-in-the-world with pre-understandings which are used to co-construct an understanding of the phenomenon. Gadamer's (1975) dialogical approach is not used in the present study because he places too much emphasis on the active use of prior knowledge to influence the findings. This has the potential to move the focus from subjects' experiences to the researcher's experiences; and the research questions in the present study do not subscribe to that.

Interpretive phenomenological analysis (IPA) is described in Smith (1996) and Smith, Flowers and Larkin (2009). IPA firmly embraces Heidegger's (1962) interpretive approach. However, IPA emphasises the experiences of individuals in their specific contexts. What makes IPA different from Heidegger's hermeneutic phenomenology is that, in IPA, the research subject "reflects on the significance of what is happening" and "the researcher is engaged in a double hermeneutic because the researcher is trying to make sense of the participant trying to make sense of what is happening to them" (Smith, Flowers and Larkin 2009, p. 3). It therefore has a deep psychological focus. Smith, Flowers and Larkin (2009) add that the method for conducting this version of phenomenology involves transcribing the outputs from semi-structured interviews, analysing the texts by identifying emergent categories and themes together with their relationships, presenting an analytic and linguistic interpretation supported by extracts from research participants' statements, and finally presenting the researcher's reflections and perceptions. The linguistic interpretation includes being cognizant of "pronoun use, pauses, laughter, … repetition, tone, degree of fluency" (Smith, Flowers and Larkin 2009, p. 88). IPA is not used in the present study because the research questions do not warrant such a deep psychological approach and the research questions and objectives do not require such a sustained focus on language style during interpretation.

Heidegger (1962) also does not reveal step-by-step methods for analysing data using their form of phenomenology (Pernecky and Jamal 2010). Van Manen (1997) and Colaizzi (1978) are widely cited examples of phenomenologists who provide non-prescriptive steps that serve as guidelines for engaging in Heideggerian phenomenological inquiry. Van Manen (1997) argues that the strength of interpretative phenomenology can vary, depending on the study, from describing the phenomenon to presenting the uncovered meanings of a phenomenon which have been governed by an external interpretive framework. However, Van Manen (1997) is aligned to Heidegger's (1962) hermeneutic phenomenology and presents a set of guidelines for phenomenological researchers to follow. Van Manen (1997) explains that the researcher

should first determine the whole experience of the research subject by reading the text several times which will serve to enhance the understanding of the phenomenon under study. He goes on to explain that the researcher should use the hermeneutic circle for reflection and for thematically analysing themes within parts of texts and within the whole text. Therefore essential statements and phrases that reveal aspects of the experience of the phenomenon are developed and integrated with similar themes, thereby developing common themes. Finally, van Manen (1997) proposes that the researcher reflects on the essential common themes using their knowledge and pre-understanding and writes about the subjects' experience of the phenomenon. The written report uses "particularly illuminating phrases from the data to capture the meaning of the themes" (Earle 2010, p. 290).

Colaizzi (1978) developed seven procedural steps for phenomenological research and gave permission for them to be modified by any researcher in ways appropriate to their research. Goulding (2005) described Colaizzi's (1978) steps as concurring with a hermeneutic endeavour and they are:

- Reading and re-reading texts
- Extracting significant statements from texts
- Deriving meaning from significant statements using creative insights
- Creating clusters of themes from meanings derived from significant statements within and across texts
- Integrating themes into an exhaustive description of the phenomenon
- Reducing the themes into a fundamental structure of the phenomenon
- Returning to research subjects to ensure that the structure of the phenomenon represents their experience (Downer and Shepherd 2010, Dowling 2007, Goulding 2005).

Colaizzi's (1978) steps are flexible and have been used both within a Husserlian phenomenological approach (e.g. Deal 2010, de Wet 2010) and a Heideggerian approach (e.g. Thornton and White 1999, Downer and Shepherd 2010). According to Finlay (2009), Colaizzi (1978) also believed that the researcher must be able to reflect on their prejudices or presuppositions and differentiate between their prior knowledge and the experiences of the research subjects.

There are many similarities between van Manen's (1997) and Colaizzi's (1978) methods and either may have a place in the present study. However, Colaizzi (1978) provides flexible procedural steps that allow for contextual modifications, remains focused on the

research participants while allowing the researcher to use prior knowledge to assist in the interpretation of the subjects' descriptions (as with van Manen 1997), but provides an opportunity to revisit the research participants at the end to validate the researcher's interpretations. Colaizzi's (1978) steps make it the partner to Heideggerian phenomenology in the present study but, nevertheless, van Manen's (1997) methods are evident in most of Colaizzi's (1978) steps.

In summary, a Heideggerian phenomenological approach informed by Colaizzi (1978) is used to understand information behaviour of an information provider in phases 1a and 1b of the present study. This is because:

- It goes beyond the mere descriptions of the subjects' experiences to providing interpretations of the experiences of the phenomenon which the research questions and objectives of the present study require.
- It ensures researcher freedom, while being-in-the-world of the research subjects, to use theoretical insights to better probe, investigate, understand and interpret the experience of the phenomenon.
- It does not advocate bracketing as coined by Husserl (1931) and allows the researcher to create an awareness of their pre-knowledge as distinct from the experiences of the research subjects so that their pre-knowledge can be used to facilitate the interpretation of the experiences of the research subjects.
- It uncovers diverse information practices of research subjects which contribute to further research and practice.
- It presents a compelling narrative of the subjects' experiences of information behaviour.
- It uses the words of the research participants to express their feelings, thoughts and perceptions as part of the experience of information behaviour.
- It validates the researcher's interpretations by re-visiting research subjects to seek feedback of the researcher's interpretations of their experiences.

(adapted from Annells 1996 and Pernecky and Jamal 2010).

A Heideggerian phenomenological approach informed by Colaizzi (1978) in phase 1 of the present study has an interpretivist philosophical stance, supports an ontological assumption of multiple viewpoints of research subjects which constitute their reality of their world (Chell 1998), and subscribes to an epistemological assumption of subjectivism where the researcher interprets the subjects' descriptions of their experiences (Saunders, Lewis and Thornhill 2009).

4.3.6 Methodology and design for phase 2

As explained in section 4.3.1, postpositivism is the philosophical lens for phase 2 of the present study. The survey strategy provides an opportunity to gather information about "a specified group of people by asking them questions" (Buckingham and Saunders 2004, p. 12). Surveys "are popular ... used for exploratory and descriptive research [and] can answer who, what, where, how much and how many questions" (Saunders, Lewis and Thornhill 2009, p. 144). Denscombe (2007) adds that survey methodology enables an appreciation of a broader view of how things are at the specific time of capture of the data from the survey participants. Survey methodology is popular in LIS literature especially when data are required to be collected from large numbers of people to aid generalisation.

An alternative to survey is experiment which, Saunders, Lewis and Thornhill (2009) explain, is appropriate for exploratory and explanatory research. Experiment is not appropriate for the present study because the research questions do not include a theoretical hypothesis that requires testing within the framework of an experiment and it would be unethical and unnecessary in the specific research location for the present study to manipulate information behaviour for the purposes of observing its outcome and perceived impact. Saunders, Lewis and Thornhill (2009) also argue that there are ethical problems involved in adopting experimental strategies in certain types of organisations.

It has been stated that the present study is a qualitatively driven mixed methods study. Therefore the quantitative component is secondary to the dominant qualitative phase. The research questions in the present study are such that they require an enhancement of the qualitative findings with another source of data and a requirement to check for influences of individual demographic characteristics on information behaviour. Survey research enables a researcher to describe a phenomenon in the population of interest and identify patterns (Buckingham and Saunders 2004) by using standardised questions. A survey provides a way forward for enhancing the answers to the research questions.

Surveys can be longitudinal or cross-sectional with cross-sectional surveys focusing on collecting data at a point in time and longitudinal surveys focusing on collecting data at different points in time using the same sample or different samples of the population (De Vaus 2001). There is no requirement to carry out a longitudinal survey of the population of information workers to determine responses over a period of time or address any potential respondent biases. This is because the ontological assumptions of the quantitative phase are based on the idea that reality is transient and not an absolute truth while the epistemological position is that, while there is an attempt to create impartiality,

the researcher is sensitive to the potential of personal biases and values and the research questions do not require time-related measurements. A cross-sectional survey would therefore be appropriate for the present study with the ontological and epistemological assumptions supporting a post-positivistic stance.

With the mixed methods approach adopted in the present study being qualitatively driven and the research questions framed in such a way that there is no requirement to determine cause-and-effect relationships, the choice of a cross sectional survey of the population of information workers provides an opportunity to determine the population characteristics as well as explore any relationships between variables which can be used for generating more questions and recommending further research in the area of information behaviour of information providers.

4.3.7 The mixed methods research

With the dominant qualitative taking an interpretivist stance and the less dominant quantitative phase taking a postpositivist stance in the present study, Greene and Caracelli (1997) argue that the combined effects of interpretivism and postpositivism are logically compatible, "strive for knowledge claims that are grounded in the lives of the participants studied and … also have some generality to other participants and other contexts, that enhance understanding of both the unusual and the typical case" (Green and Caracelli 1997, p. 13). It is the complementary strengths of these stances that support the present study's philosophical stance of pragmatism and the mixed methods research methodology.

4.4 Methods

4.4.1 The mixed methods

The framework for analysis incorporates phase 1a (qualitative as described in section 4.3.5), phase 2 (quantitative as described in section 4.3.6) and phase 1b (the respondent validation exercise which is a requirement of postpositivism, as described in section 4.7). They are shown in figure 4.4 below. Further details of the methods for each phase of the research are described in sections 4.5, 4.6 and 4.7.
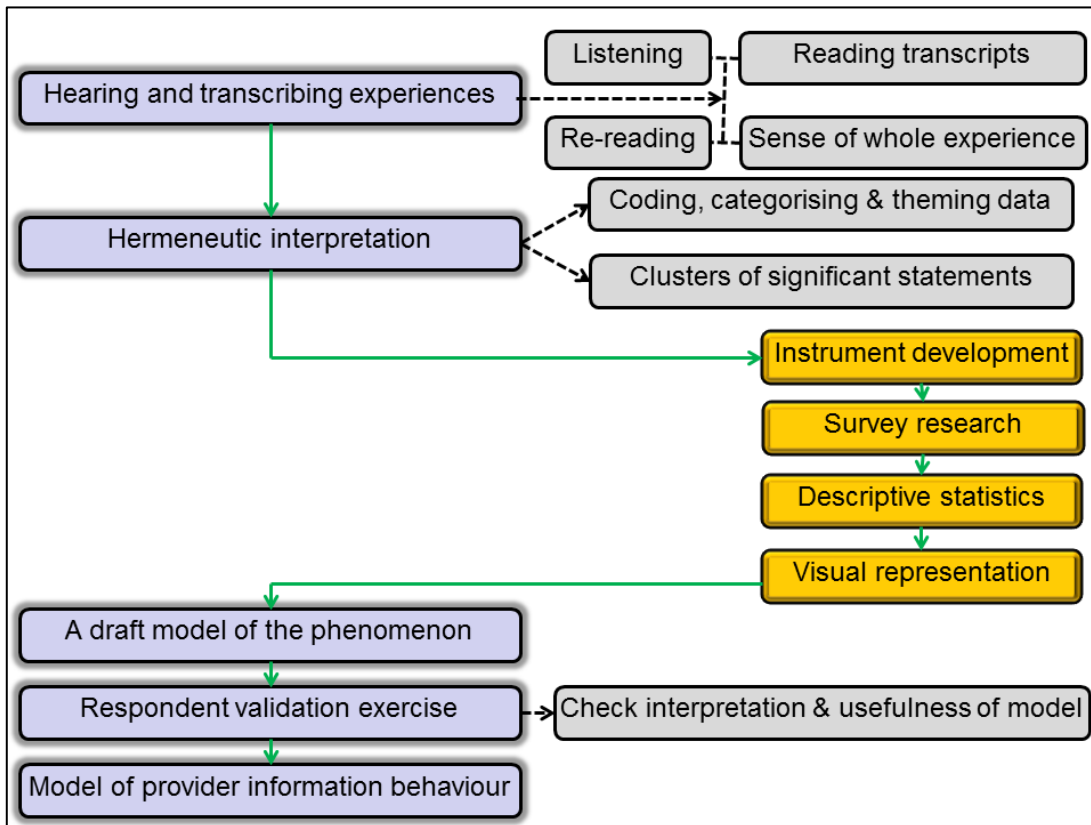
Figure 4.4 High-level framework for analysis

In figure 4.4, the summary of procedural steps taken by the author to develop a model of information behaviour and answer the research questions is shown. In phase 1a, which incorporates the Heideggerian phenomenological approach informed by Colaizzi (1978), having interviewed the subjects, the author listens to the recordings of the interviews and then proceeds to transcribe each recorded interview. After transcription, each transcript is read and re-read in order to understand the whole experience of the interviewee. Then, as part of the hermeneutic interpretation process for gathering insights into experiences of information behaviour and increasing an understanding of the phenomenon, the author initially codes the data and then uses his pre-understandings of the phenomenon and the context to continue coding and categorising the data. This is done with reference to significant statements which are considered as part of sentences and paragraphs and part of the whole text. Clusters of significant statements are identified and a structure of codes, categories and themes of information behaviour is developed. The details of phase 1a are described in section 4.5.

In phase 2, the cross-sectional survey research phase, the structure devised in phase 1a is used to develop an instrument. The instrument is used to collect data from the population of information workers. Descriptive statistics are done to describe the data,

uncover patterns, associations and trends in the data, and then the data are summarised in visual formats. The details of phase 2 are described in section 4.6.

The outputs from phases 1a and 2 are mixed to form a draft model of the phenomenon of information behaviour of an information provider which is then validated by the interview participants to form a final model of information behaviour of an information provider. This is phase 1b, the respondent validation exercise explained in section 4.7, where the findings are presented to the research respondents to seek feedback and comments, thereby enhancing the validity of the model. The outcome of the respondent validation exercise is then incorporated in the final interpretation of subjects' experiences and model of information behaviour of the information provider. Phase 1b is a necessary and important step in postpositivism and is recommended by Colaizzi (1978) in interpretivism. By the end of the phases, all the research questions should have been answered and the aim and objectives of the present study met.

Figure 4.4 therefore shows the elements of a qualitatively driven mixed methods study where a major qualitative strand, shown on the left hand side of the figure – which comprises the qualitative phenomenological study and a respondent validation exercise – is augmented by a less dominant quantitative strand shown on the right hand side of the figure and comprises a survey research phase. Morse and Niehaus (2009) support this type of mixed method design and add that the less dominant quantitative phase would normally help test a typology developed in the dominant qualitative phase and identify patterns and distribution of the qualitative findings in the population. These reasons are relevant and applicable to the present study. Creswell and Plano Clark (2007) explains that this sequential mixed methods design with one type of data being gathered at a time has a number of merits such as:

    (a) being unambiguous for describing, collecting and reporting,

    (b) being acceptable to readers with interests in either qualitative or quantitative approaches, and

    (c) laying the foundations for further phases of the study

However, the challenges of the sequential mixed methods design, according to Creswell and Plano Clark (2007), are that:

    (a) considerable time is required to plan and implement the strands of the research,

    (b) the researcher may encounter implementation and analytical issues in the quantitative phase which may not be foreseen and which may affect the arrangements for enhancing the qualitative findings with the quantitative findings, and

(c) the researcher may encounter the dilemma of deciding whether subjects in the qualitative phase should or should not participate in the quantitative phase.

4.4.2 Research quality and rigour

Teddlie and Tashakkori (2009) argue that, in mixed methods research with both qualitative and quantitative strands, the quality of such studies is dependent on the quality of each of the qualitative and quantitative strands of the mixed research. Therefore, as with the present study, different sets of standards are used for assessing the quality. The different standards are shown in the framework for research quality and rigour for the qualitative and quantitative phases of the present study in table 4.4.

Table 4.4 Framework for research quality and rigour

(Adapted from Lincoln and Guba (1985, p. 328), Trochim and Donnelly (2006), Smyth (2006), and Teddlie and Tashakkori (2009, p.296-298)).

	Qualitative Strand	**Quantitative Strand**
Truth value	**Credibility** – degree to which the researcher's findings are representative of the participants' constructions; and consistent with previous findings in the literature **Demonstrate credibility by** – identifying the phenomenological approach, member checks, prolonged engagement, discussing how research findings and the literature converge or diverge.	**Internal validity** – degree to which one can rule out alternative explanations of findings. **Demonstrate internal validity by** – making groups as equal as possible, sample not too small relative to population
Applicability	**Transferability** – degree to which findings are applicable in other contexts. **Demonstrate transferability by** – thick description of phenomenon, the context and the research setting, purposive sampling.	**External validity** – degree to which the results can be generalised. **Construct validity** – degree to which inferences about theoretical constructs can be made. **Demonstrate external validity by** – showing population characteristics and sample selection strategy. **Demonstrate construct validity by** – using conceptually distinct dimensions in the questionnaire, calculating the content validity index.
Consistency	**Dependability** – the degree to which the findings could be repeated. **Demonstrate dependability by** – using NVivo to provide an audit trail.	**Reliability** – the degree to which the results are consistent over time. **Demonstrate reliability by** – calculating Cronbach's coefficient alpha for internal consistency reliability

	Qualitative Strand	Quantitative Strand
Neutrality	**Confirmability** – The degree to which the findings are shaped by the constructions of the research subjects and not overtaken by the biases of the researcher. **Demonstrate confirmability by** – acknowledging the influences of researcher's assumptions and pre-understandings, engaging in a respondent validation exercise, and adhering to ethical principles.	**Objectivity** – The degree to which the researcher ensures adequate distance from the research subjects. **Demonstrate objectivity by** – using a self-report questionnaire, adhering to ethical principles.

As shown in table 4.4, the aspects of truth value, applicability, consistency and neutrality are the main areas that require to be evidenced for quality and rigour in any empirical study, according to Lincoln and Guba (1985). There are many criteria for evidencing quality and rigour under the four areas and those that pertain to the present study are shown in table 4.4. For the present study, credibility and internal validity are indicators of quality for the truth value aspect; transferability and external and construct validity are indicators of quality for the applicability aspect; dependability and reliability are indicators of quality for the consistency aspect; and confirmability and objectivity are indicators of quality for the neutrality aspect. As shown in table 4.4, the indicators of quality are split between the qualitative and quantitative strands and the definitions and methods of meeting the requirements of the indicators are set out within the table as recommended by Lincoln and Guba (1985), Trochim and Donnelly (2006), Smyth (2006), and Teddlie and Tashakkori (2009). Further details of how the evidence is captured for each strand of the present study are described in sections 4.5, 4.6 and 4.7.

4.4.3 Summary of the phases

Figure 4.4 and table 4.4 can be combined to form a pathway for the mixed methods design, shown in figure 4.5, which forms the basis of the subsequent sections and chapters of the present study.
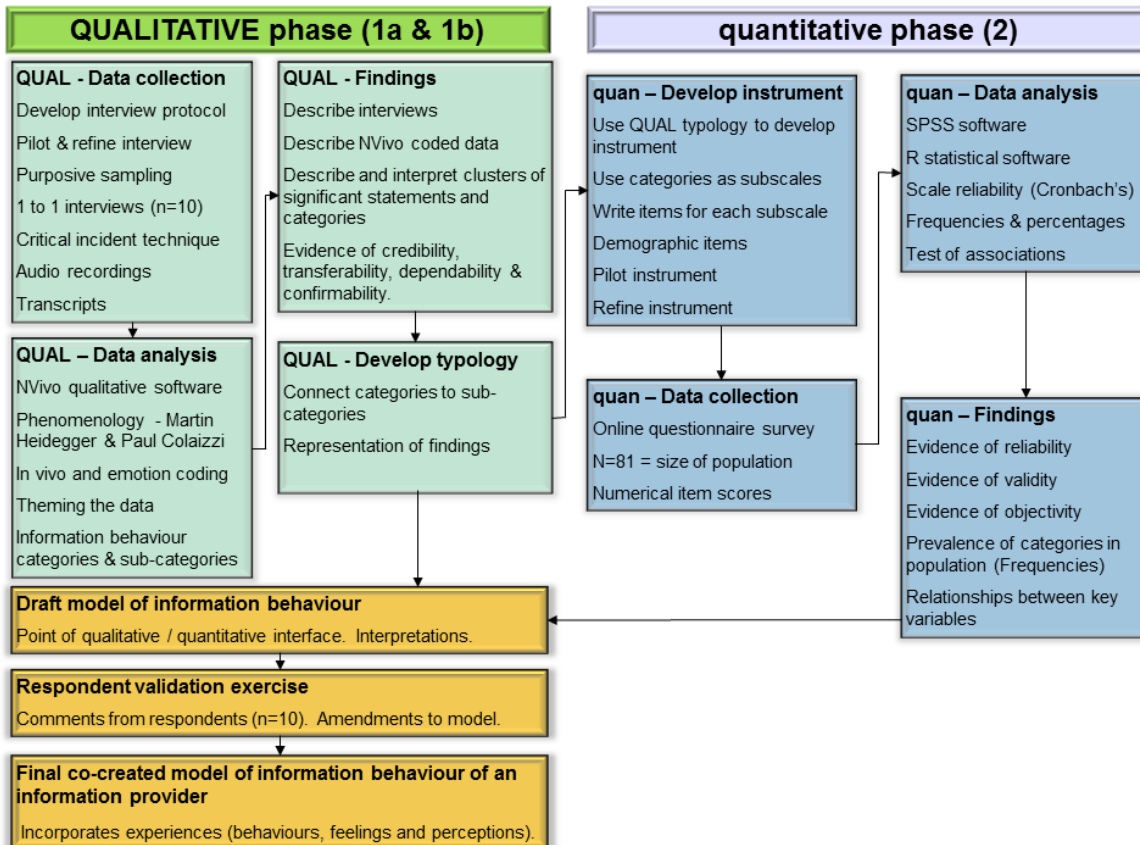
Figure 4.5 The mixed method design pathway

4.5 Qualitative phase

The subheadings in this methods section are adapted from empirical studies by authors who have stated that their Heideggerian phenomenological methods are either informed by Colaizzi (1978) or emerged from the research questions. They include Cohen (1994), Taylor (2001), Pugh (2002), Ajjawi and Higgs (2007), and Downer and Shepherd (2010).

4.5.1 Developing the interview protocol

It was decided to develop an interview protocol that was flexible and sympathetic to interpretive qualitative research – due to the choice of methodology - while attempting to address the present study's research questions 1 and 3 and satisfy research objectives 1, 2 and 5. The researcher also had foreknowledge, from having reviewed the literature, developed a conceptual framework, and having been told by the gatekeeper in the research location during the preliminary discussions that 3 major things happen to information in the research location - staff receive or access data and information, which then go through a series of processes, and then are made available to the customers. Another foreknowledge was that, as with Rose's (2006) study of information activities of rail passenger information staff, video recordings and observations were not permitted in

the study location due to the sensitive nature of the data and information the information workers interact with. Only interviews were allowed. The researcher's foreknowledge contributed to the development of an interview protocol.

While phenomenological studies encourage research subjects to talk about their experiences and perceptions, semi-structured interviews are the most widely used interview methods in phenomenological studies. According to Kvale and Brinkmann (2009), semi-structured interviews are partly inspired by phenomenology and are ways by which a researcher can uncover experiences and interpret meanings of the experiences. Many studies have justified the use of semi-structured interviews by emphasising that they bring out the best parts of structured and unstructured interviews (Ajjawi and Higgs 2007) while allowing for a great deal of flexibility, depth of questioning and rigour.

4.5.1.1 Critical incident technique

Chell (1998) recommends that the critical incident technique can be used as a tool in interpretive phenomenological inquiries and adds that the technique has an ontological base and involves the research being structured in such a way that the researcher interprets the reality of the research participants who, in turn, are co-constructors of their reality. This makes the critical incident technique highly compatible with the Colaizzi (1978) informed Heideggerian phenomenological approach used in the qualitative phase of the present study. In the present study, "the interviews are loosely structured around the critical incident technique" (Hughes, Wareham and Joshi 2010, p. 438) so that its semi-structured format interviewing facilitates the focus on value-added information behaviours.

The critical incident technique (CIT) was originally developed by Flanagan (1954) and is an excellent technique for capturing "functional or behavioural descriptions of events or problems, examining successes or failures …" (Butterfield et al 2005, p. 476) and it has been proven to be flexible and reliable (Narayanasamy and Owen 2001, Urquhart et al 2003, Narayanasamy et al 2004, Weightman and Williamson 2005 and Kraaijenbrink 2007). Cited in Edvardsson and Ross (2001), Davis (2006, p. 13) argues: "CIT has almost limitless applications to organizational problem solving". A researcher uses CIT to focus the research subject on specific events that the researcher wishes to understand, and the research subject responds by reflecting on their experiences and describing incidents that can be interpreted by the researcher. CIT is a "flexible set of principles which must be modified and adapted to meet the specific situation at hand" (Flanagan 1954, p. 335) which "encourages participants to tell their story" (Urquhart et al 2003, p. 71). In the present study, CIT is only used to devise the data collection scheme (interview protocol) and for the data collection (interview) stage. This is because the rest of the CIT

principles recommended by Flanagan (1954) regarding (a) analysing the data by subjectively formulating categories and clustering critical statements and (b) interpreting and reporting by recognising researcher biases, quoting significant statements, clarifying the researcher's interpretations, and managing ethical issues are congruent with the Colaizzi (1978) informed Heideggerian phenomenological approach in the present study. According to Chell and Pittaway (1998), CIT is flexible enough to be used in any type of research and helps the researcher and the research subjects maintain focus on the specifics of what is being studied. Some limitations in the use of CIT have been identified. The main issue is that authors have highlighted the possible problems with participants' memory recall of incidents and Urquhart et al 2003 explain that CIT researchers may struggle to cope with multiple experiences with a critical incident. Urquhart et al (2003) adds that research subjects may decide not to tell the whole truth when giving accounts of some specific past experiences. To mitigate these limitations, Sharoff (2008) suggests that researchers should believe in the ability of their research subjects to reflect on past experiences and Urquhart et al (2003) suggest that the researcher should be familiar with the research setting which would help them unravel and better interpret multiple experiences. In the present study, the author/researcher has knowledge and experience of the research location having, in the past, worked as an information worker in the study location. While this can be strength in terms of understanding the experiences of the subjects, the potential issues are personal bias and foreknowledge which, if not declared, can override the research subjects' descriptions of their experiences.

CIT has been used widely in LIS literature. Kerins, Madden and Fulton (2004) used CIT via semi-structured interviews to examine the information seeking patterns of 14 final year engineering undergraduates in one study and 12 law postgraduates in another study. Kerins, Madden and Fulton (2004) reported differences in their preference for sources of information, feelings about, and experiences of, information skills training. Sonnenwald and Pierce (2000) reported a study of the information behaviour in a military command and control setting. They used mixed qualitative methods comprising document analysis, observations and interviews. The interviews were in semi-structured format using CIT on a sample of 7 experienced military personnel. As with the present study, Sonnenwald and Pierce (2000) limited the use of CIT to critical incident interviewing. Interviews were also the focus of CIT in MacIntosh-Murray and Choo's (2005) study of clinicians' and managers' information behaviour related to patient safety. Butterfield et al (2005) examined the place of CIT in qualitative research and reviewed "74 articles, nine books, 44 dissertations and theses, three paper presentations and one report" (p. 477). They confirmed that many studies cited Flanagan (1954) for the data-collection method used

and limited Flanagan's (1954) method to only the data collection stage (Butterfield et al 2005). This is exactly what the present study has done.

4.5.1.2 The interviews questions

Kvale and Brinkmann (2009) explain that it is usually necessary to have a written guide that comprises statements about the purpose of the interview, suggested key questions and other questions for following up responses which help the interviewer when carrying out semi-structured interviews. Boyce and Neale (2006) add that an interview protocol facilitates some degree of consistency between interviews and contribute to the dependability of the qualitative research. The final version of the interview protocol, which is shown in appendix 2, emerged as a result of the pilot which is described in section 4.5.2. The interview protocol comprises 6 sections as follows:

- Introduction and aim of research
- Personal information
- Getting information or data
- Having got information, what do you do with it?
- Giving information away
- Conclusion

The introduction and aim of the research put the interview into context and serve as a supplement to the initial discussions between the researcher/interviewer and the interview subjects to invite them to participate. They also meet the requirements, as described in Flanagan (1954), for statements that outline the general aim of the critical incident interview. The introduction includes statements about ethics to ensure that the research participant feels comfortable talking about their experiences in a safe environment while ensuring "the delicate balance between the interviewer's concern for pursuing interesting knowledge and ethical respect for the integrity of the interview subject" (Kvale and Brinkmann 2009, p. 16). This is emphasised vividly in Chell (1998) who states that, before the interview concludes, the interviewee must be reassured that the interview is confidential and their anonymity is protected.

In the personal information section, there are questions that capture data described in the input strand of the conceptual model in figure 3.1; that is, questions about individual characteristics, customers and sources of information as well as the subjects' views about information. Questions do not address all the demographic characteristics in the conceptual framework because (a) they are captured in the quantitative phase of the

present study and (b) with a small subset of the population participating in the qualitative phase, the value of such data will not be high.

The third section of the interview protocol – getting information or data – covers the first set of activities in addition to outcome and impact in the conceptual framework in figure 3.1. In this section, there are 2 key questions for capturing as many incidents as possible about success and non-success/difficulty in getting information as well as the feelings that emerge as a result of the activity and the perceptions of the impact of the activities. The two main critical incident questions are constructed in such a way as to comply with the examples shown in Flanagan (1954). Kvale and Brinkmann (2009, p. 135) explain that questions can be introductory, follow-up, probing, specifying, direct, indirect, structuring and interpreting. As shown in appendix 2, following the two main questions in section 3, there are a combination of the different types of questions recommended in Kvale and Brinkmann (2009) which serve as a guide for the interviewer to ensure that aspects of the conceptual framework and research questions are captured at interview, if they do not spontaneously emerge during the research subjects' descriptions of their experiences. They include questions that should capture activities related to multitasking and collaborating, if experienced by the research subject.

The fourth section of the interview protocol - having got information/data, what do you do with it - partly arose when the gatekeeper at the research location explained that data/information go through a series of processes when once staff get them; and partly as a result of the information activities in the conceptual framework related to *transform, edit, organise, analyse, store and secure*. Like section three, the questions are influenced by Flanagan (1954), Kvale and Brinkmann (2009) and the outcome and impact strands of the conceptual framework in figure 3.1. This is also the case for section five of the interview protocol. The construction of the fifth section – giving information away – was party influenced by the statement of the gatekeeper that the third major activity is making information available to customers and partly influenced by the activity '*give'* in the conceptual framework in figure 3.1.

Section six of the interview protocol - the conclusion - brings to an end the interview and concludes with asking the participant to recommend a team member for interview if the interviewer wants to conduct further interviews. It also provides an opportunity for the interviewee to ask any questions of the interviewer about any aspect of the interview. It concludes with thanking the interviewee for taking part in the interview (Chell 1998).

4.5.1.3 Influence of Heideggerian phenomenology

In contrast to Husserlian requirements of bracketing, it is clear that the concepts of foreknowledge and pre-understandings influenced the construction of the interview protocol especially with regards to preliminary discussions between the interviewer and the gatekeepers and the knowledge obtained from the literature review and captured in the conceptual framework. The questions in the interview protocol have an ontological-existential focus on experiencing, understanding and meaning (Pernecky and Jamal 2010) and the pre-understandings of the interviewer/researcher shapes his being-in-the-world.

4.5.2 Piloting the interview protocol

Piloting is a broad term which refers to either embarking on a mini-version of a full scale research or pre-testing a specific research instrument such as an interview schedule (van Teijlingen and Hundley 2001). It is optional but advisable. However, Holloway (1997), cited in van Teijlingen and Hundley (2001), argues that piloting is unnecessary in qualitative research because the researcher learns and improves their interview skills and the content of the interview protocol as the interviews of research participants progress. For the qualitative phase of the present study, it was required to pre-test the interview protocol for the following reasons:

- to determine whether the interview protocol is robust and workable
- to gain experience of the critical incident interviewing technique
- to obtain feedback from pilot participants on interview questions and format that may be unclear and require refining
- to experience being-in-the-world in the field while having pre-understandings and fore-knowledge
- to learn lessons with regard to the interview location, duration and environment

4.5.2.1 Planning for the pilot

Three participants were purposefully recruited for the pilot. They included 2 people who used to work in the research location and had, within the previous year, moved to another work area in the wider organisation. They therefore had recent insight and experiences of information interactions in the research site. The third person worked in the research site and was selected because the person was within 4 months of leaving the organisation and therefore would not participate in the main interviews and the second phase - the quantitative survey phase - of the research. These small numbers used in piloting are consistent with the pilot methods used in empirical studies in information behaviour.

Mutshewa (2007b), for example, used one respondent for the pilot but, in addition, shared the interview schedule with two academics for comments and feedback.

The researcher had preliminary meetings with each of the three volunteers for the purposes of recruiting them and explaining the reasons for embarking on the pilot - as described in section 4.5.2 - so that informed consent would be gained. It was agreed that transcribing and coding the data were not in scope for the pilot; and that digitally recording the interviews, taking occasional notes during the interview, and reporting on the researcher's impressions of the experience were within scope. Kim (2010), who conducted a study of caregiving using Husserlian phenomenology, also used the pilot study to test an interview protocol and report her experience of Husserlian bracketing during interview. Kim (2010) found the process of bracketing her personal views and pre-understandings in order to meet the requirements of Husserlian phenomenology very difficult and, while she conceded that bracketing would never be fully achieved, she reported that only a reflexive journal for writing down one's biases and interpretations together with regular engagement with peer reviewers would help with achieving acceptable levels of bracketing. Also, with feedback from the pilot participants, Kim (2010) modified the interview questions.

A draft interview protocol was developed which would serve as a guide for the semi-structured critical incident interviewing technique. It was developed with reference to the conceptual framework, research questions and Flanagan's (1954) critical incident technique.

4.5.2.2 Implementing the pilot

It was decided that one interview would be conducted each week. The reason for spacing out the interviews was to allow the researcher to spend time listening to the audio recording of each previous interview and reflecting on the experience. The interviews took place as follows: interview 1 – early morning on week 1; interview 2 - mid morning on week 2; interview 3 - mid-afternoon on week 3. Each interview was recorded using a digital voice recorder and the interviews lasted 65, 72 and 70 minutes respectively.

The interviews were held in a quiet room free from interruptions and brief notes were recorded whenever the interview participant would talk about an activity that converged with the researcher's knowledge of information behaviour. This was evidence of the interpretive elements of Heideggerian phenomenology. Also brief notes were taken to record the experiences of the interviewer at certain stages of the interview and whenever the interviewee started describing a new incident pertaining to information behaviour. The interview participants had the freedom to elaborate on their answers and they also

responded to follow-up and probing questions to ensure that the researcher got clarification of aspects of their responses.

At the end of each interview, the participant was thanked for their cooperation and invited at the end of the 3-week period for individual feedback sessions.

4.5.2.3 Experiences and lessons learned

The pilot interviews provided an opportunity for the researcher to situate himself in the world of the interview participant by making connections between the experiences of the interview participant and theories and concepts related to information behaviour. However, the researcher had written down in the beginning of the field notes that he had to ensure that his foreknowledge and pre-understandings should not be allowed to overpower the descriptions from the stories of the interview participants. The researcher noted in his field notes that the initial general conversation with the interview participant that lasted about 5 minutes on average prior to the recorded interview commencing was useful in putting the interview participant at ease and developing a level of security and trust that was needed to encourage the interview participant to be as open as possible.

One notable experience was the position of the audio recorder which seemed to be not as effective when placed in a certain position on the table. This was noted because the position was changed for each of the 3 interviews and the recording of second interview was the clearest of the three.

The interview protocol was quite sufficient to keep the interview in progress for over an hour. There were many opportunities for probing and asking follow-up questions. The interview participants were eager to tell their story and it was clear that they viewed the experience as a period of reflection of practice for them which was useful because it brought back memories of experiences that they were in their distant memory. One of them remarked: "*I had completely forgotten about that*" and another: "*I now have lots of things to add to my performance appraisal document*".

The phenomenon of information behaviour was clearly present in their stories. The interview participants generated valuable critical incidents of achieving success or experiencing difficulties while interacting with information. The probing and follow-up questions were useful in encouraging them to reveal more low-level activities of information behaviour and this instilled a lot of confidence in the researcher that the questions were encouraging the research participants to reveal so much about their information interaction experiences. The interview participants revealed quite a lot of emotions and feelings that they had experienced while interacting with information.

Follow-up questions like "*how did that make you feel?*" were very useful in teasing out a plethora of experiences of feelings and emotions. There were times during the interviews when the researcher experienced empathy as a result of the revelation of these feelings and emotions because the researcher also had experience of working in the same research location as the interview participants. This was evidence of being-in-the-world of the interview participants which a key concept in Heideggerian phenomenology.

On listening to the recorded interviews, there was evidence of a few occasions when the researcher failed to follow some responses with probing questions in order to unlock the hidden meaning of experiences of the interview participant. For example, the researcher asked: "*So you say you were happy with their cooperation. What do you think would be the long term effect of this?*" and the interview participant responded by talking about the effects being the development of an information-sharing culture. However the researcher failed to follow up on probing the interview participant about the nature of the cooperation which should have provided insights on the meaning of cooperation. Lessons were learned from this to ensure that opportunities for probing in order to fully understand and interpret a response are not missed.

Another shortcoming that emerged a few of times in the audio recording was the researcher not waiting for the research participant to absolutely finish their sentence before speaking. This resulted in a few instances when it was difficult to make out the last couple of words of the interview participant due to the overlap in speaking. However, while the researcher felt at the time that this situation was sometimes necessary to make the interview participant return to the subject following a period of digression, the lesson learned was that it would have an adverse effect on transcribing the endings of some sentences and so it was important to allow sentences from interview participant to end properly if possible.

The feedback from the interview participants was very useful. They indicated that mid-morning was the best time for interviewing. They also requested that the introductory material in the interview protocol should include general statements about what the main questions that they will be asked. This subsequently resulted in the researcher enhancing the paragraph in the interview protocol about the aim of the interview to include details of each key question.

The interview participants also requested that, while they understood all the questions, the main critical incident questions were rather long and that they could be broken down. In response, the researcher made the necessary amendments and the final interview

protocol is shown in appendix 2. An example of a change to the main question in section 3 of the interview protocol is as follows:

Question in interview protocol used in pilot

"Tell me about a time when, in response to a need for information, you successfully found, accessed or captured information/data to satisfy the need; and then tell me what you feel the effect of the outcome would have been on you and/or your colleagues".

Amended question following pilot feedback

"Think of a time when, in response to a need for information, you found, accessed or captured information or raw data with success to satisfy the need. What activities did you engage in?"

In the amended question shown above, it was decided to remove the feelings and impact question from the main question and use only the follow-up and probing questions to capture experiences of feelings and opinions about perceived impact of information behaviour. This was a plausible approach because the interview participants did talk about their feelings that emerged as a result of their information activities without prompting most of the time and it was nevertheless easy to include the follow-up questions "*How did that make you feel?*" and "*What do you feel the more long term effects ... would be?*".

One small but very important feedback from an interview participant was that the researcher should have offered them a glass of water because talking for over an hour made the interview participant thirsty but they felt they could not interrupt the interview to find some water. This was duly noted as a lesson learned for the main interviews.

Amendments were made to the interview protocol and, with the researcher having conducted a pre-test of the interview protocol to satisfy himself that critical incident interviewing with a Heideggerian phenomenological base can provide insights into the phenomenon of information behaviour that start to answer the research questions in the present study, it was therefore time to embark on the full-scale interviews with confidence.

4.5.3 Selecting research participants

Purposive sampling is ideal for research studies where it is necessary to obtain insights into a phenomenon (Onwuegbuzie and Leech 2007) and therefore ensure that the sample comprises information rich (Patton 1990) research subjects who have experienced the phenomenon (Moustakas 1994). Against this background, it was decided that purposive sampling methods will be used for the qualitative phase of the present study.

In phenomenology, sample size is usually very small compared to a theory building methodology such as grounded theory where the emphasis is on data saturation. Cohen (1994) add that, in phenomenology, "sample sizes are small and purposeful because the purpose of the research [is] to obtain subjective depth in the data, not objective or quantifiable data" (p. 38). Flanagan (1954), in discussing sample size for use in the critical incident technique argued that sample size is not important; but rather the number of critical incidents is what is important. However, with critical incident technique limited to the design of the interview protocol in the qualitative phase of the present study which is driven by Heideggerian phenomenology informed by Colaizzi's (1978), it is also necessary to highlight sample size recommendations from qualitative scholars. Creswell (1998) recommends that interview sample size in phenomenological research should comprise between 1 and 10 subjects. Morse (1994) recommends at least 6 interviews, and Starks and Trinidad (2007) recommend typical numbers of between 1 and 10 people because, in phenomenology, "only a few individuals who have experienced the phenomenon – and who can provide a detailed account of their experience – might suffice to uncover its core elements" (Starks and Trinidad 2007, p. 1375). A selection of studies that have used Heideggerian phenomenology informed by Colaizzi (1978) have typically recruited the following sample sizes for interview: Cohen (1994) – 8 subjects who have read specific types of literature, Taylor (2001) – 8 cancer patients, Pugh (2002) – 6 flight nurses, and Downer and Shepherd (2010) – 8 district nurses.

In the present study, there are 9 work teams in the research location and it was decided to invite all the team leaders on the assumption that they were the most knowledgeable information worker in their team due to their level of seniority and their breadth of experience. However, two of the team leaders felt they were relatively new to the post and they each recommended one person within their team to take their place. All of the 9 information workers approached consented to participate in the interviews. During one of the interviews, one of those who had deputised for a team leader suggested that the researcher interviews an additional team member who had valuable knowledge and experience that would be beneficial to the research. This was a form of snowball sampling. The recommended individual was approached and consented to participate. Therefore the total number of people interviewed was 10. The breakdown of teams of information workers has already been presented in table 4.1 (section 4.2.2).

Individual meetings were arranged between each of the 10 participants and the researcher to discuss the purpose of the research and seek informed consent. The ethics underpinning the present study is discussed in section 4.8. Informed consent (see appendix 3) was obtained from all of the participants, some during the preliminary meetings and others via email as shown in an example in appendix 4. Email is the choice

of regular communication within the research location and it was important to recognise and respect this medium of communication. Therefore many of the interactions between the researcher and the research participants pertaining to consent took place via email. This method of communication is supported by Miller and Boulton (2007) who capture this electronic medium of communication and its implications for research as follows:

> "Changes in communication technologies, for example email, can offer researchers new opportunities to document the process of consent – the invitation, the response from the participant, the questions asked and the answers given, the negotiation of dates and times of interviews and so on. This is potentially a much more appropriate and useful way of working towards (and documenting) participation in research which is both informed and voluntary than asking participants to sign a consent form at the start of a study" (Miller and Boulton 2007, p. 2209).

4.5.4 Interviewing research participants

4.5.4.1 The invitation

Electronic calendar meeting requests for interviews were sent to each of the initial nine volunteers and the interviews took place over six weeks. The arrangements were the same for the tenth volunteer who was a product of snowball sampling. The meetings were easy to arrange in this way because all the volunteer research subjects and the researcher worked for the same parent organisation. The meetings mostly took place around 10.30am and there were either one or two interview sessions booked for each of the six weeks. Three of the interviews had to be rescheduled because the participants had other pressing engagements. The plan was to interview each participant only once so that there would be minimal intrusion.

4.5.4.2 The environment

The surroundings of the meeting room were uncluttered and comfortable with available drinking water. The researcher made sure the meeting was relaxed within a trusting and safe environment. To achieve this, the researcher engaged the interview participant in brief general conversation about his research and the benefits for the interview participant before the recording commenced. What emerged from the interview participants was that they were looking forward to participating in the interviews (a) to provide as much help as possible to a study which they believed would be beneficial in terms of highlighting experiences of engaging in a range of information activities that would be useful to all staff and managers for enhancing the quality of their work, (b) to learn from their accounts of their experiences in order to improve their practice and (c) to reflect on their practice and remind themselves of the work they have been doing that would be beneficial for inputting

into their electronic knowledge and skills framework (KSF) document for their appraisal meetings with their line managers. The KSF is a national tool used by the majority of workers in the UK National Health Service and has 30 dimensions, examples being information processing, information collection and analysis, knowledge and information resources, communication, personal and people development, service improvement, and quality. Six of the dimensions are core and the employees are assigned a selection of the others depending on their job function. The employee has to provide personal evidence of activities they have experienced for each of their dimensions at a level appropriate to their salary band and work role. This feeds into their annual appraisal meetings with their line manager and describes the knowledge and skills that the staff member has evidenced in order deliver high quality services (NHS Scotland Pay Modernisation 2004).

The portable digital voice recorder was switched on as soon as the interviews commenced which ranged from just over 60 minutes to just under 90 minutes. There were no interruptions for the duration of each interview.

4.5.4.3 Capturing the experience

The semi-structured format of critical incident interviewing enables the research participant to maintain the freedom to use their own words to describe their experiences in whatever way they feel comfortable while allowing the researcher to maintain focus on the phenomenon of information behaviour in order to answer the research questions. Walker (2011) explains that the semi-structured format does "offer a balance between flexibility and control" (Walker 2011, p. 21). The interview protocol, shown in appendix 2, facilitated the occurrence of this 'balance'. For example, section 2 of the protocol comprises a mixture of open and closed questions in order to capture brief demographic details about the interview participant related to their area of work, customers and sources of information as well as their understanding of the term information. These questions were necessary to get a snapshot of the individual in context and to determine whether their understanding of 'information' which underpins the entire study has some degree of convergence with the researcher's pre-understanding of information. This was interviewing with hermeneutics (that is, Heideggerian interpretive phenomenology) in action whereby the researcher is open to what is in the world of the interview participant by 'being-in-the-world' of the interview participant with pre-understandings and background information of the phenomenon which will help the researcher understand and interpret the realities of the interview participant. Pre-understanding and interpretation are inextricably linked (Heidegger 1962). The researcher's pre-understandings comprised personal experience and understanding of the research location, details of an extensive literature review and a conceptual framework.

In sections 3, 4 and 5 of the interview protocol, interview participants are asked to give an account of particular experiences of information behaviour and perceptions of outcome and impact related to getting information, giving information and what happens in between getting and giving. These gatekeeper-inspired and literature-driven information activities are also evidence of the influence of pre-understandings and foreknowledge influencing the critical incident interviewing technique. The critical incident style of interviewing is documented as an advantage in recounting experiences and perceptions in that "incidents are covered in detail, a respondent can be prompted to reveal how they felt about situations and can discuss what the incidents meant to them as an individual" (Chell and Pittaway 1998, p. 26).

The semi-structured questions in the interview protocol were devised in such a way that, as the interview progressed, the interview participant would recognise that the flow of data and information within the organisation was such that they could map their information activities with each stage of the flow, thus adding value to the information for the benefit of the customer.

The research participants were encouraged, during interview, to reveal as many incidents as possible. Experiences related to collaborative activities easily emerged during the interviews but those related to multitasking required the use of the bank of extra questions as detailed in the interview schedule in order to tease out such experiences. During post-interview chats after the interview had formally ended, some of the research participants expressed amazement at the level of multitasking they did because they said they took multitasking activities for granted and engaged in such activities automatically without first thinking about it.

Some of the interview participants required minimal probing because they would just talk without any prompting. Some required to be brought back into focusing on the phenomenon because they would digress to other unrelated phenomena. Yet still others required much prompting and probing because their responses would be rather brief even though, following probing, they had many relevant and valuable experiences to reveal. The researcher captured some of these experiences in his personal field notes. It is therefore impossible to find the ideal interview participant because, while some may be motivated, cooperative, consistent and knowledgeable, others wander off the topic, contradict themselves, and provide very brief answers to open questions (Kvale and Brinkmann 2009). In the present study, to maximise the value of each interview, the researcher took cognizance of the advice of Kvale and Brinkmann (2009) by employing the following interview techniques in the present study with actual examples of the researcher's utterances during interview:

- Engaging in pre-interview chats to secure a well-motivated interview participant, e.g. "*have you ever been a research interview participant?*"

- Validating their accounts by re-stating what they had just said as a means of confirming, e.g. "*So you were very frustrated*"

- Being empathetic to the accounts of the interview participants particularly when they would talk about their feelings and emotions as outcome of information behaviour e.g. "*Gosh, I can see why you were happy – that must have been quite an achievement*"

- Using non-verbal techniques such as nodding and verbal techniques such as the use of the words 'yes' and 'okay' to be-in-the-world of the interview participant and thus show interest in, and understanding of, their descriptions e.g. "*Right…I see (while nodding)*"

- Using probing questions when the response is too brief thus rendering an understanding of the experience impossible e.g. "*Tell me more about storing the data. Why did you have to store it? Who had access to it?*" and "*Why did she do that?*"

- Clarifying interview participants' responses to ensure understanding e.g. "*So let me just get this clear in my mind – although you wrote the content in the PowerPoint presentation, the two of you presented it*"

- Steering the interview participant back to focussing on the phenomenon of interest e.g. "*So back to what you were saying about arranging meetings to discuss the issues…*"

- Using direct closed questions to ascertain facts for aiding understanding e.g. "*Did you ask him to contribute to writing up the final report?*"

- Using the follow-up questions in the interview protocol to seek understanding of variables of interest that have not been mentioned in interview participants' responses e.g. "*Were you doing more than one task at the same time? How?*"

4.5.4.4 Concluding the interview

Section 6 of the interview protocol in appendix 2 indicates that the conclusion of the interview involved the opportunity for the interview participant to nominate one more person who they felt may be useful in providing additional information if the researcher, upon analysing the transcripts, felt that another person needed to be interviewed. This question proved to be useful when one of the interview participants insisted that the researcher interview another information worker who had a different workload that would be beneficial to the research. The other question in section 6 invited questions from the interview participant where some of them opted to make general comments about the good experience they had in reflecting on their practice and others offered themselves as

available at any time if the researcher required clarification on any matter captured in the interview.   At the end of the recorded interview, the participant was thanked for agreeing to take part.

4.5.5 Getting a feel for the interviews

All the interviews (ranging from 1 hr 10 mins to 1 hr 30 mins) were transcribed by the researcher to 200 pages (88000 words) of text so as to be immersed in the experiences of the interview participants. With the present study being interpretive phenomenological research rather than descriptive phenomenological research, it was decided not to return the transcripts to each interview participant for corrections. The plan was to wait until the accounts have been interpreted by the researcher before returning to the participants for feedback.   It was indeed clear that the transcribed interview oftentimes looked like convoluted speech with sentence construction errors but nevertheless conveying rich useful messages that illuminate the experience of information behaviour and the perceptions of the effects of the phenomenon. Kvale and Brinkmann (2009) agree that "oral language transcribed verbatim may appear as incoherent and confused speech, even as indicating a lower level of intellectual functioning" (p. 187) and may thus result in research participants experiencing "shock" (p. 187) upon reading transcripts of their interviews.   They add that returning verbatim transcripts to research participants may result in "unethical stigmatization of specific persons or groups of people" (Kvale and Brinkmann 2009, p. 187). Dearney (2005) wrote an article to reflect on her experiences of conducting semi-structured interviews. She interviewed 18 participants and followed the advice of authors who state that it is good practice to return the transcripts to participants for checking. While Dearney (2005) felt that the transcripts were an accurate reflection of the interviews, a number of the participants did not see it that way. The participants used terms such as horrified, embarrassed, feeling foolish, and worried to describe their feelings after having read the transcripts and, despite attempts at reassuring them that the way people speak differs from the way they write, one participant initially refused to cooperate with a follow-up interview and Dearney (2005) was left grappling with ethical issues such as her role in not preparing participants adequately prior to returning transcriptions to them. Dearney (2005) concluded that she would not, in future empirical work, return verbatim scripts to research participants but instead, either return her own interpretations of their experiences or translate the texts into acceptable format. This is in agreement with the approach in the present study which included a respondent validation exercise when once interpretation had taken place. In addition to the formal validation exercise, there were regular interactions between interview participants and the researcher following the period between end of interview and respondent validation exercise which included updating them on progress of the analysis and listening to any feedback they wished to offer. The participants were all very positive and supportive of

the emerging analysis and this must have left them with feelings of being co-constructors of the interpretations.

The transcripts were read by the researcher several times to ensure that the researcher was immersed in the subjects' experiences. The digital audio recordings of the interviews were listened to several times in order to use the voices of the subjects to supplement an appreciation of the subjects' real-life experiences and perceptions of information behaviour. The transcripts were then read slowly, line by line to gain a preliminary interpretation of the experiences of the subjects so as to facilitate the coding of the transcripts. Any segment of text that could potentially identify the subject or other individuals was redacted. This was particularly important because the manner of interview conversation was such that, because the interview participants were known to the researcher, when describing their experiences, they would use acronyms and refer to individuals by name that they knew were all familiar to the researcher.

4.5.6 Interpreting the data

In hermeneutic interpretation of texts, there are a number of canons of interpretation proposed by Kvale and Brinkmann (2009) which can be summarised as follows:

- Back and forth circular process involving reading whole transcripts, interpreting parts of the transcripts, relating the parts of the transcripts to the whole of the transcripts, while allowing researcher's pre-understandings to enter into the interpretation
- Comparing the part-interpretations with the global meanings that emerge from the whole transcripts and comparing these interpretations with other transcripts
- Formulating themes with the interpretations of segments of texts
- Using innovation and creativity to enrich the understandings and meanings of the experiences of the interview participants

The transcripts of the interviews were exported into NVivo qualitative data analysis software (QSR International 2011) in order to make meaning from the experiences of the interview participants and thereby provide interpretations that comply with the Heideggerian hermeneutic tradition. According to Bazeley (2007), NVivo facilitates the management and organisation of ideas and data, the reporting from the interview data, and the modelling of the emerging themes from the data. Smyth (2006) adds that there is congruence between interpretivism and managing data using NVivo because NVivo allows scope for thinking about the research and provides the means "to record, code, search, condense and link ideas and data" (Smyth 2006, p. 136), thus making meaning and enhancing the trustworthiness of the research.

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However, many other qualitative data software analysis tools exist that are equally as robust as NVivo. Examples are MAXQDA (Maxqda 2011), Coding Analysis Toolkit (CAT 2010), and ATLAS.ti (ATLAS.ti 2011). NVivo was chosen because it could deliver the level of analysis required of the present study, it was the software of choice of the researcher's PhD course provider, Robert Gordon University, and there were readily available and free online webinars for accessing support. However, while the data management advantages proved useful in the present study, there were challenges with data overload and the time required to make sense of the huge numbers of initial codes.

The approach to categorising and developing themes from codes was compliant with the recommendations in Saldaňa (2009) for coding in phenomenological research. A simplified form of the coding process for making meaning from the transcripts is adapted from Saldaňa (2009) and shown in figure 4.6 below.
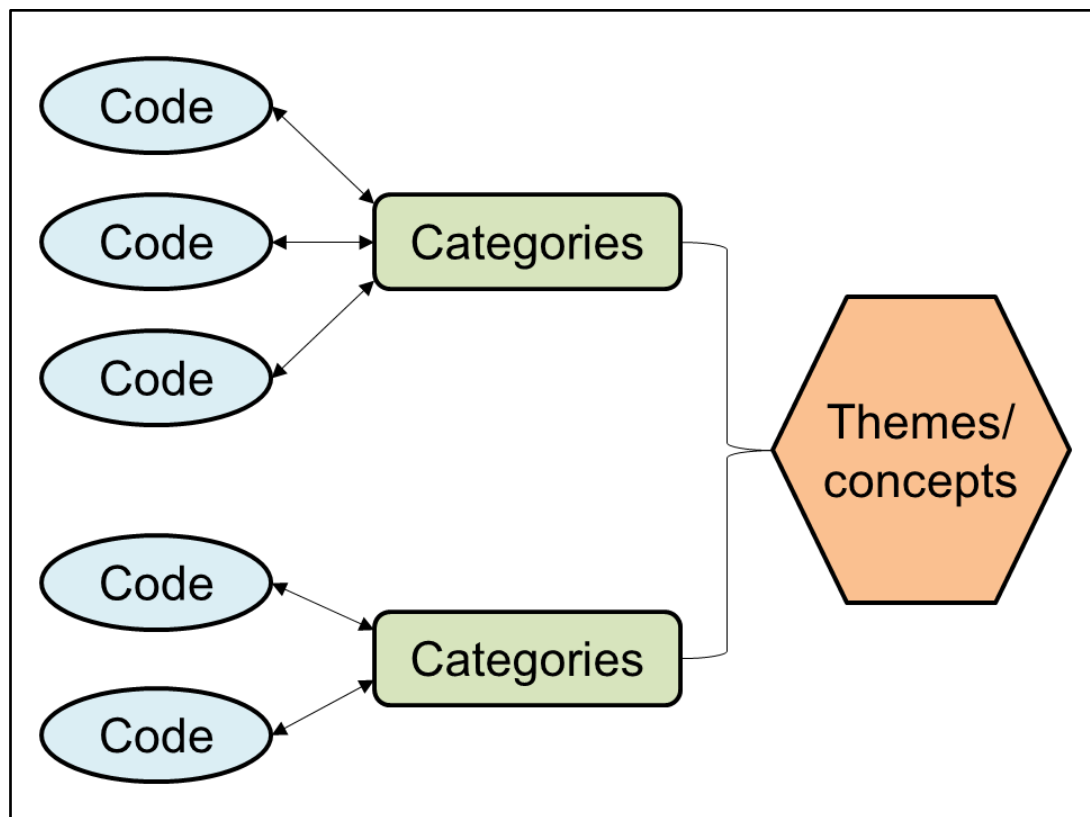
Figure 4.6 A simplified code-to-theme pathway

(Adapted from Saldaňa 2009, p. 12)

In figure 4.6, the pathway shows that transcripts are first coded and categorised. Then there is a back-and-forth movement between coding and categorising (depicted by lines with arrows on either end) in the form of a Hermeneutic circle whereby the initial codes, or

first order constructs, are revisited and re-categorised within and between parts and whole transcripts taking into account the researcher's pre-understandings which included the preliminary discussions with the gatekeepers, the literature and the researcher's knowledge of the research location. Second-order constructs or categories as a result of re-coding are thus formed. Having determined the categories, they are then themed. Following theming, the themes and categories are re-visited and refined, again informed by the hermeneutic circle, before finalising a set of themes which are ready to be combined with the outcome of the quantitative phase of the research. The whole hermeneutic process took several months because it was necessary to revisit each initial code and the decision processes involved in transforming them to final codes and categories to make sure there was a high degree of confidence in the judgements made in coding and theming. Saldaňa (2009) proffers coding methods for use in the analysis of texts based on interpretive phenomenology that are applicable to the present study. They are In Vivo coding, emotion coding and theming the data.

4.5.6.1 In Vivo coding

In Vivo coding is a form of coding that represents a word or phrase from the language of the interview participant. It is coding for identifying first order constructs which represent the actual words of the interview participants present in the transcripts. In Vivo coding serves as the beginning of the generation of statements and words that are significant to the interview participant (Saldaňa 2009). However, it is unwise for In Vivo coding to be the only coding strategy in interpretive phenomenology because the influences of the researcher's pre-suppositions during In Vivo coding are negligible.

The following example in Table 4.5 shows how In Vivo coding was used in two different segments of texts in the present study. The first transcript extract is Person A's response to being asked a specific question about the type of customers they engage with. The second transcript extract is Person B's response to being asked a probing question about how they cope with accomplishing the many tasks they have just described.

Table 4.5 Extracts of interview transcripts with In Vivo coding

Extract of text	In Vivo coding
Extract 1 by Person A "Taking this area as a whole it would include care providers; that's the different clinical disciplines, medics versus allied health professionals; also service managers at a local level; service planners at a	 "care providers" "medics" "allied health professionals" "service managers" "service planners"

Extract of text	In Vivo coding
regional and national level; national policy people, and some of the of royal colleges. They're interested in various things including the [redacted] statistics which we will be publishing tomorrow for example. Then there is the main ones that span from people within the geographical health boards to national agencies to the general public and we could also work with patient groups and also informal carers and voluntary agencies although we haven't had quite so much dealings with patient groups of late".	"policy people" "royal colleges" "publish statistics" "people within health boards" "national agencies" "general public" "patient groups" "informal carers" "voluntary agencies"
<u>Extract 2 by Person B</u> I tend to be multitasking most of the time anyway. I mean, if I'm looking for something I'll spend the time until I find the information and then I'll keep that information up on the screen and sometimes I look at another window just to make sure I've got all the information I've got available and then phone the person or compose an email and then come back to what I was looking at. It's quite worrying I've not thought about it. Because I'll have a Spreadsheet open because I'll be adding the new information or a new product thing, so that'll be open so I can just cut and paste the information. Cos if it's right you don't have to type it and make mistakes. So I could be filling out the spreadsheet, and be on the net to find the information and do the email to the person or phoning the person I want to speak to. It's worrying because sometimes you don't even think about it. You're more technically able nowadays, or people are more technically able to use the	"Multitasking" "looking for something" "spend time until I find" "keep information on screen" "look at another window" "make sure I've got all the information" "telephone the person" "compose an email" "come back to what I was looking at" "spreadsheet open" "adding new information" "cut and paste" "filling out spreadsheet" "find information on the net" "email the person" "telephone" "don't even think about it"

Extract of text	In Vivo coding
technological products to make sure you're doing things more efficiently.	"using technological products"

In Table 4.5 above, during In Vivo coding of Extract 1 by Person A, the In Vivo codes become useful for using in the rest of the text and across texts as common codes start to emerge from the data. Also, it becomes possible to start clustering the codes together. For example, "medics" and "allied health professionals" can be clustered under "care providers"   For the In Vivo coding of Extract 2 by Person B, common codes start to emerge, such as "telephoning", "emailing", "cut/paste/adding". Also person B mentions the word "Multitasking" which is a common terminology in LIS literature. After the first order constructs were captured from In Vivo coding, then the next stage was to determine the second order constructs which are "generated using the researchers theoretical and personal knowledge ... [and are] abstractions of the first order constructs" (Ajjawi and Higgs 2007, p. 624).   One typical example of generation of second order construct is when, in Extract 2 by Person B, there is mention of "multitasking". Following this, Person B talks about "keep information on screen", "look at another window", "telephone the person", "compose an email" and "come back to what I was looking at" which, according to LIS theory which the researcher is familiar with, comprise the components of sequential multitasking in which activities are interrupted with other activities before the resumption of the previous activities. While engaging in interpretation to arrive at second order constructs, field notes may be consulted to determine the context of the conversation which may not have been captured at interview. The field note extract that accompanied this section of the transcript was "subject surprised at level of multitasking" and "finally got him talking" and these helped remind the researcher why the interview participant was saying so much about the details of multitasking.

NVivo software facilitated the process of In Vivo coding, revising the codes and clustering the codes. NVivo version 8 makes use of several nodes to facilitate coding and theming. The most commonly used are free nodes (which are stand-alone and not associated with other nodes in a structured format) and tree nodes (which are organised in a hierarchical structure that comprises child and parent nodes). Most of the texts were initially coded using free nodes and, as the second order codes and clusters of codes that formed categories were emerging, they were then moved to become tree codes because a hierarchical structure was emerging. Use was made of coding stripes of different colours in NVivo to help the researcher differentiate between the different types of nodes and codes within the text so that, at a glance, the researcher can see the density and types of coding within the texts to facilitate re-coding.

Table 4.6 shows examples of short extracts from the transcripts that have been coded In Vivo and then revisited and recoded interpretively with the researcher's knowledge and understanding of the research context, research location and LIS literature.   In this example, it was clear that all the constructs that emerged from In Vivo coding showed in Table 4.6 could be categorised as "Healthcare providers".

Table 4.6 Re-coding of In Vivo codes

Extract of transcript	In Vivo code (1st order)	Re-coding (2nd order)
"all the NHS Boards in Scotland including the special health boards"	"NHS Boards"	Healthcare providers
"I deal with Scottish National Blood Transfusion Service as if they would be any other Board"	"Scottish National Blood Transfusion Service"	Healthcare providers
"it would include care providers, that's the different "clinical disciplines, medics versus allied health professionals"	"Care providers"	Healthcare providers
"also service managers at local level and service managers at regional and national levels"	"Service managers"	Healthcare providers
"geographical health Boards"	"Health Boards"	Healthcare providers
"NHS Boards"	"NHS Boards"	Healthcare providers
"Hospital staff"	Hospital staff"	Healthcare providers
"Health Boards"	"Health Boards"	Healthcare providers
"Community health partnerships"	"Community health partnerships"	Healthcare providers
"A clinician could use it on the patient report, their managers could use it to get secondary information for planning, etc."	"Clinicians" "Clinician managers"	Healthcare providers

Extract of transcript	In Vivo code (1st order)	Re-coding (2nd order)
"Scottish patient safety programme"	"Scottish patient safety programme"	Healthcare providers
"Allied health professionals, that's physiotherapists, speech and language therapists and all these sort of professionals allied to medicine"	"Allied health professionals"	Healthcare providers
"At the moment I am working with nurses in the community and their managers and their leaders as well"	"Nurses", "Nurse managers", "Nurse leaders"	Healthcare providers
"Well we've various contacts as I said in the 14 health boards"	"Health boards"	Healthcare providers
"people working in the NHS, in the hospitals, the trusts"	"People working in hospitals"	Healthcare providers

4.5.6.2 Emotion coding

Emotion coding is recommended in interpretative phenomenology particularly when feelings and emotions within the texts are required to be captured. "Emotion codes label the emotions recalled and/or experienced by the participant, or inferred by the researcher about the participant" (Saldaňa 2009, p. 86). In the present study, it was done alongside In Vivo coding

Table 4.7 shows how extracts from two different texts are coded for emotions within NVivo. As best as possible, the initial emotion codes are the language of the interview participant but some level of interpretation is occurring simultaneously. For example, In Extract 4 by person D, the following statement "… *you think, "Right, if I can't find it in this way can I add in something, I'll come at it from another direction."*…" is interpreted and coded as "feeling determined" because the question was about feelings and the researcher was aware that the feeling determined exists as a construct in the literature and, in the opinion of the researcher, represents what the interview participant was trying to articulate.

Table 4.7 Emotion coding examples

Extract of text	Emotion coding
Extract 3 by Person C Once we were finished, and once I'd got the finished document ready to go, it was very satisfying. Relief. Relief. It's great. When a request comes in for something like that, and you're able to go away and source the information that people want from various databases, and easily use it and provide it in a format they require, or easily link them to it, it's pleasing, but it's partly relief because it's an complex process.	""satisfying" "Relief" "pleasing" "relief"
Extract 4 by Person D It's satisfying when you get it. It's frustrating when you don't. But then it's that challenge thing and you think, "Well, if I haven't found it I need to think of something else"; and then it's having that thought, you think, "Right, if I can't find it in this way can I add in something, I'll come at it from another direction." And that's quite satisfying, I think, actually finding out the information is like a quiz, if you get the right answer it's very, very satisfying. I mean, people do ask me for things and I will find them because I seem to have maybe a thought process that I can look at things in an effective way. That's a good feeling.	"satisfying" "frustrating" "determined" "satisfying" "satisfying" "good"

Also, in table 4.7, the recurring emotions start to emerge. For example, the code "satisfying" starts to occur frequently within and between texts. The field notes that accompanied both Extracts 3 and 4 were "*Lots of positive feelings. Smiling while talking*". This was an indication to the researcher during interpretation that the interview

participants had genuinely experienced positivity from the work they did and therefore did not display any dissonance between what was being said and how they were feeling.

4.5.6.3 Theming the data

The outcome of developing first and second order constructs was that themes were emerging both from the data and from the researcher's interpretations. In interpretive phenomenology, themes are conceptual topics discovered by the researcher as an outcome of coding, categorising and pre-understandings and therefore give meaning to the experience of the research subjects within unified high-level constructs (Saldaňa 2009). There is usually a comparison between the theme and its equivalent, if any, in the literature.

An example of theming the data is shown in Figure 4.7. It has similarities to axial coding (used mostly in grounded theory) in that it is possible to appreciate the value of hierarchical codes, categories and relationships. The themes are re-examined and it may be necessary to review the categories and codes by re-visiting the text and making use of the researcher's prior knowledge and understanding.
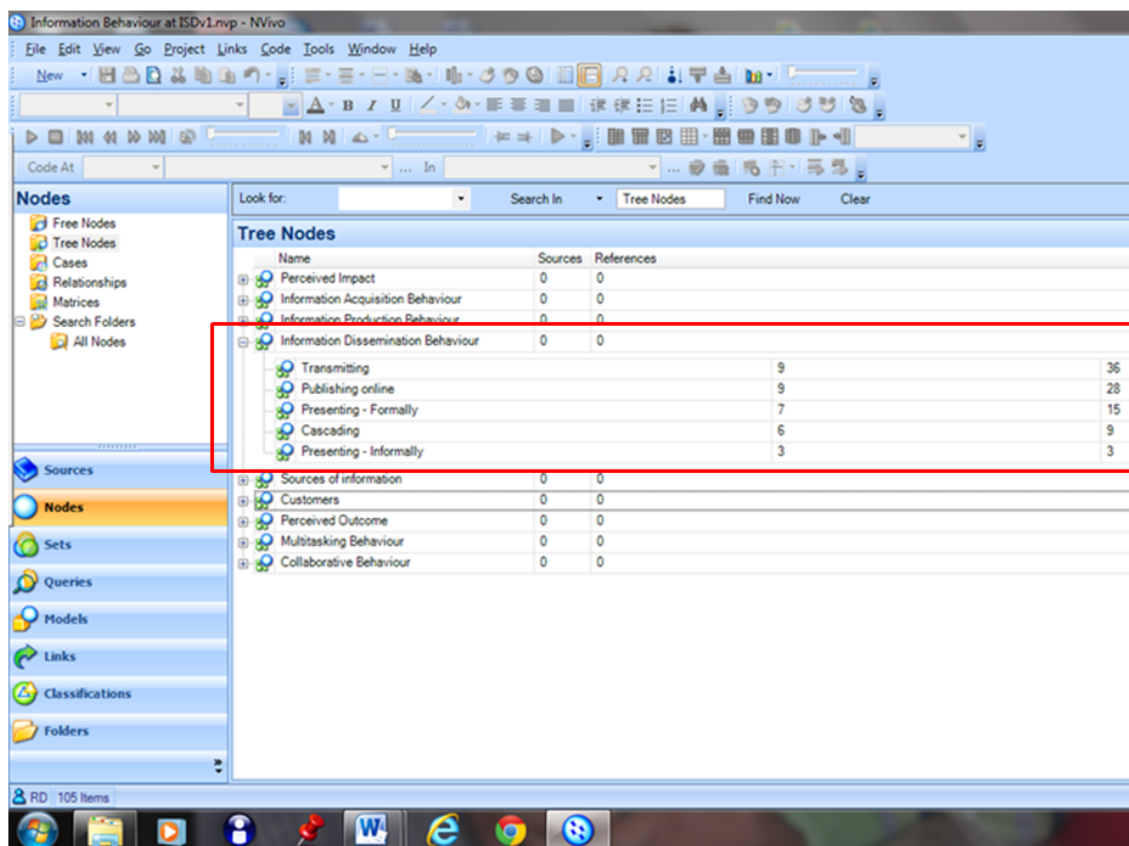
Figure 4.7 An example of theming the data

In Figure 4.7, there are coded segments of texts that were categorised into the following sub-themes: transmitting (36 instances across 9 transcripts), publishing online (28 instances across 9 transcripts), presenting formally (15 instances across 7 transcripts), cascading (9 instances across 6 transcripts), and presenting informally (3 instances across 3 transcripts). In turn these sub-themes were clustered together under the theme (or construct) labelled as information dissemination behaviour shown within the red rectangle in Figure 4.7. The researcher decided on that particular theme because (a) the theme captured all the categories and (b) the theme does exist in LIS literature. The interpretation, resulting in the development of the theme and sub-themes, "helped identify meanings that the participants could not articulate, considering the complexity … of the phenomenon being investigated" (Ajjawi and Higgs 2007, p. 625).

Like Ajjawi and Higgs's (2007) presentations of emerging themes at conferences, the researcher presented preliminary themes at an international conference at Robert Gordon University, UK, a national workshop at Loughborough University, and two doctoral symposia at Robert Gordon University, UK with audiences "other than the [present study's] participants to test the clarity and meaningfulness of the findings" (Ajjawi and Higgs's 2007, p. 626). In addition, the researcher discussed his methods and findings with PhD graduates and students during two PhD researcher conferences held in Edinburgh, UK and Glasgow, UK and gained valuable feedback from conference and workshop participants with regard to their understanding of the emerging themes. The challenge in theming the data was reducing the number of codes/sub themes and clustering them together to form themes. Being in contact with the research participants informally during the analysis stage helped especially when they would ask about the researcher's progress and the researcher would take that as an opportunity to receive informal feedback on the emerging sub-themes and themes.

The themes and sub-themes were then reported on by using significant statements as evidence of robust interpretive phenomenology. The themes and sub-themes were also used as constructs for developing item scales of a questionnaire that formed the basis of the quantitative phase of the study as discussed in section 4.6.

4.5.7 Respondent validation

A respondent validation exercise, an important step in Colaizzi (1978) informed Heideggerian interpretive phenomenology and a requirement in postpositivism, was conducted as the formal way of checking the robustness of the researcher's interpretation of the research participants' descriptions of their experiences of information behaviour and their perceptions of the effects of information behaviour. This was a workshop that was carried out on conclusion of the quantitative phase of the research and the results

merged with the qualitative research findings as part of the mixed methods research methodology. Further details of the respondent validation exercise are discussed in section 4.7.

4.5.8 Reporting final interpretation and model

Following respondent validation, the finalised themes and sub-themes were used to map, in writing, the journey of data/information as they entered the organisation, went through various value-added processes and then left the organisation while, all along the way, information workers were having various experiences of information behaviour that could be brought together into a structure that represented a model of information behaviour of the information provider. The findings are discussed in greater depth in subsequent chapters.

In reporting the final interpretation, it was planned that all the key deliverables will be available for meeting the objectives of the present study and answering the research questions. A visual representation of a model of information behaviour was also developed to illustrate the model of information behaviour of the information provider.

4.5.9 Awareness of potential bias

During the process of interview and analysis, the researcher was mindful of a number of situations that have the potential to reduce or increase bias. One situation was the relationship between the researcher and the interview participants in that the interview participants were not strangers and were known to the researcher. This may either have the potential for cooperation, trust and honesty of participants' descriptions or a revelation of experiences that the participants perceive as providing the researcher with information that he requires rather than their reality. The researcher planned to mitigate this bias by ensuring that the participants' consents were as informed as possible so as to ensure that their descriptions were an accurate reflection of their reality. Also the themes that emerged from each of the participants' accounts revealed similarities across transcripts which satisfied the researcher that there was honest cooperation from the participants.

Another situation is the pre-understandings and foreknowledge of the workings of the organisation that the researcher has, having worked in the same environment as the research participants. It was essential that the researcher was very mindful of this so as to allow space for actively listening to the descriptions of the participants and be open to discovering new insights of "opinions, feelings, emotions and experiences" (Denscombe 2007, p. 175) that the researcher would never have been aware of.

Denscombe (2007) argues that the personal identity and characteristics of the interviewer may have an effect on the degree of openness of the accounts from interview participants. In the present study, the researcher was aware of this potential issue and ensured that the interview participant was well relaxed before the start of the recorded interview by engaging them in general conversation to break down any barriers and make them become relaxed and trusting of the researcher. It was quite evident, from the personal field notes of the researcher during interviews that the participants became quite engaged in their accounts of their experiences which were evidenced by the absence of dissonance between their body language and their speech during interview.

The accuracy of the researcher's interpretations of the meanings of the participants' experiences was another potential issue. Kvale and Brinkmann (2009) used the term *biased subjectivity* to refer to when researchers are blind to extracts of accounts of interview participants that challenge the researcher's personal opinions and conclusions. Kvale and Brinkmann (2009) also presents the issue of accuracy of interpretation whereby, if there were another researcher colleague, their own interpretations may have differed quite considerably from the researcher's interpretations. To mitigate this potential problem, the researcher engaged the research participants in informal updates during analysis and a formal respondent validation exercise to test the researcher's interpretations at the end of the analysis.

4.6 Quantitative phase

The quantitative phase of the research provided an opportunity to develop an instrument with the findings of the qualitative phase, test the instrument on the population of information workers and use the instrument to answer research questions 2 and 3 while satisfying research objectives 3, 4 and 5.

4.6.1 Developing the instrument

4.6.1.1 Choosing an online questionnaire

There are a number of methods within survey research to choose from for collecting data. According to Denscombe (2007) and Saunders, Lewis and Thornhill (2009), they include (a) direct observation in which the researcher captures the data from the research participants by looking at the participants engaging in an activity and recording in a standardised format, (b) capturing data from structured records in which physical or electronic documents are the object of the data collection, (c) interviewer-administered questionnaires by face-to-face, telephone or visual media, and (d) self-completion questionnaires by post, email and web. The present study does not require data capture

from documents because the main focus is on people and their experiences; and observation as a method is not permitted in the research.

In the present study, it was decided that self-completion questionnaires would be used as the method of data collection in the quantitative phase. This is because (a) in terms of researcher cost and time they are more efficient, (b) the participants will not be influenced by the presence of the researcher/interviewer and can complete the questionnaire in their own time, and (c) self-completion questionnaires facilitate distance between the researcher and the survey participants thus increasing objectivity and reducing interference from the researcher.

It was also decided that the self-completion questionnaire will be web-based (online) rather than sent by post or email. The reasons were as follows:

- Online questionnaire are cost effective in terms of expenditure and time and the researcher only requires disseminating the address of the website to the participants rather than the questionnaire itself.
- Some online survey applications have the facility to export the data into other applications such as spreadsheets and statistical analysis software.
- Having had experience of working in the research location, the researcher was fully aware that culture of the organisation was such that information workers were used to participating in regular web-based surveys; so there were no obvious grounds for unfairness and also the potential weaknesses of online surveys to the general population with regards technophobia and junk mail perceptions were not applicable.
- Online survey applications can provide real-time feedback on the number of survey responses and other basis analyses which is essential for triggering reminder notifications to potential respondents.
- Many online surveys can allow the respondents to create passwords so that they can complete the survey in their own time in more than one sitting.

Fricker and Schonlau (2002) and Evans and Mathur (2005) highlight the effectiveness and cost-effectiveness of online surveys. Fricker and Schonlau (2002) and Evans and Mathur (2005) reviewed a wide range of empirical studies that used self-administered questionnaires and concluded that online surveys produce a higher response rate than the other forms of self-administered questionnaires when used in small specialised populations and populations in academic institutions. Fricker and Schonlau (2002) and Evans and Mathur (2005) however asserted that the researcher must be mindful of both the strengths and weakness of online surveys and highlighted the potential for technical

problems emerging when using online questionnaires, anecdotal evidence about possible shorter attention span by the respondents, privacy issues, and the impersonal nature of online questionnaires. Nevertheless Fricker and Schonlau (2002) and Evans and Mathur (2005) concluded that the merits of (a) speed of completion, (b) low survey data administration, extraction and analysis costs, (c) high response rates, (d) control of answer order, (e) the ability of the respondents to complete the survey at a time of their convenience and (f) the ability of the researcher to use the online survey application to examine survey behaviour of the respondents ensure that online surveys have significant advantages over their weaknesses.

4.6.1.2 Items and scales

The sub-themes that emerged from the qualitative phase were used as items and the themes were used as scales in the development of a questionnaire for pilot. In addition, demographic questions were asked of the participants in order to satisfy research objectives 3 and 4.

The final questionnaire, with all amendments following pre-testing and content validation, is shown in appendix 6. The questionnaire was developed using the steps for constructing a questionnaire presented in Peterson (2000). Peterson (2000) recommended that the researcher should determine the types of questions asked (that is, open and closed questions), the wording of the questions, the structure of the questionnaire, and an evaluation of the questionnaire. Against this background, it was decided to add 'neutral feelings' to the questionnaire as an addition to the list of subtypes of feelings identified during interview. Authors such as Pucci (2010) and Tenopir et al (2008) identified the existence of neutral feelings. They were illustrated by words such as calm (Pucci 2010) and careless, ignore and indifference (Tenopir et al 2008). With none of these words or their synonyms having been identified at interview, the researcher's pre-conceptions influenced the inclusion of neutral feelings in the questionnaire in order to provide a balance of choice of feelings for those participating in the survey.

Although most of the questionnaire comprised closed questions which have the advantages of being easy to complete and easy to "code and analyze and interpret" (Peterson 2000, p. 38) due to the standardised response options, open questions were used as well. The open questions were confined to the end of each of the 6 sections of the questionnaire so as to capture comments about each section of the questionnaire and allow the respondent to express themselves (Denscombe 2007). This was particularly important because the questionnaire was an original development and was developed specifically for capturing data related to information behaviour of the information provider

so comments from the respondents would be a useful option to help with work beyond the present study.

The closed questions were worded so that rating scales could be used to code the responses. The two types of rating scales used in the pilot questionnaire's non-demographic scales were the frequency format (never, hardly ever, some of the time, most of the time) and the agreement format (strongly disagree, disagree, neutral, agree, strongly agree). For the demographic questions (gender, years of service, work area, age group), there was no need for rating scales because the questions captured only factual Information (Denscombe 2007). The questionnaire therefore comprised a mixture of nominal variables (e.g. gender), ordinal variables (e.g. frequency of browsing the internet), and an interval variable (i.e. years of service in ISD).

The questionnaire was structured in such a way as to map the flow of information through the organisation a manner based on the output of the analysis of the interviews. The first section focuses on capturing the frequency of responding to various customers of information with an open question for comments at the end. Section 2 of the questionnaire focuses on the frequency of engaging in various core information activities, the frequency of their feelings and emotions that arose thereof, the agreement of their perceptions of the impact of their information activities, and an open question at the end to gather comments and opinions about the questions in that section. Sections 3 and 4 are of a similar format except for the list of core activities which are different and represent the next stages of the flow of information through the organisation. Section 5 focuses on capturing the frequency of engaging in associated activity types related to multitasking and collaborating with an open question for comments at the end. Section 6 captures their factual demographic characteristics with an open question for comments at the end.

4.6.1.3 Evaluating the questionnaire

Peterson (2000) recommends that the questionnaire developer engages in some form of piloting. Peterson (2000) adds that, depending on its purpose, it could be as straightforward as pretesting - in which a purposive sample of volunteers is asked to complete a questionnaire and offer their thoughts and comments about the questionnaire - to engaging in a small-scale pilot study with the data being analysed and reported.

It was decided to engage a group of participants to determine the content validity of the draft questionnaire and also pre-test the questionnaire, rather than conduct a small-scale pilot study. This was because:

- Peterson (2000) recommends at least 60 individuals for a small-scale pilot study and it would have been impossible to find and recruit such numbers of relevant participants who were not part of the study population.

- The purpose of developing the instrument was not an end in itself but to add to the findings of the interview as part of a qualitatively-driven mixed methods research and answer research questions; and so it was important that the respondents found the questionnaire easy to understand and complete.

- The scales were developed by supervised clustering of items in that they were manually clustered in accordance with the categories/sub-themes of information behaviour and related constructs that emerged from the interviews.

Section 6.5 in Chapter 6 discusses and reports the validity (internal, external and construct) and internal consistency reliability (Cronbach's coefficient alpha) of the quantitative phase.

4.6.2 Content validity index

Content validation is a part of instrument validation which ensures that knowledge that is generated by empirical research is scientifically valid and enables the examination of item representativeness of the constructs under study (Kim 2009). It is usually carried out by panel members who are expert enough to express their perceptions of the overlap of items with the constructs of interest and make decisions as to whether they should be retained, modified or discarded (Kim 2009, Schilling et al 2007). In most studies where instruments are developed, content validation is usually a precursor to factor analysis and principal component analysis which comprise a series of statistical techniques for "identifying groups or clusters of variables" (Field 2009, p. 628) in a questionnaire. However, in the present study it is not necessary to conduct factor analysis and principal components analysis because, being qualitatively-driven mixed methods research, the scales have been derived from the constructs that emerged from the interview data and therefore, there has been supervised clustering of the interview constructs to develop the scales and items for the questionnaire. For factor analysis and principal component analysis to be reliable, there must be at least 10-15 participants per variable (Field 2009). In addition, Hinkin (1998) recommends that a minimum of 200 respondents is necessary for factor analysis of a survey questionnaire. The small population (N=81) of the study location and related populations elsewhere in the wider organisation cannot enable the questionnaire to qualify for factor analysis and principal component analysis.

Polit, Beck and Owen (2007) sought to determine whether content validity index (CVI) is acceptable evidence of content validity of a survey instrument. Polit, Beck and Owen's

(2007) rationale for embarking on their appraisal of CVI was that, while CVI is an indicator of inter-rater agreement, there have been critics of CVI who emphasise that there may be a risk of chance in securing inter-rater agreement using CVI. Polit, Beck and Owen (2007) emphasised that common alternatives to CVI such as content validity ratio (CVR) and index *T* are respectively difficult to interpret, in the case of CVR, and does not indicate which item should be refined or discarded, in the case of index *T*. They looked towards the multi-rater kappa statistic "because kappa provides information about degree of agreement beyond chance" (Polit, Beck and Owen 2007, p. 461) and proved that kappa and item CVI on a 4-point rating scale converged as the numbers of raters increased. With 8 raters, the probability of chance agreement in CVI is negligible and the safest generalisation is that an item CVI greater than 0.78 is excellent and implies item relevancy irrespective of the number of raters (Polit, Beck and Owen 2007). Lynn (1986), on the other hand, stated that there should be a minimum of 2 raters but also recommended a minimum CVI of 1.00 for up to 5 raters, 0.78 for 9 raters, and 0.8 for 10 raters.

Grant and Davis (1997) argue that an important step in selecting the panel of raters for determining the content validity index is to ensure that they are familiar "with the conceptual underpinnings and measurement model of the instrument" (p. 269). With this in mind, a convenience sample of 10 participants who were familiar with the constructs in the instrument was invited to participate. To gain their acceptance and understanding of their task, individual meetings between the researcher and each recruit were scheduled. Each participant was provided with an explanatory letter adapted from Grant and Davis (1997) shown in appendix 7. Each participant was also provided with a copy of the draft questionnaire and the list of coded items and rating scales as shown in appendix 8 to ensure that there was a contextual understanding of the items within the questionnaire. The copy of appendix 8 that was made available to participants excluded the items shown in bold and red font because they were only added following the feedback from the raters as will be described later in Table 4.9 in this section. All participants had prior experience of working in the study location and/or knowledge of the type of activities that take place in the study location through current interactions with information workers in the study location. Of the 10 participants, 5 of them coincidentally held doctoral degrees and had instrument development experience as well as being familiar with the constructs of interest in the questionnaire.

As shown in appendix 7, the participants were given a list of the clusters of items to rate whether the items were relevant or not as well as whether modifications to the items were necessary. They were asked to use a 4-point scale, derived from Lynn (1986), to rate the relevancy of items to the information behaviour construct as follows:

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1 – Item not relevant

2 – Item not relevant because it requires complete change

3 – Item relevant but requires minor modifications

4 – Item relevant

The participants were also asked to provide any comments on the items and suggest any new items. If more than one participant suggested the same new item, then that item was added to the list. This was consistent with the content validation method employed by Erfanmanesh, Abrizah and Karim (2012) who sought to develop and validate an information seeking anxiety scale and Gordon, Blum and Parcells (2010) who sought to psychometrically test an assessment tool.   There are two types of CVI that are determined and reported as follows:

- The item content validity index (I-CVI) is the number of raters giving a rating of 3 (relevant but requires minor modifications) or 4 (relevant) to each item divided by the number of raters (Gordon, Blum and Parcells 2010, Schilling et al 2007, Waltz, Strickland and Lenz 2005, Grant and Davis 1997).

- The scale content validity index (S-CVI) is the number of items given a rating of 3 (relevant but requires minor modifications) or 4 (relevant) by all the participating raters divided by the number of items; and is derived from the I-CVI results (Gordon, Blum and Parcells 2010, Schilling et al 2007, Waltz, Strickland and Lenz 2005, Grant and Davis 1997)

Lynn (1986) explains that when 10 participants rate questionnaire items, to establish content validity beyond the 0.05 level of significance, the content validity index (CVI) must be ≥0.8. Table 4.8 shows the minimum CVI required for an item to be retained as well as the minimum number of raters that must endorse an item as relevant (that is, rated as 3 or 4) beyond the 0.05 significance level.

Table 4.8 Proportion of raters required to establish content validity beyond 0.05 significance level

(Adapted from Lynn 1986).

Number of raters	Minimum CVI for item to be retained	Minimum number of raters that must endorse an item as relevant
2	1.00	2
3	1.00	3
4	1.00	4
5	1.00	5
6	0.83	5
7	0.86	6
8	0.88	7
9	0.78	7
10	0.80	8

In the present study with 10 participants involved in rating the questionnaire items, the I-CVI for every item rated was 1.00 and therefore greater than 0.8, thus meeting Lynn's (1986) guidance as shown in Table 4.8. The collated ratings scores of all the participants is shown in appendix 9. Every item was deemed relevant by all 10 raters as evidenced by their rating score per item of 3 or 4. For 10 participants to rate every item as relevant, then a typical I-CVI for each item is calculated as follows:

I-CVI = no. of raters scoring the item as relevant ÷ no. of raters

= 10 ÷ 10

= 1.00

Based on the I-CVI scores, the S-CVI was calculated as follows:

S-CVI = no. of items rated relevant ÷ no. of items

= 151 ÷ 151

= 1.00

It must be emphasised that CVI is subjective and therefore based on the judgement of the participants using their experience and knowledge of the construct under study. So, while it is an acceptable method of demonstrating rigour and used widely in instrument development, the researcher is cautious about any grand claims about the instrument.

The feedback and comments about the items from the raters, together with the actions to amend the items are shown in Table 4.9 below. The actions taken by the researcher are also shown in bold and red font in appendix 8.

Table 4.9 Feedback from participants and action taken to address feedback

Item	Raters' comments	Action taken by researcher
Q1l	Include an example of 'other national organisation'	Change item to 'Other national organisation (e.g. information centre in Leeds)
Q3e, Q6e, Q9e	Indicate that 'togetherness' refers to 'camaraderie'	Change item to 'Togetherness (e.g. camaraderie)'
Q4a, Q7a, Q10a	Include examples of 'processes are improved'	Change item to 'Processes are improved (e.g. better decision-making, being proactive, being more efficient, better customer service)'
Q4h, Q7h, Q10h	Expand on 'others are blamed due to undesirable outcome' to make it clearer	Change item to 'Others are blamed when outcome is undesirable (e.g. shifting responsibility to others when something goes wrong)'
Q5b	Add examples of 'checking'	Change item to 'Checking (e.g. validating, proof reading, quality assurance)'
new	Add 'anxious' to list of feelings	'Anxious' added to list of items under feelings and emotions scale
new	Add 'worried' to list of feelings	'Worried' added to list of items under feelings and emotions scale

The content validation exercise therefore resulted in modifications to the draft questionnaire and confidence that the items contained within the questionnaire were

relevant. The questionnaire was therefore finalised for pretesting as described in section 4.6.3.

4.6.3 Pretesting the questionnaire

The purpose of the pretest was to identify any potential issues such as the ambiguity of instructions, sequencing of questions, format of questions, length of questionnaire, opportunity for expanding on responses (Kim 2009) as well as to identify any problems related to question comprehension, and ability to recall and decide on the responses (Tourangeau, Rips and Rasinski 2000). Kim 2009 explains that the pretest subjects should be as similar as possible to the target population. Due to the small size of the target population, it was not possible to select a sample of pretest questionnaire respondents from the target population. It is important that subjects who participate in the pretest do not participate in the main survey because they may remember the earlier draft questions which would cause confusion, thereby contaminating their responses. The next best sample of potential pretest questionnaire respondents was the same 10 participants who took part in the content validation exercise and had knowledge and some experience of the activities of information workers in the target population. They all accepted the invitation to participate in the pretest and the researcher individually met face-to-face with each one of the pretest participants to ensure that they understood the purpose of the pretest and that the emphasis of the pretest lay in gathering qualitative feedback about the questionnaire and testing the online survey application rather than reporting on the analysis of their quantitative data.

An online survey application accessed at http://www.freeonlinesurveys.com was used to build the draft questionnaire for pretesting. The service was free and confidentiality was guaranteed. As shown in appendix 5, to supplement the face-to-face meetings with the pretest participants, an email was sent to them thanking them for agreeing to take part, reminding them of the deadlines for completing the questionnaire, and explaining again the purpose of the pretest. They were also given the web address for the online survey. appendix 5 also includes a typical response to the email explaining that they had completed the online questionnaire and some of them opted to reinforce their feedback in the email which was similar to what they had written in the feedback section of the online questionnaire.

The comments about the questionnaire were mostly similar and were as follows:

- Make all closed questions mandatory to increase the chances of a complete dataset
- The questionnaire is structured well and the concepts are easy to understand

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- The two types of rating scales (*never/ hardly ever/ some of the time/ most of the time* and *strongly disagree/ disagree/ neutral/ agree/ strongly agree*) are clear and unambiguous.

- Time taken to complete the questionnaire was reasonable given the number of variables

- Revise the introductory paragraphs in the questionnaire so that the reader will be very clear about how the questions are structured before they start completing the questions

- Be clear in the introductory paragraphs why the questions about feelings and impact are repeated

All the comments were acted upon and are reflected in the final questionnaire shown in appendix 6.

The survey data provided by the 10 participants were tested within the online survey application to check whether the application could support preliminary frequency analysis and easily export the data into a spreadsheet. It was discovered that the preliminary analysis was not aesthetically pleasing and the data required some degree of manipulation for exporting to a spreadsheet. For the final survey, rather than use FreeOnlineSurveys accessible at http://www.freeonlinesurveys.com, it was decided to use LimeSurvey application accessible at http://www.limesurvey.org that charged a small fee for managing up to 250 responses to an online survey which was built by the researcher. This is because, in the opinion of the researcher, LimeSurvey handled real-time frequency analysis better, could seamlessly export data to a spreadsheet and had a better interface for editing the survey questions. In addition, its user interface for the survey participants was better in terms of its clarity and consistency of layout, which are factors that encourage completion of online survey responses (Dillman 2007, Dillman et al 2009, Dillman, Smyth and Christian 2009).

The next stage of the survey research was to recruit the sample of the population that would take part in the main survey. This is described in the following section.

4.6.4 Sampling strategy

A formula for calculating sample size is presented by Yamane (1967) to calculate the sample sizes from a given population with assumed confidence level, margin of error and level of variability in the population as follows:

$$n = \frac{z^2\,P\,(1-P)\,N}{z^2\,P\,(1-P) + N\,(e)}$$

<div align="right">(Yamane 1967, p. 258)</div>

Where:

n = sample size

z = standard normal variable from statistical tables for a given confidence level

P = proportion of variability

N = population size

e = margin of error of the sample

To calculate the sample size for the population of 81 in the present study, the following assumptions are made:

- The confidence level is 95% (most commonly used in research) and therefore, from statistical tables, z score = 1.96 (Field 2009).
- The proportion of variability, P = 50% = 0.5 in order to obtain the largest sample size
- The margin of error, e = 0.05
- The population size, N = 81

Therefore:

$$n = \frac{1.96^2 \times 0.5\,(1-0.5)\,81}{1.96^2 \times 0.5\,(1-0.5) + 81\,(0.05)^2}$$

$$n = 67$$

The sample size, which corresponds to the number of received responses, should be 67 according to Yamane's (1967) formula. This is consistent with Krejcie and Morgan's (1970) calculated sample sizes based on +/- 0.05 margin of error and 95% confidence level.

The only feasible way to obtain a minimum of 67 responses to a questionnaire from a population of 81 is to sample the entire population. Also, a number of authors (e.g. Watson 2001, Krejcie and Morgan 1970, Coleman 1970, Yamane 1967) have suggested that for small populations (e.g. less than 100) a census study that samples the entire population should be done to eliminate the sample margin of error. Against this background, it was decided to conduct a census survey of the entire population of information workers (N=81).

4.6.5 Conducting the survey

Conducting the census survey involved adopting a strategy of disseminating the invitation to participate in the online survey by asking the team leaders to cascade the details to their teams. This strategy was chosen because the researcher was aware that the online survey had to compete with other regular internal online surveys that information workers were used to receiving by direct email and so had to use a different strategy to encourage a good response.

The team leaders were sent the details of how to access the survey together with introductory material about the rationale, voluntary participation and confidentiality. An email example is shown in appendix 10. Each team leader then updated the researcher about their progress in disseminating the details of the online survey to their staff. This provided the researcher with reassurance that information workers had received the details of the online questionnaire. A typical email response from a team leader is shown in appendix 11. Close to the 2-week deadline for completing the online questionnaire, the responses so far in the online survey application were interrogated for completeness and frequency. As a result of this real-time analysis, the team leaders were sent a reminder to cascade to their staff for completing the survey.

By the deadline date, there were 70 responses out of a population of 81 and the dataset was complete because all the closed questions were mandatory.

4.6.6 Reporting the findings

The data from the survey were exported to the statistical software SPSS (2010) and R (2011) in order to obtain exploratory and descriptive statistical outputs that contribute to meeting objectives 2, 3 and 4. SPSS (2010) is available for student access via Robert Gordon University and has strengths in having a friendly user interface and good analytical power for outputting friendly tables and figures. R (2011), on the other hand, is an open source free download, could be daunting as it is mostly command driven, but its superior data visualisation strengths are useful for clarifying the findings in the present study.

The data were explored to determine the population distribution of the variables and the agreements and opinions of the respondents with respect to the scales in the questionnaire. In addition, the data analysis (a) gives an indication of consistency or lack of consistency between the interview participants' experiences and those of the population by describing and exploring the data using frequency and percentage tables and graphs and (b) determines whether or not associations exist between specific

demographic variables and the items that comprise the modes of information behaviour and feelings as outcomes using cross-tabulation and chi-square tests.

Chapter 6 presents more details about the statistical tests and the findings of the analysis.

4.6.7 Mixing the findings

The findings of the quantitative phase, together with those of the interviews were brought together in order to contribute to meeting all the 5 research objectives.

For research objective 1, the experiences of information behaviour, although captured from the 10 interview participants, were tested in the population via survey questionnaire to ascertain a comprehensive picture of information behaviour experiences by the information workers.

For research objective 2, the categories of information behaviour captured by thematically analysing the interview data were extended, following the content validation of the draft survey questionnaire.

For research objective 3, descriptive statistical analysis of the survey data enabled reporting of item level frequencies and percentages and therefore how prevalent the various activities of information behaviour were in the information worker population.

For research objective 4, statistical tests enabled the determination, if any, of associations between demographic variables and activities of information behaviour and outcome.

For research objective 5, the collective findings of the interview, survey data and respondent validation stages of the methodology contributed towards the development of a model of information behaviour of a provider.

4.6.8 Awareness of potential bias

It is inevitable that in a questionnaire with Likert-type rating scales, some respondents may lose focus after answering a few questions and resort either to select neutral responses or provide responses that they feel the researcher would want to see. It was therefore planned that, with the respondents gaining personal benefits by reflecting on their practice during the completion of the questionnaire they would perceive the questions as having relevancy to their area of work and therefore complete the survey with enthusiasm. Also, the feedback from those who pretested the questionnaire give an indication that the survey is interesting and that they could constantly compare their

practice with the items in the questionnaire. It was also planned that the mixture of the two types of Likert-type scales in the questionnaire would break the monotony of selecting options from the same set of rating scales, thus grabbing the attention of the respondent.

Another potential issue is the power relations between the team leaders and their team members when being encouraged to complete the questionnaire. Again, the risk exists that some information workers may have completed the survey because they were told to do so by someone in authority or became antagonistic towards the questionnaire because they did not like being asked by their team leader to complete the questionnaire. It was planned that communications with respondents should emphasise the voluntary nature of responding to the online questionnaire and as such the team leaders were asked to remind their team members about the voluntary nature of participating in the survey which would mitigate the potential for antagonism or blind compliance.

The researcher is aware that, being a lone student researcher engaged in the design of instrument, collection and analysis of data, and reporting of quantitative findings, there are some limitations which would be mitigated if the functions were carried out by a team of researchers. For example, in a team of researchers, there are more opportunities for division of labour and peer review of each other's work with a fresh pair of eyes, thus minimising opportunities for researcher bias. However, there are strengths in being a single researcher. There is no choice but to be fully embedded in all aspects of the research process and the researcher has the opportunity to capture insights from the quantitative research experience, analysis and findings which are not inadvertently influenced by research peers' interpretations of the various statistical outputs. Also, the student researcher is supervised by academics and interacts with scholars and other research students at conferences and other academic gatherings who would provide valuable feedback and critique of the researcher's approach and findings.

Prior knowledge of the culture of the research location due to prolonged engagement with the environment both as an employee of the same parent organisation as the information workers' and also previous first-hand experience of being an information worker in one of the teams create both opportunities and limitations. Opportunities arise because the methodology can be shaped by an awareness of the organisational culture as evidenced by the cascading method of disseminating the survey questionnaire. Limitations arise because the researcher needs to keep reminding himself to be open to what emerges from the statistical analysis, rather than aim to discover a particular type of output to support personal biases.

4.7 Respondent validation workshop

4.7.1 Why check with research participants?

Respondent validation is grounded both theoretically and ethically (Bygstad and Munkvold 2007, Torrance 2012). It can also be referred to as member review or member checking or member validation. Theoretically, the respondents' experiences of information behaviour are their personal accounts and interpretative phenomenology allows the researcher to interpret the respondents' accounts of their information behaviours and understandings. Torrance (2012) additionally argues that it is incumbent upon the researcher to ensure that the interpretations are a fair, accurate and valid reflection of how the respondents view the phenomenon. Locke and Velamuri (2009) argue that "it is simply the civil and just thing to do for people who have given the researcher their time, words, and acts" (p. 489). The contact between the researcher and the respondents during the respondent validation workshop is an epistemological deed and both Miles and Huberman (1994) and Silverman (1985) recommend that member feedback should be a part of research designs.

The researcher was in contact with the respondents of the qualitative phase of the present study in the early stages of the analysis of their interviews in order to provide updates of emerging findings. However, these contacts were informal and not structured with the purpose of ensuring that the respondents felt a sense of partnership in the research process. Respondent validation is a "strategy for determining the credibility of the researcher's interpretation of the participants' perceptions" (Teddlie and Tashakkori 2009, p. 213). Respondent validation can involve respondents checking their initial interview transcripts or the first interpretive output or the final (polished) draft interpretive output (Creswell 2009, Torrance 2012). Creswell (2009) recommends that respondent validation is best done when the researcher has a polished output. The respondent validation workshop described in this section refers to the output at the end of both the qualitative and quantitative phases of the research when a model is developed. It is referred to as phase 1b of the research (see figure 4.3) because Heideggerian interpretive phenomenology informed by Colaizzi (1978) requires formal feedback from participants at the end of data analysis and interpretation.

Locke and Velamuri (2009) explain that the practice of member review was first associated with qualitative research in order to enhance its quality. However, it remains associated with qualitative research in most textbooks and research studies. While most studies explain that member review has been carried out, very few studies explain exactly how it was structured and implemented. Torrance (2012) explains that, even in mixed

methods studies, there is a tendency to describe respondent validation only for the qualitative part of the study without exploiting the value of respondent validation to the entire mixed methods research. Torrance's (2012) arguments are based on Denzin's (1978) construction of the term triangulation in which Denzin (1978) refers to triangulation as involving the comparison of perspectives using multiple methods or multiple investigators in a single inquiry. Torrance (2012) therefore argues that because respondent validation aims to seek the views of respondents on the researcher's interpretations of the respondent's constructions, then the respondents and the researchers constitute what could be referred to as multiple investigators.

Guba and Lincoln (1989) explain that respondent validation has the following advantages:

- Respondents can amend errors of interpretation
- Respondents can add additional information especially if they had been omitted due to lack of recall during the researcher's data collection phase
- Provides evidence that the respondents have agreed to the researcher's research outputs
- Provides an opportunity for the researcher to confirm the findings

There are caveats to be mindful of when engaging in a respondent validation exercise. Bygstad and Munkvold (2007) argue that there is a risk of unwarranted influence from the research participants on the outcome of an inquiry and that, because the raw data captured from the respondents would have been synthesised and interpreted, the respondents may challenge the synthesised interpretations because they may not represent what they said as individuals. Carlson (2010) warns against researchers letting themselves into a trap during member checking whereby miscommunication between researcher and respondents can result in the respondent giving member feedback that has the potential to threaten the stability of the entire study. Guba and Lincoln (1989) explains that, to mitigate the potential disadvantages of a respondent validation exercise, the researcher should be very open about the research process and facilitate a free flow of information. Carlson (2010) nevertheless asserts that "increasing trustworthiness of the research study is the larger objective or greater good to aim for in a qualitative inquiry" (p. 1110).

4.7.2 The method

Creswell and Miller (2000) explain that the most popular method of carrying out respondent validation is by convening a focus group and the responses to questions asked should be incorporated into the final report. This is supported by Torrance (2012)

who argues that the face-to-face contact between researcher and respondents results in a valid and democratic "co-construction of research knowledge" (p. 8). An interactive focus group style was adopted by the present study. Smith, Flowers and Larkin (2009) recommend 4 to 5 people for a focus group so that there are enough people to generate discussion and not too many to make the group unmanageable. Smith, Flowers and Larkin (2009) also suggest that the roles required are facilitating the discussion, monitoring the discussion and maintaining an ethical environment and adds that these roles can be done by one person or divided between 2 people. Carey (1994) argues that individual participation is enhanced by focus groups and recommends that 5 to 12 members may comprise an optimal group size because of possible lack of cohesion in very large groups and possibility of individuals dominating the conversation in very small groups. However, 4 to 12 members were recommended by Tang and Davis (1995) who reviewed a number of studies and found conflicting evidence that (i) there was no difference in ideas generated in 4-member and 7-member focus groups, (ii) there was no difference in ideas generated in 5-member and 9-member focus groups, and (iii) larger groups generated more ideas than smaller groups. This led Tang and Davis (1995) to assert that, while smaller groups may be more passive and constrained, larger groups may be "too aggressive, impulsive, competitive and inconsiderate" (p. 474). Denscombe (2007) explained that mini-focus groups of 3 or 4 people are quite common in social research. Tang and Davis (1995) concluded that the size should be dependent on the number of questions being asked, allotted time per question, the duration of the session and the format of the session.

The aims of the respondent validation workshop were:

- To establish credibility and integrity of the research findings and interpretations
- To ensure trustworthiness and approval from researcher (self), research subjects and external readers of the research report

The objectives of the respondent validation workshop were:

- To seek contributions and comments about the research findings, interpretations and use from research participants
- To incorporate respondent feedback in the research report

The choice of key questions asked of members of the focus group was adapted from respondent validation focus group questions suggested by Creswell and Miller (2000). They comprised:

- Do the themes and categories make sense?
- Do you believe they are accurate and realistic for your setting?
- Which categories or sub-categories would you remove?
- Which categories or sub-categories would you add?
- How useful are the findings?
- Do you have any general comments?

Prior to inviting the respondents to attend a focus group, the researcher ensured awareness of:

- Personal biases which may inadvertently influence the flow of focus group discussions
- Skills of the researcher which may impact the quality of the feedback
- Group dynamics which have the power to influence the reliability of the feedback
- Lack of population representativeness of the focus group members

It was impossible to assemble together the 10 subjects who took part in the qualitative interviews in order to participate in a respondent validation exercise as one focus group. This was due to 2 reasons. First, one person had retired and two others had left the organisation since the initial interviews. Secondly, it was impossible to secure a time and place that was suitable to the remaining 7 subjects. Therefore the researcher took the pragmatic decision of replacing the missing subjects with other subjects from within the missing subjects' work roles who had participated in the survey research. Also, the researcher had to create 2 focus groups of 5 members each in order to accommodate the availability of every member.

The 2 focus groups were held 6 days apart. During each of the two gatherings, the researcher took the subjects through an introduction that covered the following:

- The purpose of the meeting – aim, objectives and background
- The ground rules – a desire to maximise participation
- Reassurance on issues related to confidentiality – that no person will be identified with any of the statements
- Explanation of how the feedback will be captured by Post-it[®] Notes and researcher's notes

The details of each respondent validation session are shown in table 4.10 below.

Table 4.10 Focus group details

	Number of subjects	Duration (mins)	Comments
Focus Group 1	5	70 minutes	A very enthusiastic group willing to provide as much feedback as possible with very little prompting.
Focus Group 2	5	60 minutes	Another enthusiastic group but more thoughtful than the previous group and asking a series of questions about the research progress before offering feedback.

4.7.3 The process

Every participant, on being invited to the workshop, was given copies of the figures and tables that represented the findings of the research in chapters 5 and 6. This enabled the participants to read and prepare for the workshops. The workshop commenced with a brief presentation to put the findings into context. This was followed by a walkthrough of the draft model of information behaviour which was a combination of the outputs of both the qualitative and quantitative phases. The group members and the interview participant were all enthusiastic in their contributions and it was noted that every person participated without much prompting from the researcher. A lively discussion took place and all the suggestions and comments from the group members were captured for use in the present study. The participants all gave signed consent for their comments to be used in the thesis as long as they were not attributed to any named individual. The process served as a unique opportunity to hear the collective voices of the interview participants and use their feedback to validate the interpretations of their experiences and co-construct a model of information behaviour of an information provider. Further details are presented in chapter 7.

4.7.4 The findings

The findings of the respondent validation workshop are reported in chapter 7 and they represent the voices of the interview participants.

4.8 Ethical considerations

Consideration of ethical issues in the present study has been an on-going process right through from the researcher registering as a PhD student and writing up a proposal, to seeking consent from the study location's gatekeepers and study participants, to gathering data, analysing data and writing up the thesis. Above all this, the PhD research was conducted in accordance with Robert Gordon University's research ethics policy accessible via the research governance and ethics section of the university's website at

http://www4.rgu.ac.uk/researchdegrees/currentstudents/page.cfm?pge=28708 which provides mandatory guidance and forms for regularly reviewing ethical issues, completing the ethics review checklist for submission to the university, and complying with the university's research ethics procedures as set out in the ethics and research governance policies.

Ethical principles in research provide the scaffold for guarding against violations of acceptable practice (Flick 2007). Denscombe (2007) highlights 3 ethical principles that must guide all research activities on humans:

- "Principle 1: The interest of participants should be protected
- "Principle 2: Researchers should avoid deception or misrepresentation
- "Principle 3: Participants should give informed consent" (pp. 143-146).

The following sub-sections discuss how the present study has adhered to each of the three principles.

4.8.1 Protecting the interests of the participants

Robert Gordon University emphasises that doing good (i.e. beneficence) and not doing harm (i.e. non-maleficence) are the fundamentals of protecting the interests of the research participants. In deciding on the methodology for the present study, due consideration was given to the welfare of the participants to ensure that their participation would be beneficial to them in terms of reflecting on their everyday practice to support their personal development both during interviews and when completing the questionnaire. Miles and Huberman (1994) add that research participants benefit from being listened to and from the learning and insights that they acquire. Therefore, there were benefits to each participant for taking part.

It was essential that the gatekeepers' recommendation of minimal participant intrusion was upheld to ensure that their work was not unduly disrupted in any way as a result of taking part. Denscombe (2007) adds that consideration must be given to the fact that there should be no physical and psychological harm to the participants. This was actively considered during the entire research process especially when anticipating the effects on participants for taking part in interviews and answering survey questions. There was no reason to believe that the questions posed to participants were of a nature that would result in physical or psychological harm but this was being monitored all the time during data collection.

It was also ensured that the participants were not exploited in any way. This was ensured by an open and honest face-to-face discussion with all interview participants and the team leaders about the purpose of the research and the voluntary nature of their participation. The participants were also reminded that it was their right to withdraw from the research at any time. A number of research participants participated in the respondent validation exercise during which they had access to the findings of the research which they were free to comment on. In addition to this, research participants were kept updated about the progress of the research and answers provided to any questions they may have during informal encounters with the researcher.

Maintaining anonymity and confidentiality were other key aspects for consideration. Assurances were given at each informed consent seeking stage that the anonymity of the participants and the confidentiality of their data would be preserved. That is, survey responses would remain anonymous, care will be taken to ensure that extracts of participants' statements would not include the personal identities of the individuals concerned, and that the recordings of the interviews and transcripts were securely held by the researcher only for the duration of the writing up of the PhD study so that extracts of their statements could be used in the study. Flick (2007) also supported this approach by advising on securing collected data which should only be kept for as long as needed.

4.8.2 Avoiding deception and misrepresentation

There was no need to conceal anything about the study from the research participants. An environment of openness and honesty was developed in all interactions with research participants and answers were readily provided if any of them required clarification of any issue or answers to any questions. The researcher had no conflicting interests that would jeopardise the trusting and open research relationship with the participants.

It was very important to respect participants' intentions when using foreknowledge and pre-understandings to interpret the experiences of the research participants (Flick 2007). During the respondent validation exercise, participants were spoken to in such a way that information science terminology that they would not necessarily understand was avoided, as also recommended by Flick (2007). Throughout the research process, the researcher was mindful of ensuring that there was no hint of coercion, persuasion and manipulation of research subjects (Miles and Huberman 1994) or misinterpretation of results.

4.8.3 Securing informed consent

The importance of securing information consent lies in the following questions which the researcher asked himself: "Do the people I am studying have full information about what the study will involve? Is their consent to participate freely given – fully voluntary and

uncoerced?" (Miles and Huberman 1994, p. 291). Denscombe (2007) explains that research participants must have enough information to help them make a decision as to whether or not to participate. To achieve this in the present study, the gatekeepers were first to satisfy themselves about the details of the research and the absence of a significant ethical issue and then gave permission to proceed. Secondly, the interview participants were met face-to-face individually to explain the purpose of the research and answer any questions they may have. Thirdly, there were opportunities at every stage of data collection for participants to terminate their participation. For example, in the questionnaire, at the end of the introductory material, the respondents were given the choice to opt out of the survey even though their team leaders had explained to them about the voluntary nature of their participation.

Having been fully informed about the purpose, confidential nature and benefits of interviewing, research participants were given the opportunity to sign an informed consent form or email the completed form to the researcher which acted "as a way of formally recording the agreement to participate and confirming that the participant has been informed about the nature of the research" (Denscombe 2007, p. 145). The informed consent form (see appendix 17) was designed using key information in a standard template recommended by Denscombe (2007) that cover research study information, right to withdraw, and data security and confidentiality.

4.9 Summary

This chapter has set the path for pragmatism being the philosophical tether for answering the research questions and meeting the objectives of the study. With pragmatism being the philosophical partner for mixed methods research, the study adopts a pluralistic approach in terms of ontology, epistemology and methodology as evidenced by interpretivism for the qualitative phase on one side, and postpositivism for the quantitative phase on the other side, of an epistemological continuum. It is also evidenced that some LIS studies have also successfully employed different approaches to pragmatism. It is emphasised that the mixed methods research is qualitatively driven which is evidence of the focus on the experiences of the small group of interview participants whose realities comprise the driving force behind the development of a model of information behaviour of an information provider, with the other data collection strategies being to enhance and check the interpretation of their realities.

A case for adopting a phenomenological approach for the qualitative phase is made while being aware of the many other qualitative approaches that exist but would not have been the best choice. Furthermore, Heideggerian interpretive phenomenology informed by

Colaizzi (1978) is selected as the most appropriate approach due, in part, to its flexibility in the spirit of pragmatism and its rejection of the notion of bracketing of pre-understandings and foreknowledge. The data collection method for the qualitative phase is discussed in depth including the justification for using critical incident technique for collecting value-added information behaviours and the non-prescriptive interpretive phenomenological methods for analysing the data in the form of coding, categorising and theming. The piloting of the interview protocol resulted in a refined protocol for capturing qualitative data.

Likewise, for the quantitative phase, a census survey is chosen as the way forward for testing for associations between key variables and enhancing the outputs from the qualitative phase. An instrument is developed, content validated, pre-tested, refined and then used in the field via a bespoke online survey application for collecting data. A census survey was conducted because the population was too small and which would render a survey of a sample of the population too risky for obtaining the required number of responses.

To complete the mixed methods process, a respondent validation workshop was carried out to meet the requirements of interpretive phenomenology where the researcher meets again with the interview participants to receive feedback on his interpretation of their constructions. Hearing the voices of the research participants also facilitated the process of developing a model of information behaviour of the information provider.

This chapter has also presented a framework for research quality which seeks to provide evidence that the research has high truth value, applicability and consistency while adhering to the three main ethical principles of protecting the interests of research participants, avoiding deception and misrepresentation, and obtaining informed consent.

CHAPTER 5: Findings of the Qualitative Phase

5.1 Introduction

This chapter presents the findings of the analysis and interpretation of the critical incident interviews following rigorous coding, categorising and interpretation within the Heideggerian hermeneutic phenomenological methodology explained in chapter 4. It commences with an overview of the findings that not only include a pictorial representation of the themes but a summary interpretation of information workers' experiences of information behaviour. Thereafter, each theme is examined in turn where definitions, interpretations and evidence from interview transcripts are presented. Evidence of quality and rigour of the qualitative phase is also presented in order to demonstrate to the reader and future researchers the degree of trustworthiness of the research. The findings of the respondent validation exercise that followed the quantitative phase are presented in chapter 7.

When introducing each major theme from section 5.4 onwards, column charts are used to visualise the frequencies of the information behaviour subtypes in terms of the number of interview participants experiencing the behaviour (sources) and the number of mentions of the behaviour during interview (references) so as to help with interpreting how the information behaviour subtypes are experienced throughout ISD. Onwuegbuzie and Dickinson (2008) argue that "scant attention has been paid regarding graphical displays in qualitative data" (p. 205) and argue strongly that, in mixed methods research, descriptive statistics for both the qualitative and quantitative components enhance the description and interpretation of the phenomenon of interest.

5.2 Overview of the findings

The 10 interviews yielded 70 critical incidents that covered the various activities associated with information behaviour. This was more than the minimum of 50 critical incidents as recommended by Flanagan (1954). It was apparent that the 10 interviews were enough to reveal the breadth and depth of ideas necessary for examining the phenomenon of information behaviour – that is, the interview transcripts had enough saturation to reveal the range of experiences, feelings and perceptions necessary for understanding the phenomenon under study because no new concepts were emerging during coding of the ninth transcript. This was despite the fact that the critical incident technique, as explained in chapter 4, was only limited to the data gathering phase and not the data analysis phase. In addition, as explained in chapter 4, the purpose of the interviews was not to secure data saturation but, rather, to focus on the experiences of the 10 volunteer interview participants who had enough experience of the work of their

teams; but data saturation became a by-product of the process. The data analysis therefore supported the view that the purposefully selected interview participants had enough experience and knowledge of their work area to "illuminate the phenomenon" (Ajjawi and Higgs 2007, p. 616) in such a way that no new insights would have emerged if the number of purposefully selected interviewees were increased.

Each of the 10 interview participants was assigned a code in order to provide evidence of excerpts of texts to support the interpretations. The codes were totally random and there were no hidden or overt meanings within each code. This was so that the anonymity of the interview participants would be preserved. Coding of the transcriptions within the NVivo software environment was repeated until no new insights about the phenomenon of information behaviour and associated concepts were apparent. Likewise, the process of theming the coded data was repeated until there was satisfaction that the themes were a representation of the interview participants' experiences and could be used to develop a survey questionnaire for the next stage of the research. These procedures followed Colaizzi's (1978) guidelines as described in chapter 4.

The phenomenological themes presented in this chapter represent ""structures of experience" (Ajjawi and Higgs 2007, p. 622) which include associated feelings and perceptions and provide significant statements from the transcripts of interviews that represent evidence that the descriptions and interpretations of the constructs were grounded in the interview data.

The nine themes that are presented in sections 5.4 to 5.11 are shown in figure 5.1 below. The names of five of the themes – information acquisition behaviour, information production behaviour, information dissemination behaviour, multitasking information behaviour, and collaborative information behaviour – were the bottom-up interpretation of the clusters of similar sub-themes from the interview data within the NVivo software environment; whereas the other four – feelings as outcomes of information behaviour, perceived impact of information behaviour, sources of information and customers of information – were concepts that required to be captured as part of the conceptual framework and the research questions in chapter 3.
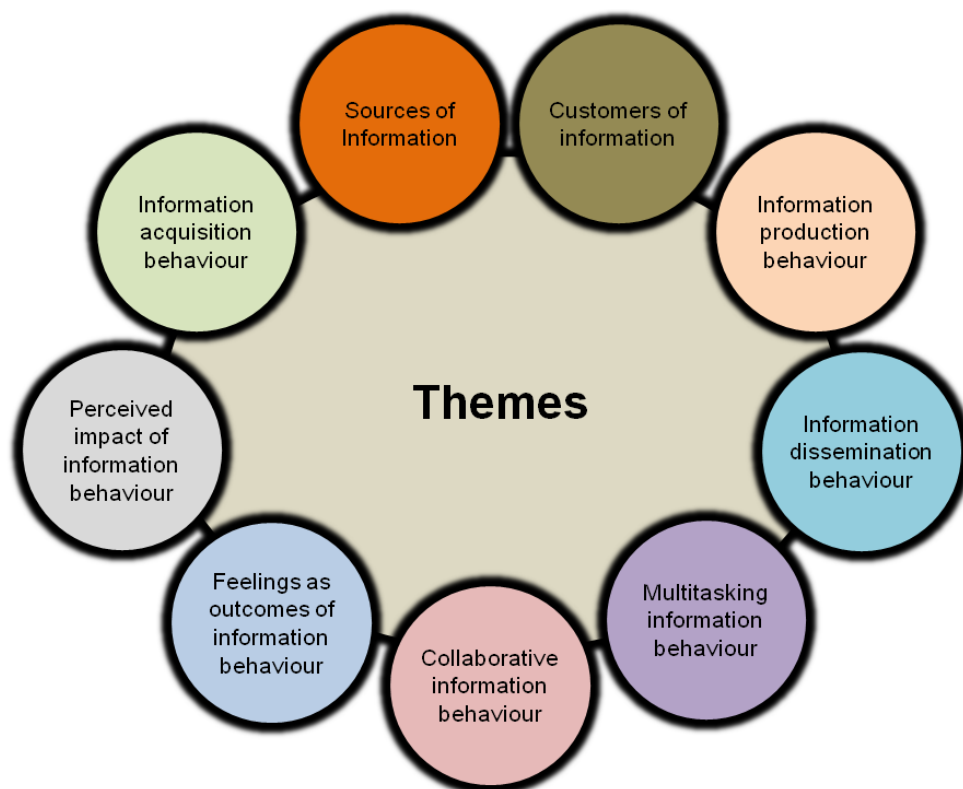
Figure 5.1 The 9 themes related to experiences of information behaviour

5.3 Interpretive summary

The hermeneutic strategy, as discussed in chapter 4, for arriving at the themes has involved using the researcher's "theoretical and personal knowledge … to explicate meanings and assumptions in the participants' texts" (Ajjawi and Higgs 2007, p. 616). In doing so, hermeneutic alertness (van Manen 1997) was maintained and it involved taking time to reflect on meanings of the extracts of the texts rather than accepting experiences as they are or allowing the researcher's preconceptions to obnubilate what the research participants intended to articulate. "The goal of hermeneutic inquiry is to identify the participants' meanings from the blending of the researcher's understanding of the phenomenon, participant-generated information, and data obtained from other relevant sources" (Wojnar and Swanson 2007, p. 177). This can be summarised in an equation as follows:

$$\begin{matrix} \text{Participants'} \\ \text{meanings} \end{matrix} = \begin{matrix} \text{Researcher's} \\ \text{understanding} \end{matrix} + \begin{matrix} \text{Interview} \\ \text{data} \end{matrix} + \begin{matrix} \text{The} \\ \text{literature} \end{matrix}$$

The 3 elements on the right-hand side of the equation were synthesised during analysis within the NVivo qualitative software environment from which the outputs shown in figures 5.2 and 5.3 emerged. Together, they not only shaped the researcher's interpretations of the meanings that the research participants were attempting to convey, but also helped

the being-in-the-world existential relationship between the researcher and the world of the research participants. In arriving at the researcher's understanding, as explained in chapter 4, there was an unremitting process of extracting, as part of the coding process, and then relating significant statements from transcripts to the whole of the interview transcripts so that they were "understood in terms of their relationship to the larger whole" (Parsons 2010, p. 65). The interview data were the source of the evidence for facilitating the researcher's understanding and the literature served as the theoretical and empirical tether for the researcher's forestructure and pre-understanding.

The purpose of figures 5.2 and 5.3 below is to act as a reference point so as to help visualise the concepts discussed in this interpretive summary section and throughout the rest of the chapter. Figure 5.2 shows 'information behaviour of an information provider' as the phenomenon under study from which 3 themes that represent core information behaviours emerge – (i) information acquisition behaviour, (ii) information production behaviour, and (iii) information dissemination behaviour. Each of these themes, in turn have their sub-themes (or categories) which are shown in figure 5.2 but discussed in detail from section 5.4 to 5.11. Likewise, 2 themes that represent associated information behaviours emerge – (i) multitasking information behaviour and (ii) collaborative information behaviour together with their respective sub-themes or categories. They are associated behaviours because they were found to occur within and between each of the 3 core information behaviours.
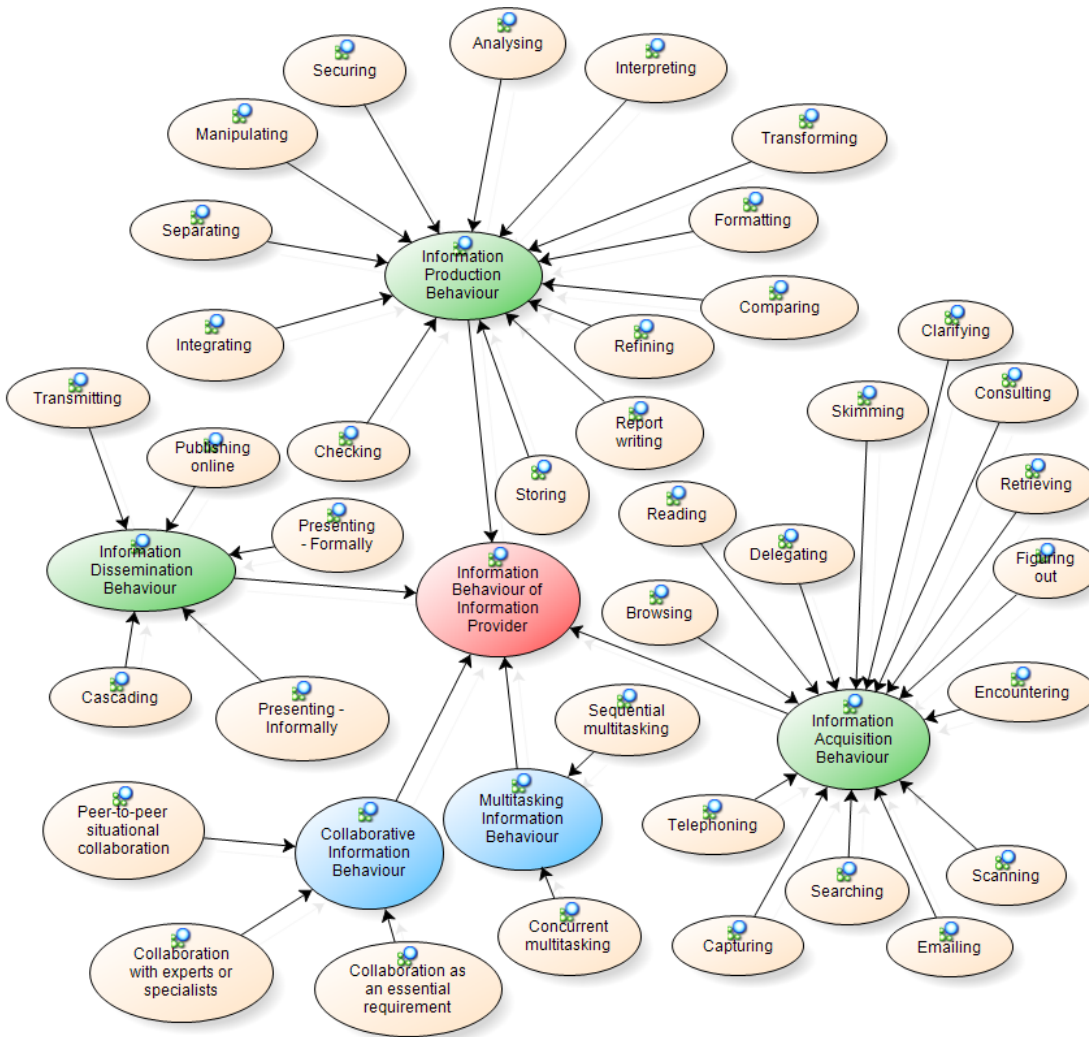
Figure 5.2 NVivo output: Themes and sub-themes (categories) for core and associated information behaviours

Figure 5.3 is a continuation of the NVivo output shown in figure 5.2 with an emphasis on the pre-determined themes highlighted in the conceptual framework. The 'feelings' theme is divided into positive and negative feelings and their respective sub-themes or categories are shown. The 'perceived impact' theme, together with 'sources of information' and 'customers' themes are also shown together with their sub-themes. Their sub-themes are discussed in detail from section 5.4 to 5.11. The core and associated information behaviours in relation to the phenomenon of information behaviour of information provider are also shown in figure 5.3.
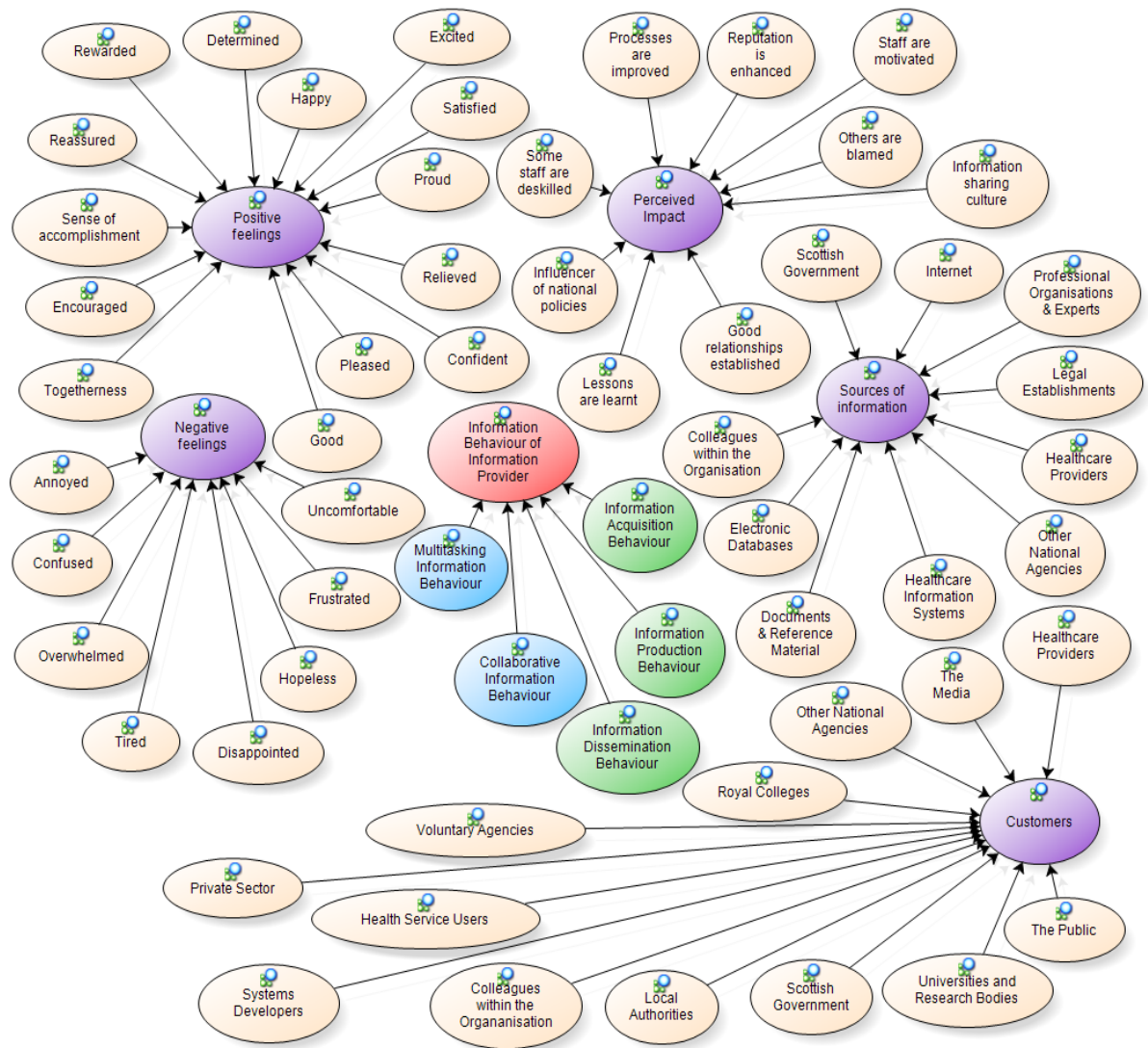
Figure 5.3 NVivo output: Themes and sub-themes (categories) related to the whole experience of information behaviour

The information workers in the information provider organisation engage in numerous information activities that can be clustered and referred to as information behaviour. They respond to a variety of customers, both internal and external, who either express a need for information or require continuous or updated information and intelligence on health and social care related activity. These customers therefore serve as triggers of information behaviour of the information workers. Likewise, the information workers sometimes choose to become curious in order to increase their personal knowledge, strengthen their information horizon or look for ways of enhancing the service they provide and so these personal processes serve as triggers for engaging in information activities that may include making connections with information that they accidentally encounter.

To respond to the needs of the customers, the information workers engage in information activities related to getting or acquiring information. They include setting up electronic data collection systems and capturing the data that are transmitted to the systems; or retrieving data or information from already established electronic databases; or engaging in numerous other information activities related to information acquisition behaviour as illustrated in figure 5.2. As they engage in information acquisition behaviour, they also engage in information activities related to multitasking and collaborative information behaviours whose sub-behaviours are also illustrated in figure 5.2. Multitasking behaviours, in the information workers' opinion, tend to help them become more efficient especially when they work under pressure and are continually interrupted to attend to other pressing matters. Collaborative information behaviours tend to add some degree of authenticity to their outputs and acquire buy-in from interested stakeholders. Some information workers, by their nature of their job role spend a large portion of their time engaged in information activities related to information acquisition behaviour. Others spend little time in these activities because the bulk of their work is concerned with other forms of information behaviour. However, to engage in information acquisition behaviour, the information workers access numerous sources of information that range from people to systems and databases to organisations to documents and the internet as illustrated in figure 5.3. Overwhelming positive feelings emerge when information workers engage in information acquisition behaviour and they are related to the workers having a satisfactory outcome – that is, they get the data or information they were either looking for, or setting out to capture.

Particular groups of information workers mostly engage in information activities related to the production of information in response to a need for information. Information production behaviour comprises several information activities related to processing, storing, and preparing for dissemination as illustrated in figure 5.2. There is a desire in the minds of the information workers to ensure that the production activities are carried out in a way that makes the customer satisfied with the product or service. However, the journey for getting there is sometimes fraught with problems. They sometimes encounter difficulties in the processes of production and collaborative working which result mostly in feelings of frustration; the reason being that the quality of the service for the customer is always uppermost in their minds. Most of the time, the difficulties arise due to factors beyond their control, such as IT-related problems, and these only add to the negative feelings that they may experience. The information workers are evidently customer-focused and are driven to complete the information production activities to a standard that they perceive as high. While engaging in these activities, they multitask and collaborate for the same reasons as they or others would do in the information acquisition phase. However, collaborative working is very common because the value of the product is

enhanced when various individuals make contributions of their knowledge and expertise to the synergy of a product. Information workers express satisfaction with successes in the production environment with positive feelings of pride, happiness and that determination to press ahead in the face of difficulties, in addition to the other feelings illustrated in figure 5.3.

The third core information behaviour – information dissemination behaviour – is experienced when the information worker gives away information or intelligence to the customers who need them. However, they not only engage in those dissemination activities for the benefit of the customers who initially required the information, but also for the benefit of colleagues or other audiences at, for example, conferences and informal meetings who would also benefit from receiving the information. One example, is doing informal presentations to team members for the purposes of sharing information and and/or seeking feedback. It is at the stage of information dissemination behaviour that the information has the highest value because it has been acquired and gone through the production processes with input from various individuals to prepare it for the dissemination stage, while all the time acquiring and building on its value along the way. As with other core information behaviours, multitasking and collaborative information behaviours occur alongside information dissemination behaviour. When dissemination activities are successful and go according to plan, the information workers are wrapped up in positive feelings and when the opposite occurs, they express negative feelings. This is also evidenced by their animated physical expressions when conveying their experiences and perceptions to the researcher during interview.

There is evidence that the experiences of the information workers do not always support a linear representation of information behaviour. For example, an interview participant states: "people are going out and are collecting the information, bringing it back, and then I work with them on analysing it". This shows that the participant's work role is predominant in that domain between information acquisition and information dissemination which is known as information production and it is at that point that the participant adds value to the information that has been flowing through the organisation. At other times, the customer only wants raw data with no processing involved. This means that when once the data is captured, it is disseminated to the customer without going through a production process. Multitasking information behaviour occurs as information workers engage in all core information behaviours; as this tends to be the way most humans cope with complex work. Likewise, collaborative information behaviour occurs during the entire information journey within the domains of acquisition, production and dissemination of information. To quote an interview participant, "we worked as a

team in putting together our findings, analysing the data we brought back, and reporting on it back to the individual hospital".

The perceptions of the information workers with regard to the internal impact of information behaviour, as illustrated in figure 5.3, reveal a high degree of positivity in their assessment of how the organisation and its employees will benefit from the various forms of information behaviour that they engage in. This can only be a good thing for the organisation because the information workers value what they do and appreciate how their information interactions and value-added information processes help towards making the organisation a better place.

The following sections use exemplary quotes, otherwise known as significant statements, from the interviews to bring context to the themes that are shown in figure 5.1.

5.4 Perspectives on information

The interview participants comprised 5 males and 5 females with years of experience within the information intensive organisation that ranged from 5 years to 27 years and they were each au fait with the range of information activities that existed in their work areas.

At the start of the interview, the interview participants were asked questions about the function of their work area, their years of experience in working with data and information, their customers and sources of information, and their understanding of the word 'information'. These questions got the interviewees thinking about the specific areas that the researcher was interested in exploring with them and also helped the researcher have a feel for the participants' perceptions of the concepts of interest.

Information is a term which has been described in LIS literature as complex and of many forms. Information was coded as a free node because it was important to understand the interview participants' descriptions of the term 'information' within their context rather than just categorise information which would not have been required for any of the research questions. Huang's (2006) assertion that information is difficult to define can be evidenced in the following responses to the interviewer asking respondents what they understand by information:

"There's the million dollar question that one, isn't it? Information is anything… from my point of view, it's anything that you can take in and process. It can be

from information on how much, you know, how much is in a pint of milk to the most in-depth statistical information" (AL30_T).

"I think information is one of these words which can mean so many different things … information as being any contact you have with people that brings in something that you then have to process and disseminate, that means we are all in the information business really doesn't it" (BQ29_T)

"Information is what we need to, information will mean different things to different people and it will depend on what they want to use that information and data for, is what it is. So it's facts, figures or stimulus. It's anything like that that's going to, that you need to have to do what you want to achieve" (CK28_T).

"I think it's a difficult thing to describe, I think it's different from one person to the other and it depends, just depends on the situation. So for example the concept is, it is arming yourself with the knowledge in a way that could be something to enhance your work" (GO24_T).

As data is handled widely in the study location, some of the respondents offer a description of information as distinct from data. They support Hjørland's (2002) notion of information existing universally but subjectively construed by humans, the operational definition of information in section 1.3.1 as communicated messages that convey meaning, and Bouthillier and Shearer's (2003) description of information as comprising data with context and meaning. The meaning and contextual nature of information are evidenced by the following significant statements from the interviews:

"I suppose there's always this issue about the difference between data and information. I suppose information to me implies not just raw numbers and data, it's how you make a meaning to the data and information is there, I suppose, predominantly to answer questions" (DN27_T).

"We talk about data standards and I think the difference between a data standard and information is that information has context" (FE25_T).

"To me information has to have context otherwise it's just data" (FE25_T).

"Well, information. To me it means more than data. Data is facts and figures, usually tabulated in some way or another, and information is when you look at it,

you analyse it, you interpret it, and the information refers to both the raw data, the facts, and also interpretations on how you can be thinking about it" (KJ21_T).

"I guess to me information is, sort of, data or data that's collected, sort of, in all walks of life that can be used to inform, you know, and help make decisions, or help sort of ascertain, you know, what levels we're maybe at, and if we need to sort of improve things or make changes, etc." (EK26_T).

"My interpretation of "information" is that it is data that's had something done to it to make is useful. Raw data might be a text file of dates and times and events but until that data has been assembled into a form where you can extract some useful knowledge from it, it remains data and it's only when you can get it into a form where you can interpret stuff from it that it becomes information" (HT23_T).

"Information to me is, in terms of working here, is data or other things that are packaged in a way that should help people to become better at doing the job or whatever data itself. If you just look at numbers without meaning it's not information" (JC22_T).

When asked a question about the principal function of the areas that they work in, it was clear that while some of the participants' information work mainly involved only segments of the information journey rather than the whole journey as follows:

"It's auditing the quality of hospital information held in the Scottish morbidity records" (KJ21_T).

"To collect clinical information from GPs and practice nurses in a sample of practices across Scotland. So primarily collecting activity and morbidity base information" (EK26_T).

Some others felt their principal work function covered the entire information journey through the organisation as follows:

"Most of what I do is about information and taking data, turning it into information, reporting and hopefully providing the intelligence that other people need to make decisions or to inform future development" (HT23_T).

"Our principal function is liaising with Health Boards to ensure that they submit data, check for accuracy and completeness, report back to them on any issues we

notice; and when the data is of acceptable quality, we analyse and publish quarterly" (JC22_T)

The information workers were deeply engaged in interacting with information in the course of their work and their descriptions of their information interactions revealed a sense of passion about, and connection with, information and what it meant to their professional lives. The following significant statements of some of the respondents are extracts of responses when asked what role information plays in their professional life:

"It's the core of what I do. It's providing and receiving information" (AL30_T).

"A big role, it's a significant thing because my role is involved, it relates to collecting information or data. Primarily for other people to use but the main focus of the work that I do is to collect that information for other people" (CK28_T).

"I think it's pivotal to my professional life, it's very important to how my day to day work and what I'm quite passionate about is how information is not just used to meet targets but how it's actually used to benefit people like patients or people, individuals" (DN27_T).

"My professional life, we live and breathe information here" (JC22_T)

"Not a day goes by when I'm not doing something with it" (JC22_T)

"It's what I work with all the time. The various tools I use are merely ways of handling it … It's just what I'm surrounded by the whole time" (KJ21_T).

In response to a question about the customers that information workers (interview respondents) interacted with, the top 4 customers whose needs initiated their information behaviours were healthcare providers, the Scottish Government, internal colleagues and the public as shown in figure 5.4.

Figure 5.4 below shows the customer subtypes captured during the interviews and the number of interview participants who revealed the customer subtypes together with the number of times they made reference to the customer subtypes during interview.
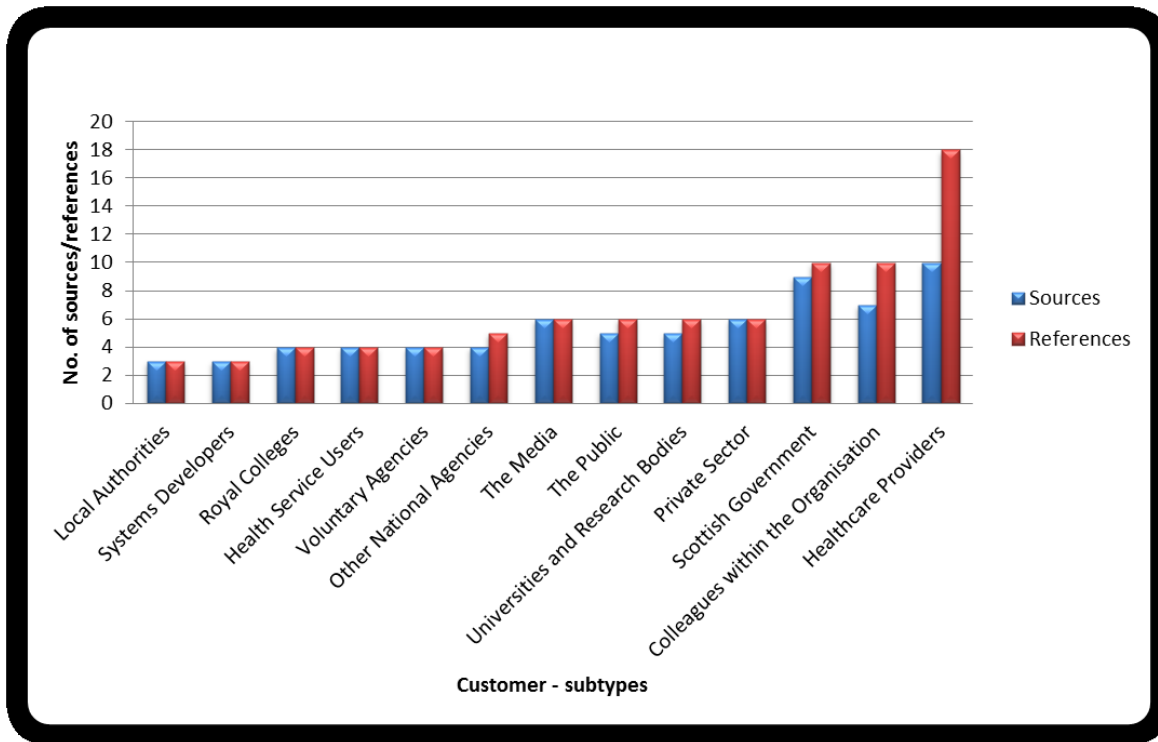
Figure 5.4 Customers of information

In Figure 5.4, the x-axis shows the types of customers whose needs the information workers aimed to meet. The y-axis shows the number of interview respondents who indicated the type of the customer they engaged with (left hand side blue column labelled 'sources') and the number of times the respondent mentioned a type of customer in response to the question (right hand side red column labelled 'references'). Although all 10 interview participants mentioned healthcare providers as being their customers, there were 18 instances of reference to types of healthcare providers in response to the question. On the opposite end of the x-axis, it is shown that 3 interview participants mentioned types of universities and research bodies as being their customers and there were, in total, 3 mentions of types of universities and research bodies as customers. Therefore, it was clear that healthcare providers, the Scottish Government and internal colleagues had the most influence on initiating information workers' information behaviours. Figure 5.4 also shows that there are 2 types of customers:

- Internal customers - comprising 'colleagues within the organisation' and
- External customers - comprising the rest of the customers in figure 5.4.

When the interview respondents were asked to describe their sources of information in the course of their work, the top 4 sources of information were their colleagues within the organisation, documents and reference material, electronic databases and healthcare providers. This is shown in figure 5.5 below.
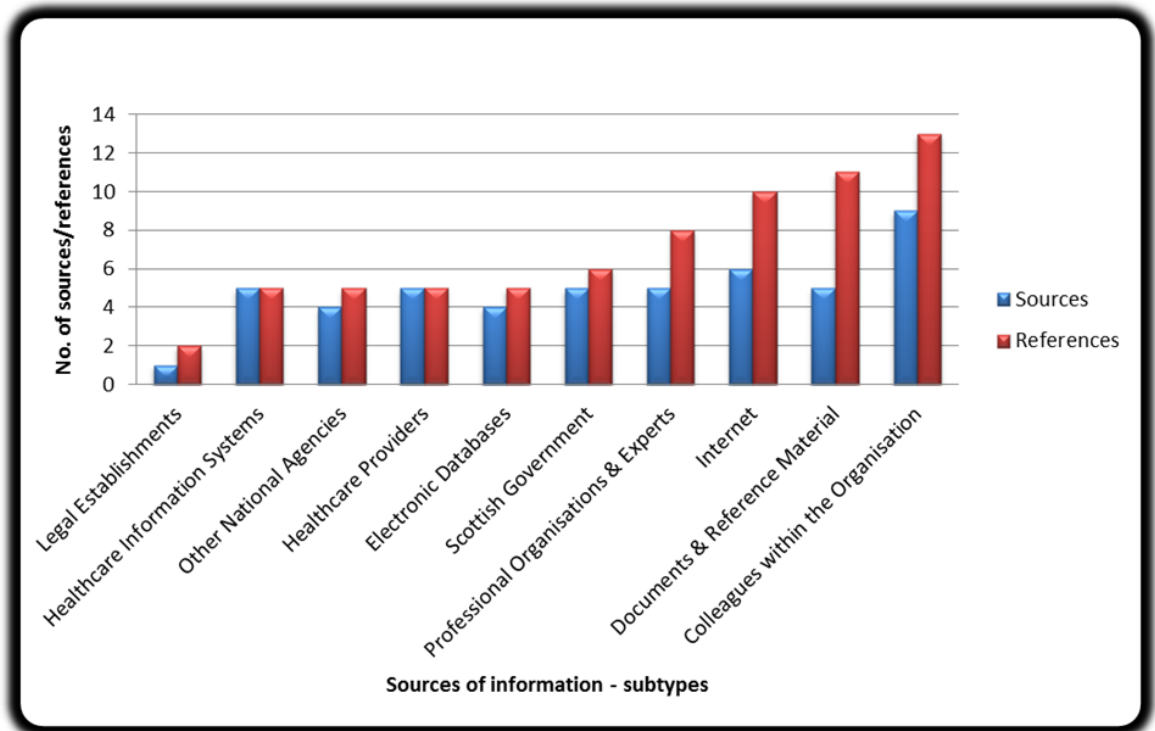
Figure 5.5 Sources of information

In figure 5.5, the x-axis shows the various sources of information for the information workers that emerged during the interview. The y-axis shows the number of interview respondents who indicated the source of information they consulted (left hand side blue column labelled 'sources') and the number of times the respondent mentioned a source of information in response to the question (right hand side red column labelled 'references'). While 9 interview participants mentioned their colleagues within their organisation as sources of information and 5 interview participants mentioned documents and reference material as sources of information, there were 13 and 11 references respectively to sources of information as colleagues within the organisation and documents and reference material. These findings indicate the major influence of people as sources of information when information workers engage in information behaviours. It probably wasn't surprising that only 1 source mentioned that legal establishments were sources of information as shown in figure 5.5. This was because only one small group of information workers, and therefore one interviewee, was involved in work that was related to legal matters.

As explained in chapter 2, Jogaratnam and Law (2006) categorised sources of information as internal and external with either of them being personal (e.g. colleagues) and impersonal (e.g. internet). However, with the term 'impersonal' having synonyms such as cold, distant and unfriendly, it was decided that a better way of categorising sources of information, as identified in the present study and illustrated in figure 5.5, is extended and adapted from Byström (2002) and Grieves (1998) as follows:

- People as information sources. Can be internal or external. Includes colleagues within the organisation, professional organisations and experts, Scottish Government, healthcare providers, other national agencies, and legal establishments
- Physical documentary sources. Can be internal or external. Includes documents and reference materials
- Electronic sources. Can be internal or external. Includes documents and reference materials, internet, electronic databases, and healthcare information systems.

With customers of information and sources of information having been described and interpreted in this section, the following sections 5.5 to 5.11 present the other 7 major themes that were illustrated in figure 5.1.

5.5 Information acquisition behaviour

As shown in figure 5.1 and explained in section 5.2, the term 'information acquisition behaviour' was adopted when extracts of the transcripts were coded and categorised into the following information activities: consulting, searching, retrieving, figuring out, browsing, clarifying, encountering, emailing, skimming, reading, capturing, telephoning, scanning, and delegating. These information activities were interpreted as contributing to the acquisition of information in order to meet the needs of customers and went well beyond just seeking information which is commonly used in LIS literature.

Extracts of texts that support and justify the use of the terms that constitute the information activities of information acquisition behaviour are presented in the sub-sections that follow. The numbers of interview participants (sources) who mention each of the sub-themes during interview together with the total number of references (references) to the sub-themes during interview are shown in figure 5.6 below.
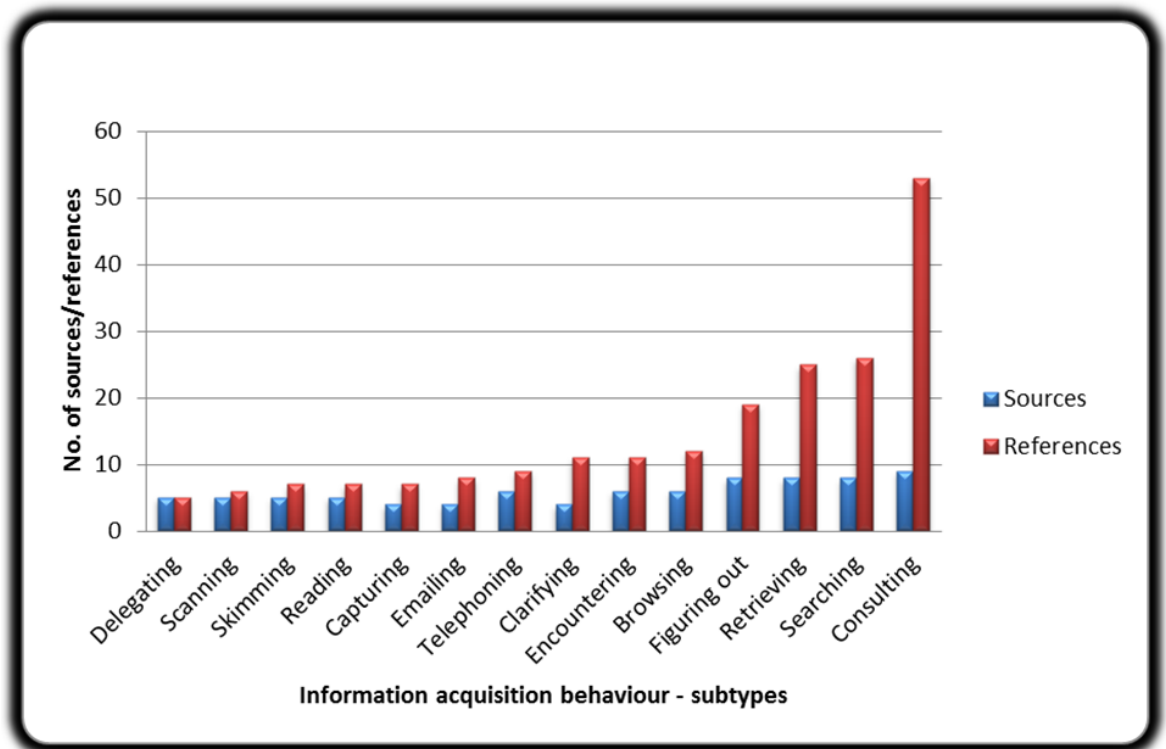
Figure 5.6 NVivo output: Sub-themes of information acquisition behaviour

In Figure 5.6, consulting as a sub-theme of information acquisition behaviour was mentioned the most frequently by a total of 9 interview participants compared to delegating which was mentioned the least frequently and by a total of 5 interview participants.

The theme is referred to as information acquisition behaviour because it extends beyond just "looking for information" (Ikoja-Odongo and Ocholla 2004, p. 58). It comprises information seeking behaviour, information finding behaviour and information retrieving behaviour. This was evident in the interview participants' accounts of their experiences. Therefore, the researcher's personal and LIS theoretical knowledge together with the participants' constructions of their experiences resulted in a decision being made not to adopt the term information seeking for this entire theme which is commonly used in LIS literature, but rather a more appropriate and broader theme, information acquisition behaviour. The interpretation of the theme is shown in the hierarchical structure in figure 5.7.
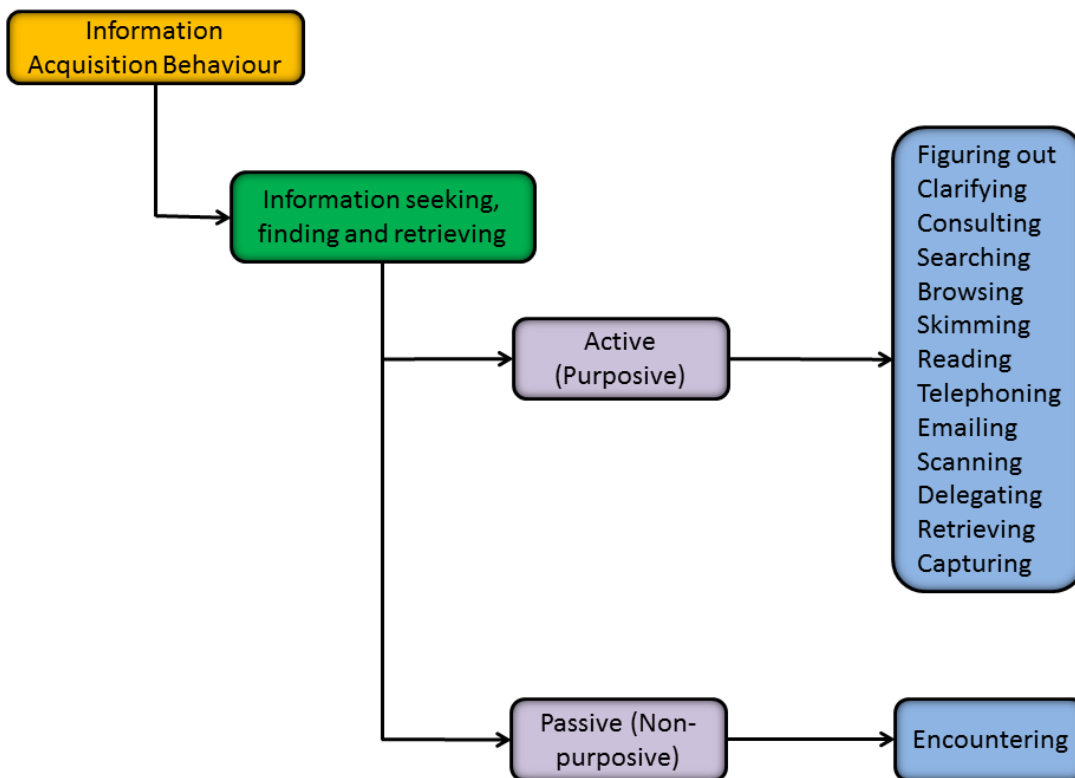
Figure 5.7 Information acquisition behaviour and its subtypes

In figure 5.7, information seeking, finding and retrieving subtypes of information acquisition behaviour are presented. Seeking, finding and retrieving are intertwined and therefore do not exist in isolation. They can be active (or purposive) and passive (or non-purposive) as shown in figure 5.7. Active (or purposive) information seeking, finding and retrieval comprise the 13 low-level information behaviours as shown in figure 5.7. Passive (or non-purposive) information seeking, finding and retrieving comprises one low-level information behaviour called information encountering as also shown in figure 5.7.

To make sense of these terminologies, it is necessary to present their definitions:

- Information acquisition behaviour is a type of information behaviour and refers to hierarchical cluster of information activities involved in getting information in response to an information need. These information activities include seeking, finding and retrieving information. Information acquisition behaviour is a term that has been used by a number of authors including Jacoby, Szybillo and Busato-Schach (1977), Payne and Braunstein (1978), Cole (1998), Schulte-Mecklenbeck,

Murphy and Hutzler (2011) and Miettinen (2012). Erdelez (2005) also agrees that information seeking is a subtype of information acquisition.

- Information seeking behaviour is a subtype of information acquisition behaviour that includes the proactive and passive communicative process of gathering information from one's environment, typically for the purposes of uncertainty reduction (adapted from Tidwell and Sias 2005, Pálsdóttir 2003 and Williamson 1997).

- Information finding behaviour refers to the behaviours involved in the move from information need to actual information as the sources of information are being utilised (adapted from Jones 2007). Jones (2007) explains that the term 'finding' denotes an action that is brought to a close as opposed to 'seeking' which as an open-ended connotation. Finding and seeking are nevertheless closely linked. Information finding has also been used by Spink (2010) in describing information behaviour sub-processes, by Teevan, Capra and Pérez-Quiñones (2007) in explaining how people find information, by Kalbach (2011) who uses it interchangeably with information seeking behaviour and by Chaudhry and Al-Sagheer (2011) in describing the information finding activities of journalists.

- Information retrieving behaviour refers to the behaviours involved in selecting or collecting data or information from an information or document system. The behaviours are closely linked to information finding behaviour. Jones (2004) argues that a significant part of retrieving information is also about finding information and Belkin (1993) argues that information retrieval is information seeking behaviour; hence the justification of the interlink between information seeking, finding and retrieval behaviours.

We now move on to the low-level behaviours that comprise information seeking, finding and retrieving.

5.5.1 Consulting

Consulting with others was a very popular information activity of each of the interview participants and their team members. There was a desire to ensure that the outputs, in response to the information needs of the customers, were accurate and to a very high standard. Therefore, in acquiring all the information necessary for responding to the needs of the customers, interview participants consulted with others such as specialists or people who may have something to contribute in order to enhance the value of the acquired information. Consulting was seen to be just a part of the process of acquiring good quality information or data and it is a term which has also been used by Meho and Tibbo (2003).

The following are excerpts from interviews as evidence of consulting with others within the same organisation:

"Face to face meetings with particular individuals that were keen to assist, round robin sort of emails, telephone conversations with people" (AL30_T).

"I didn't go away and look up any books. I did consult with quite a lot of colleagues mostly by electronic means because I was on a train" (BQ29_T).

"So we seek advice on what's the best way to present it on the website and then what the best format is" (FE25_T).

"So I bounced off one of my colleagues to say 'Look, if you'd been asked this, and I gave you this information, do you think that would answer your query?' She came back and said 'Yes, but you'd need to add a few extra facts to it" (KJ21_T).

However, consulting with external stakeholders and contacts was very common practice. It appeared to be very important for maintaining those good relationships with external contacts in order to secure confidence in what was being collected. The following interview excerpts illustrate this point:

"I've sent it for consultation to a few people to see whether they think there are aspects that are missing and I've had most of these responses back indicating that they didn't think so and that is reasonably on the right tracks but that its always wise to keep consulting with people. You need to have shared ownership of these ideas otherwise they will never go forward" (BQ29_T).

"We have relevant contacts at the Board; so we'd go and ask them, so we can relay the query round to them" (AL30_T).

"Often you will not find what you're looking for, and you may have to consult a desk operator, a practice manager, a nurse, for example" (EK26_T).

"We also then had to check with the practice manager to make sure there wasn't anything that we had missed" (EK26_T).

"We then get feedback on our data standards - so that's the consultation kind of phase. At that stage if people come back to us with feedback we take that on board" (GO24_T).

"I did ask people that had been involved in the past" (JC22_T).

"I also consulted with the Boards to see, to tell them I was creating this report and I had the two purposes, one for me and one for them and what would they like to see in that report" (JC22_T).

"It was really confirmation of codes to make sure that I was selecting information from the right records to pull together my figures. That's why I consulted them" (KJ21_T).

When engaging in consulting information behaviours, there was no need for the information workers to follow any set procedures because each information task determined how partners, colleagues and customers would be consulted. There was therefore a high degree of flexibility when engaging in consulting behaviours.

5.5.2 Searching

Searching behaviours were the second most commonly referred to behaviour within the information acquisition domain. The definition of information searching behaviour is adapted from Wilson's (2000) definition as the "micro-level of behaviour employed by the searcher" (p.49) in interacting with information or document systems of all kinds. In LIS literature, searching has been used widely by researchers such as Wilson (2000), Foster (2004) and Stokes and Urquhart (2011).

Evidence of the interactions between the information workers and information systems is captured in the following extracts of interview data:

"If somebody comes to me and says 'Can you find me a copy of the Data Protection Act,' we just go to the website" (AL30_T).

"I found that a very frustrating exercise and I found that what I did was an incomplete literature search and if I'd had access to a lot of other databases then I would've done a more thorough literature search" (DN27_T).

"You then are looking for key words. You're then looking to try and find key words that would highlight the activity that's being performed, or a diagnosis, and often

they highlight that with an A or a D, you know, there's symbols there that are used, so that allows you to quickly identify what you're looking for, as well as looking at dates, etc., as well" (EK26_T).

"So we did a pretty comprehensive literature research into see how other countries had approached this problem and whether anyone had taken a similar approach to the one we were planning to do" (HT23_T).

The Google search engine proved to be a popular medium that the information workers used for engaging in the search process:

"But I knew that, I thought I knew the name of the system so I'd searched on that first to try and find the company and then the product and then take that product, dump that into Google" (FE25_T).

"I started basically, as I say, just on the Internet and the Google search by typing in areas and terms, like, to see what came back and then it was just a matter of printing information off and looking at what studies had been referenced and following those up" (DN27_T).

"Predominantly we would use search engines like Google to come up with British sites that were looking at allergies for example; then we would use, I suppose, some of the databases as well" (G)24_T).

"I've been trying to find, I had three systems I wanted to speak to someone about and so I Googled it obviously to try and find out any names associated with this particular product" (FE25_T).

"We used Google and we used some other search engines like PubMed to look specifically for medical journals" (HT23_T).

"I must admit I did do some searching using Google and places like Wikipedia to see exactly what the condition meant, or what the background to it was, how it could be differently interpreted" (KJ21_T).

However, searching was not only confined to using electronic information systems. Searching through structured physical documents (or manual information systems) was also an information activity.

"That involves going through case notes, it involves going through capture sheets, it involves searching through clinician diaries" (EK26_T).

Searching information behaviour was therefore a broad term that included both an organised approach that was structured and one that was self-developed as the information worker progressed through their information tasks.

5.5.3 Retrieving

Retrieving is a form of purposive information seeking behaviour that involves selecting metadata, data or information from a structured system using defined queries either individually or collaboratively (adapted from Belkin 1993). Retrieving has also been used in the literature by authors such as Spink and Sollenberger (2004) and Fidel et al (2004).

Examples of retrieving behaviours by information workers as they engage with electronic systems are shown in the following interview text extracts:

"The database is a relational database and it's stored in an area what we call SMRA which is where the, it's a SQL server. We use SQL Plus to interrogate the files in there, the Oracle files that are in there and that enables us to get the information out" (CK28_T).

"We also then had to actually check what was known as their electronic DocMan system, just to see if there was anything we could retrieve from it as well" (EK26_T).

"We pulled all the information in from the actual systems from various health boards" (EK26_T).

"So it was very easy for me to retrieve the data in a way that meant that I could report on the data that had been input very easily" (HT23_T).

The retrieving behaviour was found to be organised with some thought going into the process before engaging in the information behaviour.

5.5.4 Figuring out

Figuring out has a cognitive dimension to it and is subsumed within the sensemaking literature where sensemaking is described as "picture building", to get a "clearer picture", and to "get ideas" (Savolainen 2009, p. 190). Dervin 1983, Weick 1995 and Foster 2004

have also each described sensemaking in such a way as to capture the essence of 'figuring out'. With the interpretation of findings suggesting that 'figuring out' is similar to 'picture building', it is worth noting that Foster (2004, p. 234) defined 'picture building' as "a composite set of behaviors that participants described as mapping out in their minds, and on paper, the disciplines and concepts relevant to achieving an interdisciplinary overview of the topic" thus implying that figuring out does not limit itself to mental processes. The cognitive dimension is also evident in a definition of sensemaking as "behaviour, both internal (i.e. cognitive) and external (i.e. procedural) which allows the individual to construct and design his/her movement through time-space" Dervin's (1983, p. 2).

The processes of deciding on a line of approach, what to do next and how to solve the problem, captured within the information activity of figuring out, are evidenced in the following interview text extracts in which the thinking activity helps the information worker process in their mind before acting:

"I had problems obviously in trying to describe to them exactly the sorts of information I was wanting to be in the set… the sort of things I had spent a lot of time thinking about" (AL30_T).

"We spent quite a while thinking about 'what are the fixed points here and what assumptions might we need to build into this sort of broad line" (BQ29_T).

"My value add is in making sure that I think of, and then suggest, ways that things slot together well" (BQ29_T).

"We agreed to help them. It was a long time for us to do it so we thought there must be an easier way of doing this. So we spent lots of time thinking about the process we'd need to embark on such as comparing data items and things like that" (FE25_T)

"That information is very often jumbled. So we had to ask ourselves a lot of things and figure out what to do" (GO24_T).

"When we think of medication, for example, we think of all of these different things - anything from the batch number of the medication taken to the type of medication it was - we put all of that onto a mind map in order to decide how next to proceed" (GO24_T).

"I was looking at the whole project from inception to final reports and the only way I could deal with that personally was not to think about while we were kicking the project off, not to think about the final reports but to think about the next goal in the process" (HT23_T).

"So I was thinking about doing this, thinking about why I needed it, what I perceived the contacts out in the boards would need" (JC22_T).

"I had to spend time thinking - 'Now, what is it I could show? Would this meet the requirements of the researcher asking for it?'" (KJ21_T)

Figuring out was therefore a major part of the information acquisition process where the cognitive behaviours were evident that helped the information workers make sense of the information problem or how to approach the information problem. It was not necessarily a solitary activity as there was evidence of group thinking where the relevant actors would think about the approaches and modify their thinking based on the sharing of their ideas.

5.5.5 Browsing

Browsing denotes "informal or unplanned search behaviours" (Case 2007, p. 89). It can also be described as "semi-directed searching in an area of potential interest" (Ellis, 1989, p. 179) and is common in information seeking behaviour literature such as the works of Ellis (1989), Ellis, Cox and Hall (1993), Erdelez 1999, Huang and White 2010, Bates 2002, Qui (1993), Chang and Rice (1993).

The browsing behaviours are evidenced in the following interview extracts:

"I tend to browse. I would tend to… I mean, even if I was looking for something, a specific piece of information, I would Google, God bless it, it's a wonderful application. For me, I don't want to focus myself down a very narrow path. I like to keep a fairly broad focus, and I like to be able to say 'Oh, that's quite interesting, and that relates' and tie in other things'" (AL30_T).

"It was a bit of a, it was a very random approach of searching in Google and browsing" (DN27_T).

"Also checking their website, as well as speaking to one particular developer. We were looking to see what new indicators were being incorporated by looking through their website" (EK26_T).

"A little bit of both browsing and searching" (GO24_T).

At times we would all browse because browsing would flag up 'oh we haven't thought of this' or 'we haven't thought of that' (GO24_T).

I have been browsing when I was looking at for information on the technique that we were using (HT23_T).

It was evident that browsing behaviours were embarked upon because the information workers believed that they would find something of use to them without necessarily knowing what it would be. It involved a lot of overlap with the searching behaviours which were more structured. For example, in embarking on a searching activity, the information worker would drift into the browsing mode and, likewise, during browsing, the information worker would then find something of interest which would then trigger searching information behaviour.

Also, as shown in the excerpts above, some information workers who engaged in browsing behaviours gathered bits of information to one side that were later revisited and put together by engaging in other types of information behaviours such as searching. Bates (1989) referred to this collection of bits of information as berrypicking.

5.5.6 Clarifying

Clarifying is a continuation of the sensemaking process that follows or precedes figuring out behaviour. The behaviour is displayed when it is necessary for the information worker to engage in gap-bridging as explained in sensemaking theory in Dervin (1983) and Savolainen (2009).

Examples of significant statements within the interview texts that illustrate clarifying behaviour are as follows:

"I also asked [name redacted] in IT just to clarify certain points about the process and then just to see what was available and what was not" (JC22_T)

"So I got back to the researcher asking for it and said "Is it worth going forward and doing this based on what you've told me?'" (KJ21_T)

"Often you have to get clarification from the person asking the question as to exactly what it is they're looking for" (KJ21_T).

"It was actually conversing with each of the contacts that were out there and trying to develop an understanding of what they were wanting and what they actually used the information for" (JC22_T).

"It became apparent that our interpretation was not that of the people who were inputting the data and therefore we had to make it very clear what we wanted" (HT23_T).

It was therefore evident that the clarifying behaviours did not exist independently and there was constant switching into the other information acquisition behaviours in order to understand an information problem and thereby acquire the information necessary for dealing with the information problem.

5.5.7 Encountering

Information encountering behaviour is discussed in chapter 2, section 2.4.1.1. It is defined as an "instance of accidental discovery of information during an active search for some other information" (Erdelez 2005, p. 180). Toms (2000) uses the terms 'chance encounters' and 'serendipitous information retrieval' to refer to Erdelez's (2005) information encountering.

The value of information encountering behaviour in enabling the information worker to use information for the benefit of meeting information needs is evident in the following significant statements:

"You can go through it and you may just accidentally find other things that are maybe pertinent to what the request has been" (AL30_T).

"You will inadvertently come across things which may have not been mentioned in the summary but are clearly relevant in terms of the coding of that particular episode" (CK28_T).

"You do end up finding things which maybe aren't relevant to your, that specific piece of work. It would be relevant for other aspects of my work and I did actually find out quite a lot that was useful indirectly" (DN27_T).

"You do sometimes come across things that are associated with what you're looking for and that can be, "Oh, I'll keep that in the back pocket." Write it down and, you know, see if it's relevant" (FE25_T).

"But at times everyone would browse because browsing would flag up 'oh we haven't thought of this' or 'we haven't thought of that'" (GO24_T).

"We do stumble across things and say "bingo, yeah that was exactly what I was looking for", but sometimes it can be a day or two into the browsing process unfortunately. You think, gosh, if only I'd stumbled on that two days previous it would be a lot more helpful" (GO24_T).

"In browsing, I strayed into areas of operational research where I found stuff that wasn't directly relevant but still informative and useful" (HT23_T).

The information workers would embark on information behaviours with the knowledge that they will encounter information which would be of use to them. That is, they realised that there were unknown items of information out there which they would become known to them as they engage in other information behaviours. Sometimes, the information workers would revisit encountered information which was not immediately useful to them at the point of encountering but subsequently because useful as they engaged in other forms of information behaviour.

5.5.8 Emailing

Emailing is described in Rioux (2005) as a means of acquiring information and there was evidence of this in the interview texts. However, it can also be used a means of disseminating information and is examined later on in this chapter within the context of transmitting information.

Engaging in emailing behaviours to acquire information is demonstrated by the following extracts of interview texts:

"It was via email actually but I think that was an imperfect way [of obtaining others' views] but they wanted a quick answer and we didn't have time for our diaries to mesh up" (BQ29_T).

"I was successful in getting information from NHS24 who actually supplied us with information because I had a key contact that I'd got within ISD and I emailed that key contact who then emailed onto their information people and within a very short time I was given what I was asked for" (DN27_T).

"It was just done via email" (DN27_T).

"I mean, if I'm looking for something I'll spend the time until I find the information and then I'll keep that information up and sometimes you look at another window just to make sure you've got all the information you've got available to you and then phone the person or compose an email" (FE25_T).

Emailing was perceived by the information workers to be a quick method of acquiring information. Like other acquisition behaviours there was considerable interaction with the other forms of acquiring information. The email network between ISD and its mail customers – that is, the Scottish Government, NHS Boards and colleagues within the organisation – was an approved secure way of corresponding and so it was used as a proxy to making telephone calls or meeting face-to-face.

5.5.9 Skimming

Skimming, or skim reading behaviour, takes place when information workers view a few electronic or physical pages quickly in order to acquire main ideas, key terms or an opinion of relevancy that the information worker is interested in. Rowlands et al (2008) refer to this activity as a form of horizontal information seeking. Skimming is different from reading in areas such as eye movement and attention (Rayner 1998) which are not within the scope of the present study. Skimming is assumed to have been experienced when the interview participant describes an experience of skimming which is also interpreted as skimming.

Evidence of skimming by the information workers is within the following excerpts:

"I would probably skim through and look for something that... a common interest that was in, you know, particularly interesting or particularly relevant to my field" (AL30_T).

"You will then look at clinical notes and skim the clinical notes to see if there's anything else in there that's of value … but you're generally skimming, you're not really looking for detailed things" (CK28_T).

"You are initially skimming the records to look for appropriate documents" (EK26_T).

"You skim down the reading matter presented to you and perhaps choose ones where you know you like their style of description, or where you know it's easy to follow" (KJ21_T).

During skimming, there was a sense of urgency because there wasn't enough time to reading and grasp the full meaning of what was being read. This was particularly so when there was a lot of material to go through and the information worker therefore used metal key words or phrases to determine what was important.

5.5.10 Reading (for meaning)

Reading behaviour takes place when information is being viewed by the individual more slowly and with greater attention and concentration than skimming. Reading is therefore more in-depth. In-depth reading, or reading for meaning, allows an individual to construct a sufficiently coherent picture (Savolainen 2009, p. 197) and thereby make meaning from the information that is being read. Todd (1999) added that, during the reading activity, which is a subtype of information seeking behaviour, the knowledge structure of the individual is changing and therefore supports Brooke's Equation which was discussed in chapter 2, section 2.4.1.5.

Evidence of reading for meaning behaviour by information workers is inherent in the following significant statements:

"Again it was very easy to get the information and it involved a lot of reading to gather the information" (DN27_T).

"So there was a lot of wasted time in terms of reading stuff that wasn't relevant but it had to be read to establish that" (HT23_T).

"So I do make a point of scheduling a wee bit of time every day to go through the media monitoring and reading the articles of interest" (JC22_T).

"You always have to look at one record at a time, reading each one carefully" (EK26_T).

When reading for meaning, there is more curiosity than skimming and the information workers bring their knowledge and experiences into the process in order to interpret what they are going through and therefore make meaning from what is being read. Reading for meaning is a key concept in information literacy or informed learning (Bruce 2008) where the individual engages with the information in such a way that he or she grasps what is being conveyed and learns from the meanings of the texts. However, the research questions in the present study did not require a further examination into the levels of information literacy of the information workers.

5.5.11 Capturing

Capturing behaviour is extracting and saving relevant information that the individual is interested in (adapted from Erdelez 2004, Cunningham 2005, and Makri and Warwick 2010). In the research location, as part of the processes involved in acquiring information, arrangements are in place for regular information, that meet the requirements of the information provider, to be sent to the provider by electronic means. These arrangements therefore negate the requirement to engage in "hunting" (Erdelez 1999, p. 25) for information because the information is received, extracted and saved.

The relevancy and usefulness of the captured information are demonstrated in the following interview text extracts:

"They have to retrospectively give us data and give us numbers, again, depending on what it is. With actual physical records and accuracy, we have to do a visit because it's our judgement" (EK26_T).

"So we had to develop a system, a process, that the customer could provide us with information which was useful to us" (FE25_T)

"We did it by setting up a web-based system that the health professionals out in the Boards all over Scotland were able to access the website and input in data we required to that website (HT23_T).

"The information was captured. I and one other person created a mock-up of a form that we wanted to have the data input from. I built a demonstration database to show how the data should go from the form into the database and how it should be stored and our colleagues in IT were able to take that model and build a web based data entry form and a storage facility" (HT23_T).

"The Boards are able to submit the required information which is processed automatically" (JC22_T).

The capturing information behaviour therefore involved a number of sub-processes in creating the right physical or electronic environment for receiving relevant information as part of the information acquisition process.

5.5.12 Telephoning

Telephoning behaviour comprises the "human communicative and social processes involved in information acquiring and sharing" (Rioux 2005, p. 171). These communicative processes are demonstrated in the following interview text extracts:

"Also I use electronic means and the telephone whenever I am out and about" (BQ29_T).

"I contact them by email or phone" (FE25_T).

"Yes, yes there was quite a considerable iterative process of the form gradually developing. Lots of to-ing and fro-ing. Several phone calls to people we knew in the Boards" (HT23_T).

"I was never off the telephone - trying to make sure I got as much information as possible from my contacts" (JC22_T).

"I also phoned a colleague upstairs to see whether she had any information to add to what I had extracted" (KJ21_T).

"I did this by phoning them and following that with another couple of phone calls just to make sure I had all the necessary information before me" (KJ21_T).

Telephoning behaviours were used to supplement other information activities in order to get all the information necessary to make a decision or progress to the next stage. This is evidenced in the following excerpts:

"I'll keep that information up and sometimes you look at another window just to make sure you've got all the information you've got available to you and then phone the person or compose an email. I can cut and paste into the email sort of stuff or drag information from it" (FE25_T).

"So I could be filling out the spread sheet, and be on the net to find the information and do the email to the person or phoning the person I want to speak to".

"We not only depended on the internet. I did lots of phoning around to people who are knowledgeable in this area so that we could add to what we found online" (GO24_T).

5.5.13 Scanning

Scanning behaviour is tracking, and acquiring information from, particular sources that may be of benefit to the needs of the recipient of the information. Auster and Choo (1994) explain the scanning can involve searching, viewing, being exposed to, and observing information. Jogaratnam and Law (2006) add that environment scanning in the tourism industry is an information acquisition practice. Other authors such as Ellis and Haugan (1997), Ellis (1989) and Meho and Tibbo (2003) have used the term 'monitoring' with a similar meaning to that of scanning behaviour. However, it was decided to use the term scanning rather than monitoring in the context of the present study so as to avoid confusion because 'data monitoring' is a particular information work role in the study location that involves checking the completeness statistics of data that is received routinely by the organisation.

Scanning behaviour by information workers is evidenced by the following extracts of interview texts:

"I have a number of resources I can use. I can either look at the latest newsletters that come out. I sign up for several newsletters on information governance and I get... they are mainly provided by law firms, but they're very good, provide a good overview of the latest decisions. So I can either go to them, I can go to something like the BBC news site, which quite often has things if you think of anything on lost records. They're actually quite a good source of information, the BBC, and the papers, obviously. Or I could go to the Information Commissioner's office, I could go to Scottish Government. So for me, I can spend half an hour and go and keep an update on what the latest developments are" (AL30_T).

"It involves keeping one's eyes and ears open for media stories; it obviously involves keeping your head close to the ground at least your ear to the ground in what's happening in policy development and what it might be comfortable to share about what's going on there" (BQ29_T).

"These sources allow me very easily to keep an eye on what's going on in information governance generally, without having to expend an awful lot of effort and time" (AL30_T).

"So once we've found out what was within scope we then used the internet quite a large, to a large amount to just find out what other datasets were out there. This

was very important because new datasets came into being all the time so we had to be aware of the most up-to-date information" (GO24_T).

At the same time, I would read the media monitoring news to make sure nothing was happening out there that would have an impact on the type of information I should be looking for (JC22_T).

"I also checked some websites and spoke to colleagues in England to make sure there were no recent changes or forthcoming changes to the codes" (KJ21_T).

From the above excerpts, scanning behaviours encroached into other information acquisition behaviour subtypes such as reading for meaning, browsing, and searching. This proved that scanning behaviours were a complex amalgamation of information activities that resulted in the acquisition of information.

5.5.14 Delegating

Delegating behaviour is assigning an information task to another person. There was evidence that this behaviour occurred during the information acquisition phase but the interviews did not provide evidence that it occurred when once the information had been acquired. Al-Daihani and Oppenheim (2008) refer to this process as using information intermediaries and added that it occurs frequently in legal professionals' information seeking behaviour. Urquhart et al (2007) have also investigated delegation in information searching among clinical teams and Grieves (1998) presented findings of 5 studies that involved information seeking delegating behaviour among the research participants.

Evidence of delegating behaviour is shown in the following significant statements:

"Having broken the work down into chunks, I then delegated some of the tasks for collecting the data to my colleagues so as to ensure sharing of responsibilities" (HT23_T).

"I even asked my colleagues in my team to ask their contacts in Boards for any feedback on what information they would like included in the reports. So others were helping me get a range of views from our stakeholders" (JC22_T).

"If I was swamped with work, I would ask a colleague in my team to handle aspects of the information request by gathering the necessary information that the customer requires. These were opportunities for others to gain experience" (KJ21_T).

There was also evidence that, when once the intermediary has acquired the information, the ensuing information behaviours were of a collaborative nature:

> "I approached [name redacted] … and asked him to find the information so we could write the report that was required" (DN27_T).

5.6 Information production behaviour

The information production behaviour theme comprises the sub-themes of checking, transforming, report writing, securing, comparing, separating, integrating, refining, storing, analysing, interpreting, formatting and manipulating as shown in figure 5.8 below.
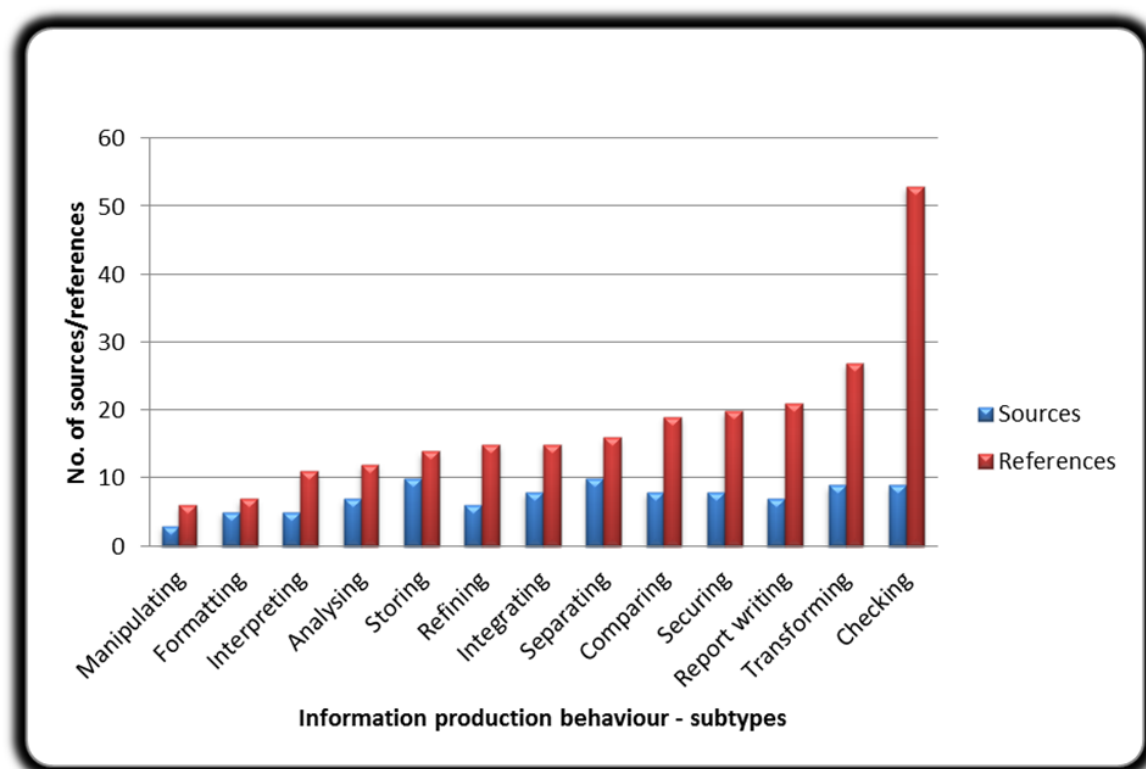
Figure 5.8 Sub-themes (categories) of information production behaviour

In figure 5.8, checking as a sub-theme of information production behaviour was mentioned the most frequently by a total of 9 interview participants compared to manipulating which was mentioned the least frequently and by a total of 3 interview participants. This was not surprising because the nature of the work in the information

provider organisation requires a high degree of accuracy in their information outputs for their customers especially as the major external customers are the Scottish Government and healthcare providers who may formulate health policies and make major healthcare decisions based on the accuracy of ISD's outputs.

The sub-themes indicated in figure 5.8 are organised in a hierarchical way and related to the main theme of information production behaviour as shown in figure 5.9 below. Here, seven behaviours are subtypes of information synthesis which, in turn is a type of information production behaviour. Likewise, six behaviours are subtypes of information organisation behaviour which, in turn, is a type of information production behaviour.
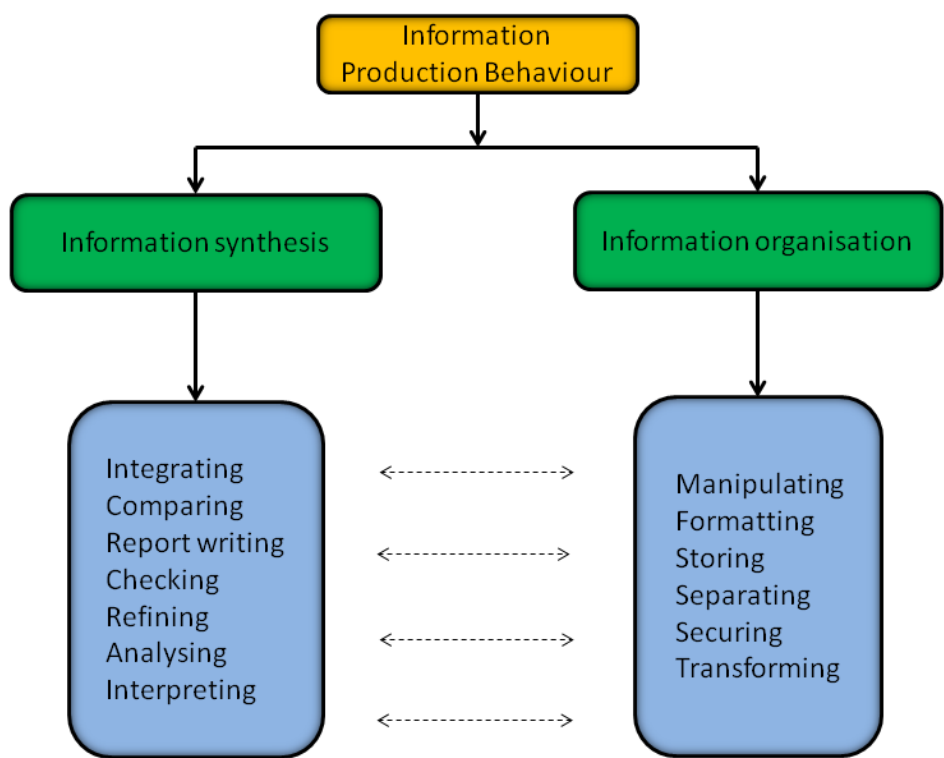
Figure 5.9 Information production behaviour and its subtypes

It is necessary to clarify the definitions of the key concepts in figure 5.9 as follows:

- Information production behaviour refers to the transformation information activities involved in adding value to acquired information while creating a product or service to pass on. The term is borrowed from the discipline of economics, where Sloman, Wride and Garratt (2012) refer to production as the transformation of inputs into outputs in order to satisfy a need. It is also borrowed from management where Cole and Kelly (2011) state that production "deals with

activities involved in creating a product or service [where] a set of inputs is transformed in some way to create outputs valued by the customer (Cole and Kelly 2011, p. 146); a view also supported by Kumar and Suresh (2008) who emphasise the value-added and high quality nature of the outputs in production.

- Information organisation refers to information activities that bring structure to information (Leuski 2001). As shown in figure 5.9, the behaviours identified from the interview texts comprise manipulating, formatting, storing, separating, securing and transforming information, which bring structure to acquired information or data.

- Information synthesis is integrating the relevant pieces of acquired information in a report in order to satisfy an information need (Amigó et al 2004, Blake and Pratt 2006). It may comprise a series of information behaviours related to the application of analytical methods to data, checking of accuracy of outputs, editing, reviewing and amending outputs, and preparing a final information product. As shown in figure 5.9, the information synthesis behaviours as interpreted from the interview texts are integrating, comparing, report writing, checking, refining, analysing and interpreting.

We now move on to the low-level behaviours that comprise information synthesis and information organisation.

5.6.1 Checking

As mentioned earlier, checking behaviour was the most frequently experienced to maintain the integrity of the information outputs. The word checking is of very common parlance within the study location with regards the information workers' day-to-day work. Checking behaviour is engaging in activities that verify that information is accurate and free of errors. Ellis, Cox and Hall (1993), Foster (2004) and Stokes and Urquhart (2011) used the term 'verifying' to refer to the process of checking used in the present study.

The following significant statements from interview texts demonstrate the significance of checking within the information provider organisation under study:

> "The checking process essentially was I sent back each of the typed up templates to whoever it was I had been speaking with to make sure that we hadn't misquoted them at all and they all saw versions of the master template - but anonymised - so it wasn't clear who had made what comment as we went along" (BQ29_T)

"Get somebody to check the syntax of your programme to make sure it's run correctly, selecting things out" (CK28_T).

"Involved in the data, carrying out data quality checks, checking data against case notes where you actually have the information that's been submitted to you, in front of you and you are checking from the medical records back at the hospital what information has been supplied is correct" (CK28_T).

"We'll check by running a series of SQL scripts which will pull out what we have deemed as being under a duplicate record (CK28_T).

"A lot of the quality assurance of the data is done at the point because it's done through an interview process. So any inconsistencies can be found out at that point" (DN27_T).

"You're trying to get through too many records. So it's important that you always have a second check" (EK26_T).

"Someone else will QA what I've done and vice versa" (EK26_T).

"We run it past, we basically take their data item and we check if there's an equivalent on the health and social care data dictionary and if it matches, we've matched" (FE25_T).

"The files come in and we check how many records, how many passed validation, how many failed and percentage of validity" (JC22_T).

"So I had to create a Business Objects report for my benefit to be able to check through for these issues, check for any breaches we might want to follow up or all the figures that were, like, just the total numbers and the list numbers" (JC22_T).

I can get somebody else to check it and make sure that I haven't made any careless mistakes like transposing numbers or picking the wrong information out and placing it in another place (KJ21_T).

And there was a lot of proof reading, of checking … Oh, and in all of this, we always get our results checked by another team member.

Checking was a major part of the information production process. It was evident that checking was either done as a lone activity or a reciprocal activity whereby information workers checked one another's work. This depended on the type of information activity. Checking behaviours also conformed to either formal or informal checking procedures or guidelines. In addition, checking was either done at the end of an information activity or during key stages of the information activity in order to ensure that the end product would have a good degree of accuracy.

5.6.2 Transforming

Transforming behaviour is turning a form of data or information into another form (e.g. data into information, graphs and charts into a report) which result in an increase in understanding and knowledge structures of the individual interacting with the outputs. Todd (2006) used this information behaviour concept to describe how students manipulated and transformed facts, which they had gathered, into personal knowledge and understanding. Crié and Micheaux (2006) also used the transforming concept when discussing the data to value information chain transforming behaviours that take place in organisations; while Spink (2010) argued that the data-to-information transforming activity is an evolutionary instinct.

The following significant statements from the interview texts demonstrate how information transforming behaviour results in useable outputs that make sense and increase understanding:

"You have to take it and do it bit by bit by bit, trying to put it in a process where you can, you know, for example, pivot table or something like that where it's easier to use and a bit more user-friendly" (AL30_T).

"I had written a lot of information into a template and either I or one of my administrative colleagues typed that in and we ended up with a big Spreadsheet with lots of this information which we were able to turn into a document which was used to generate a bit of discussion around the division" (BQ29_T).

"The process of taking 50, 10 page templates and turning that into one 30 or 40 page discussion document required a bit of a process and the process that I invented, from the bits that were obviously used elsewhere, was partly quantitative, we had some graphs, partly qualitative" (BQ29_T).

"The process of taking 50, 10-page templates and turning that into one 30 or 40-page discussion document required a bit of a process and the process that I

invented, from the bits that were obviously used elsewhere, was partly quantitative - we had some graphs, partly qualitative" (EK26_T).

"The data is sent in by the Boards, we then have to translate that into useable information" (JC22_T).

"I pulled out numbers, and then the next stage was to turn them into rates within, in this case, an Excel file … when I'd got the rates that I was interested in, I'd put them in a graph so that you could see the trend" (KJ21_T).

It was evident that that the outputs that emerged from the transforming behaviours were then used by the information worker for the next stage of the information journey.

5.6.3 Report writing

Amigo et al's (2004) description of information synthesis include the bringing together of pieces of information in a report to satisfy a need. As shown in figure 5.8, report writing was the third most frequent information behaviour as described by the interview participants especially because the outputs for the information consumer are usually sent to them in the form of reports. Report writing is therefore the preparation of electronic or physical documents that comprise the information that the information consumer requires.

Evidence of report writing behaviour from the interview texts is shown below:

"I wrote the framework of the outline business case which was based on work that had previously been done" (BQ29_T).

"The data was then stored in an SPSS file and analysed within SPSS and the outputs produced in SPSS and the routine reports prepared using a combination of Microsoft packages" (DN27_T).

"We put that into a final report with a lot of additional text as well" (EK26_T).

"We'll produce a report on the compliance just for the use of the developer as well" (FE25_T).

"Then we will write the report from beginning to end and it will be in consistent terminology all the way through" (KJ21_T).

It was evident that report writing as an information behaviour comprised an individual activity or a group activity where actors came together physically or virtually to prepare a report.

5.6.4 Securing

In ISD, a small group of information workers deal with sensitive health information that must adhere to the rules of information security. Securing behaviour is therefore engaging in activities that ensure that information is managed securely. Meho and Tibbo (2003) use the terms storing and archiving information when modelling the behaviours of social scientists and omit securing information. The reason for this lies in the context of the study which is explained by Stanton et al (2004).   Stanton et al (2004) found, in their study of security practices in organisations, that the work role and the type of organisation are two of a number of factors that necessitate information security behaviours. ISD, in handling sensitive and confidential information, therefore has employees who engage in information securing behaviours.

Extracts of interview texts that illustrate information securing behaviour are as follows:

> "We would write protection it before they're made available; and then they are PDF'd when complete. So obviously they're un-editable from there" (AL30_T).

> "Nobody could access that electronically. So it was kept securely" (BQ29_T).

> "I felt reassured about the security of the information we had secured electronically" (BQ29_T).

> "But we also have to protect stuff so we virtually control their stuff and the doors because we don't want different versions of our stuff going about. So we virtually control it, we don't want people changing it so a lot of them are locked so people can't change stuff that's there" (FE25_T).

> "The information that is keyed in immediately goes onto a secure server" (KJ21_T).

It was evident that securing as an information production behaviour subtype resulted in information workers feeling reassured that the information was out of reach from those who were not authorised to access it. In some cases, the securing behaviour was an automatic by-product of the information activity and, at other times, the information worker set out to engage in the securing behaviour.

5.6.5 Comparing

Bettman, Luce and Payne (1998) argued that, in making decisions while interacting with information, one of the behaviours that people engage in is comparing items of information. This behaviour was experienced by the interview participants as they aimed to achieve their quality of output. It is evidenced in the following significant statements from the interview texts:

> "So we bring the information back and the comparisons takes place with that information" (CK28_T)

> "So we're comparing READ code returned against actual clinical paper trails of information" (EK26_T).

> "… and then compare those texts, read codes, against what was actually returned to ISD. So we're actually, you know, comparing like for like to be able to identify if we have a match, if something was inaccurate, or they may have recorded something a bit more detailed than we actually found" (EK26_T).

> "We've then got a little comparison column where we can say, "Yes, no, it does compare," or an equivalent and there's a number of options there. Then we show them the standard that we think is comparable" (FE25_T).

It was evidenced that comparing behaviours resulted in the removal of inaccurate data and also generated new information that the information worker would use to make decisions in the information production process.

5.6.6 Separating

Filtering and separating were interpreted as having the same meaning. Both Stokes and Urquhart (2011) and Foster (2004) define sifting as selecting and pruning which is exactly what the concept of separating intends to convey. In separating behaviour, items of information are identified and removed.

The following significant statements identify with separating behaviour:

> "I was filtering out the information that was too much. It almost got to the point where we had too much information, and trying to find… these were meant to be

guidance documents, so it was remembering what was key for us, but all the time key for myself was remembering what we were trying to achieve with these" (AL30_T).

"So part of it was being able to filter out that information that people gave us that was personal to their own organisation and just providing that information that was generic to everybody" (AL30_T).

"I was sorting the data by separating what was important from what was not important" (BQ29_T).

"I have to sort of sift out what is useful and then put that into the summary sheets" (JC22_T).

It was evident that separating behaviours contributed to the information having more meaning for the user of the information. This was a useful state to achieve in order to inform the next stage of the information journey.

5.6.7 Integrating

Integrating behaviour is part of the information synthesis (Blake and Pratt 2006) process whereby items of information are brought together in order to increase the value of the information. Foster (2004) uses the term consolidation to mean "judging and integrating" (p.234) information. Stokes and Urquhart (2011) also use consolidation to mean "pause and assemble collected information" (p. 932); whereas Dervin (2003) uses the synonym "grouping" (p. 55).

Examples of integrating behaviour are shown in the following significant statements from interview texts:

"So we were able to collate the information and provide it on a particular template document" (AL30_T)

"So we simply added that information to what we had already collected during a previous visit" (CK28_T)

"All the information that we collect on older people in the various settings we put it all together and it's published on the web in the form of an annual report which we wrote" (DN27_T)

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"I then had to glean the bits of it that I needed and pull them out in the shape I wanted" (KJ21_T).

"So we've been cleaning the data and making sure it all integrates as a total picture" (HT23_T)

Integrating behaviours were the opposite of separating behaviours in that, bringing pieces of information or data together resulted in the information having more meaning for the information worker and would inform the next stage of the information journey.

5.6.8 Refining

Refining behaviour is the process of making changes and revisions to information in order to arrive at a final state. In subsumes synonyms such as editing, revising, modifying, fine-tuning and altering. Foster (2004) also uses the term refining whereas Makri and Warwick (2010) uses the term editing.

Evidence of refining behaviour experienced by interview participants is shown below:

"Who decided what was in and what was out? Well that was me really. I mean, I just thought that some of this was too much detail and I chucked it out. I quite like editing so it's not really a big issue" (BQ29_T).

"They come back and say, "No, it's only new outpatients that we're interested in." Then often we have to change our query to make sure that we're going to be able to just pick up new outpatients" (CK28_T).

"When they come back and say, "This data is inaccurate or we should've recorded this," then we will change the data to reflect what they say is accurate" (DN27_T).

"We also do this information task where we look for information whether it's on the internet or talk to other people outside of ISD and then we then refine that through review periods" (GO24_T).

"We had to change the wording in many respects because it became apparent that our interpretation was not that of the people who were inputting the data and therefore we had to make it very clear what we wanted" (HT23_T).

It was evident that refining behaviours did not occur independently of other information production behaviours such as checking and comparing. The behaviours were initiated either by the individual or by others.

5.6.9 Storing

Storing behaviour is keeping or depositing information for use by self and/or others. Foster (2004) identified storing as one of the processes involved in information behaviour and Meho and Tibbo (2003) used the term archiving and storing for future use.

Information workers engaged in storing behaviours either for later use or to ensure that their colleagues or collaborative partners can have access to the stored information. The following significant statements illustrate this point:

"I stored everything on our network drive" (AL30_T)

"I kept it electronically as the master copies on my shared drive" (BQ29_T).

"The data was then stored in an SPSS file and analysed within SPSS and the outputs produced in SPSS and the routine reports prepared using a combination of Microsoft packages" (DN27_T).

"We would store that onto an electronic Excel database" (EK26_T).

"If we've done a bit of work we'll make notes for our own purposes so if you only use something once you'll forget how to do it so we'll keep the macro, put a couple of wee notes on it just so that if you need it again you can refer to it" (FE25_T).

"We store them all on our shared drive. So say that if there are 4 or 5 people in the cluster that we are working in, everyone then can access that and do it" (GO24_T).

"We set up a system where the data was stored here in ISD and I was able to, I'd had some input to the design of the actual database and the way the data was stored" (HT23_T).

"In all these cases the data will be stored in an area of the network which only people within the team are allowed to access (KJ21_T).

Storing information was an essential process to support the collaborative nature of the work of information workers and to comply with the rules of ownership of the information that rested with the organisation. Storing as a subtype of information production behaviour interacted with other subtypes such as securing which was evident in the interview excerpts.

5.6.10 Analysing

Analysing behaviour, in the context of the present study, refers to the statistical and other quantitative techniques that are applied to data in order to create information for the end-user. Makri and Warwick (2010) cite the Oxford English Dictionary in defining analysing behaviour as "examining in detail the elements or structure of the content found during information seeking" (Makri and Warwick 2010, p. 1749); whereas in the context of the present study, analysing behaviour commences when once the data or information has been acquired.

Analysing behaviour is evidenced in the following significant statements from interview texts:

"When we've got the group together, do a cross-tabulation of what's been recorded on the electronic one against what we feel should have been recorded" (KJ21_T)

"people are going out and are collecting the information, bringing it back, and then I work with them on analysing it" (KJ21_T)

"We used different tools for designing forms for creating a database for analysing the data" (HT23_T).

"We're looking to identify information that can be transferred so we can then analyse it later" (EK26_T)

"The data was then stored in an SPSS file and analysed within SPSS and the outputs produced in SPSS and the routine reports prepared using a combination of Microsoft packages" (DN27_T).

The evidence from the interviews demonstrated that the various forms of analysing involved using statistical techniques within software packages such as SPSS (SPSS 2010).

5.6.11 Interpreting

Interpreting behaviour comprises the activities that complement or replace the analysing behaviour stage in which the information worker provides a professional opinion of the information, thus giving it more meaning and value for the end-user. Interpreting behaviour is also used in Makri and Warwick (2010) but they refer to it as a high-level behaviour comprising many low-level behaviours. In the context of the present study, interpreting behaviour is a specific activity and is commonly used in the language of those information workers who engage in this behaviour to mean what is described in its definition as set out in this section.

Evidence of interpreting behaviour is shown in the following significant statements of interview participants:

"And also we've got a lot of data we can look at over time and it's highlighting which areas where there's been a particular drop or a particular increase in seeing dependency levels in a particular health board" (DN27_T).

"We didn't do enough interpretation of the data, we had to just give them very high level numbers rather than spend more time looking at the data, maybe pulling in other data sources to see how it compared with that" (DN27_T)

"We had to, you know, obviously format it, interpret it, make sure it made clinical sense, and then send that out in a, in a format that met their needs" (EK26_T)

"It was between us and the specialist analyst team, in looking at the actual systems, looking at the coding that they used, interpreting them" (EK26_T)

"So a lot of the work that I do at the moment is taking that information and actually deciphering it into different concepts" (GO24_T).

Interpreting behaviours were made possible by the knowledge and expertise acquired by the information workers. This was particularly important because, while some customers would satisfy themselves with information presented as it is, others would prefer the information provided to be accompanied by commentaries that put it into the context of wider issues; hence interpreting behaviours.

5.6.12 Formatting

Formatting behaviour is engaging in activities that ensure that the outputs are presented in a way acceptable to the end-user while conforming to the standards of the provider. Formatting behaviour was identified in Dervin (2003) as an information use strategy but no definition was provided.

Some significant statements from the interview texts that demonstrate formatting behaviour are as follows:

> "So gathering the information and providing it in a format that is easily available to the users, the people that are wanting to get access to this, and in different formats, as well" (AL30_T).

> "Once we had actually collected all the information and interpreted it, we then formatted it and put it in a final product" (EK26_T).

> "We then format it because a lot comes in a spreadsheet but there's always extra, well extra numbers that are not terribly useful for the information we're trying to share with the health departments" (JC22_T).

> "We had to, you know, obviously format it, interpret it, make sure it made clinical sense" (EK26_T).

It was evident from the excerpts that formatting behaviours, as with the other behaviours, were necessary to contribute to the added value of the information provided to the end-user. They resulted in the information being presented in a way that the end-user was happy with.

5.6.13 Manipulating

In ISD, specific information workers interact with a lot of graphs, charts and tables that require dicing and slicing, transposing, and tweaking of the data. These activities are referred to as manipulating behaviour. Shaaban, Lockley and Elkadi (2001) highlighted manipulating behaviour of architects and described it as when information is reproduced "in a meaningful form, which are often described as designs" (Shaaban, Lockley and Elkadi 2001, p. 43).

Evidence of manipulating behaviour is shown in the following significant statements from interview texts:

"We did manipulate the data and sort of put it into sort of filing categories so that we could almost try and fit it in with what we currently had" (EK26_T).

"I did a bit of manipulation to get it in the shape that I needed it" (KJ21_T).

"We do quite a lot of manipulation of the data, using a variety of different tools, not just business objects, but Excel and SPSS as well, and sometimes Access" (KJ21_T).

"There was quite a lot of manipulation to make sure that a diagram fitted well, sometimes fitting it into one column or the other, sometimes saying 'Well look, it would be best across these columns'" (KJ21_T).

"I created it using Business Objects, so that took, I think, a week or so just trying out different things, different, whether it was better to display it in a table or whether it was better as a graph or a chart or what kind of a breakdown were they wanting, was it just the high level numbers or numbers by specialty?" (JC22_T).

It was evident that manipulating behaviour did not have any negative connotations as does an identical word used in common discourse. The term interacts with other information production subtypes such as formatting where the aim is to ensure that the end-user can make sense of the output.

5.7 Information dissemination behaviour

The information dissemination behaviour theme comprises the sub-themes of presenting formally (and informally), cascading, publishing online and transmitting as shown in figure 5.10 below.
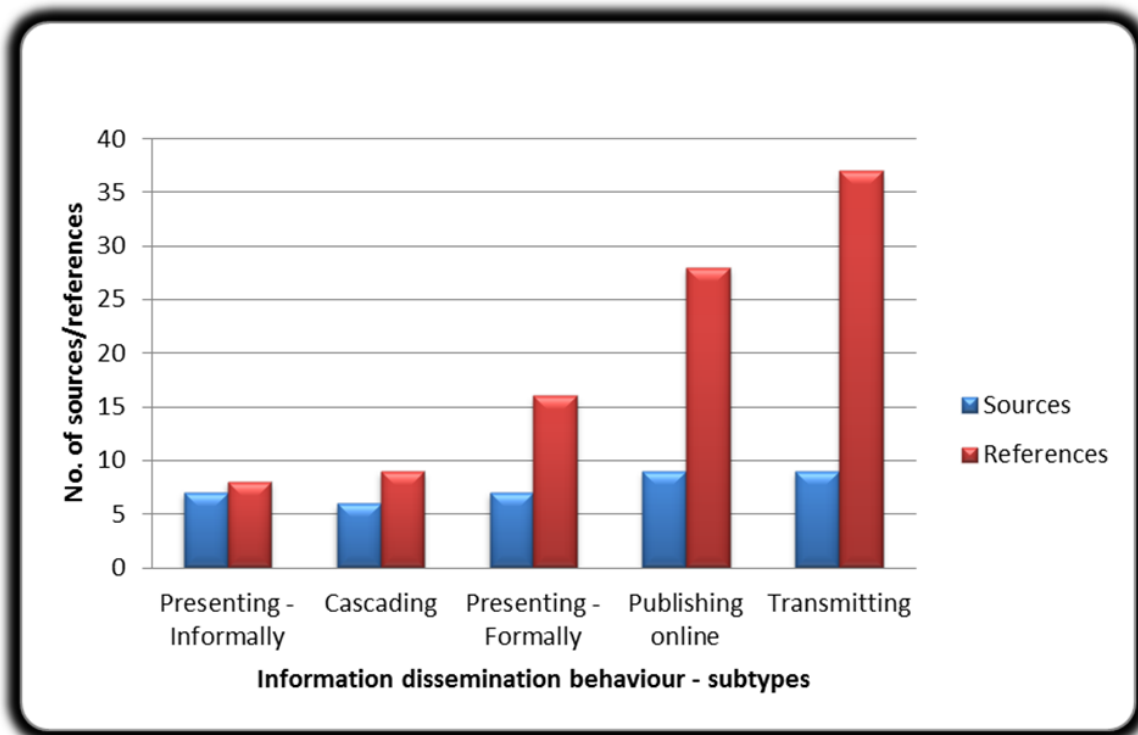
Figure 5.10 Sub-themes (categories) of information dissemination behaviour

In figure 5.10, transmitting as a sub-theme of information dissemination behaviour was mentioned the most frequently by a total of 9 interview participants compared to presenting informally which was mentioned the least frequently and by a total of 7 interview participants. This was not surprising because transmitting includes emailing which is the most common means of non-face-to-face communication throughout the organisation.

The sub-themes in figure 5.10 are interpreted as being organised in a hierarchical way and related to information dissemination behaviour as shown in figure 5.11 below. Here, the five sub-behaviours (sub-themes) are subtypes of information dissemination behaviour. Information dissemination behaviour therefore refers to the information activities involved in giving away information. However, giving away information could take place with the intention of getting something back such as feedback or enhanced organisational profile. It could also take place as a result of responding to the needs of an information consumer.
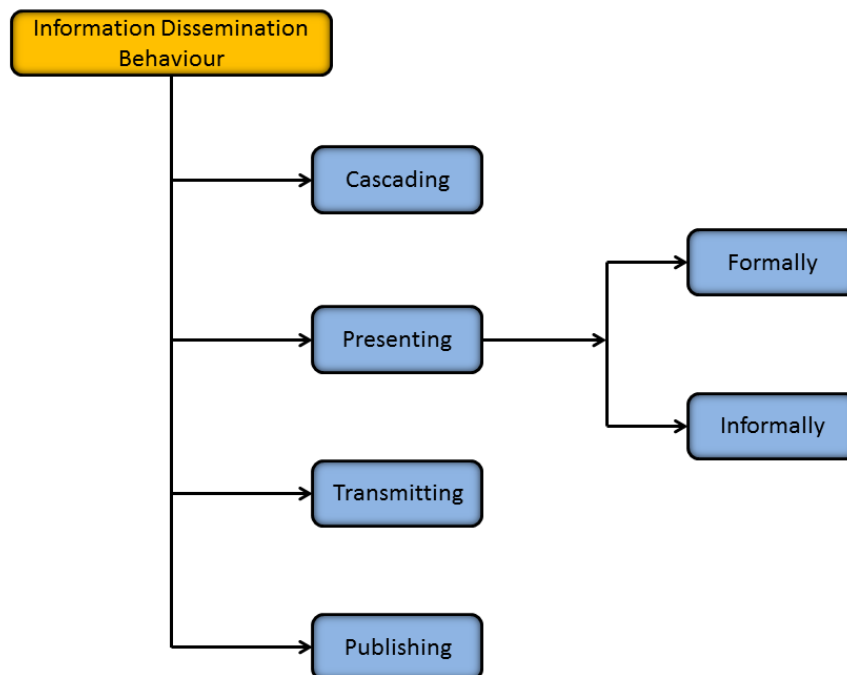
Figure 5.11 Information dissemination behaviour and its subtypes

5.7.1 Transmitting

Kim and Grunig (2011) presented information transmitting behaviour while conceptualising communicative behaviours within a communicative action model. Although no description of the behaviour was revealed, they stated that the purpose of engaging in transmitting behaviour was to give information to others. It is a one-way sharing process. In the context of the present study, information transmitting behaviour is the giving of information to others in physical and electronic forms. The forms of giving within the transmitting domain, as interpreted from the interview texts, were emailing, posting out hard copies, and web-based pick-ups for larger electronic material. What was absent was the use of social media tools which, at the time of interview, was not adopted by the organisation. Dervin (2003) also explained that information transmitting behaviour was an information use strategy but again, without defining the term. Talja (2002) used the term information giving to refer to the one-way transmission of information.

Information transmitting behaviour is illustrated within the following significant statements of interview texts:

> "It will be made available, well it will be sent out via hard copies and made available on NHS boards' intranets" (AL30_T).

"We sent out information about it in our newsletter which I've said went out to 2000 people at a go each month" (BQ29_T).

"That publication will be sent out to all those who participated on the Boards, it will go to the Chief Executive and Managers of the Boards and it will go on the web" (CK28_T).

"And then the final output, as I did mention, was a final report that's then sent to the GP Practice" (EK26_T).

"We sent all our reports to the Boards via email" (EK26_T).

"We use the web to share a big document that could be too big for a lot of inboxes. You can't email something if it's 15 megs and over" (FE25_T).

"So once it's been through that process … we then put them into this document and we then circulate the document to our stakeholders and it goes pretty much throughout Scotland, England, Wales and Northern Ireland" (GO24_T).

"This report was in a format I could then save as a PDF file and send it out" (JC22_T).

"I had to save it in a format that all Boards would be able to read. So, and then just send it by email" (JC22_T).

"We had a nice paper copy to go out to Chief Executives of the Trusts and the Health Boards involved" (KJ21_T).

It was evident that transmitting behaviours comprised a number of activities such as emailing, posting, and hosting online that represented the different ways of reaching out to the end-users of the information. They interacted with cascading behaviours because, in some cases, it was expected that those who received the transmitted information would pass it on to other relevant individuals.

5.7.2 Publishing online

Online publishing behaviour is posting information on the web so that others and self can access and interact with them. The information worker engages in processes that make the information go on to the ISD website. These are fixed processes that are governed by

ISD rules and guidance for publishing on their website. The materials are published online either on a routine, timetabled basis, or on an ad hoc basis.

Tramullas and Garrido (2011) studied the weblog publishing behaviour of LIS students who used Web 2.0 technology to support their publishing behaviour and enhance interactions and collaborations with people. In ISD, at the time of data gathering, publishing online was done using Web 1.0 technology which does not support user-generated content.

The following significant statements illustrate the behaviour of publishing online:

"They were made available for the clinicians to either access on the website, as well as being sent via email, and as well as being sent via paper" (EK26_T).

"It's going to be made available on the e-library" (AL30_T).

"That information is ready to go it's on our pre-stage version of our website and will go out tomorrow" (BQ29_T).

"We put that information out by publishing a report, by putting out, sometimes, putting out press releases of the different things people tell and we are quite keen using this newsletter and evolving our web site to be more proactive and making people aware of the sort of information that we hold and where there are particular topics that we are working on"

"So and that's just produced each month online for her to see what the situation is in terms of the data submission" (CK28_T).

"It was important that this information or part of this information was made available on our website. We publish stuff on our web pages ourselves" (EK26_T).

"It was also the first year that it was decided that we wouldn't send out a paper report, unless requested, but we'd do it on the NHS… on our website" (KJ21_T).

"Typically, it would be publication of the report online" (KJ21_T).

Publishing online was done either independently or collaboratively, depending on the type of publication and the intended audience. The information would be published on ISD's

website and as such the behaviour interacted with other behaviours related to checking and ensuring the accuracy of the material.

5.7.3 Presenting formally

Presenting formally is an information behaviour that involves information forwarding to an audience so that key messages are transmitted. Kim and Grunig (2011) describe information forwarding as "planned, self-propelled information giving to others [and] the information giver forwards information proactively even if no one solicited it" (Kim and Grunig (2011, p. 127).

The proactive nature of presenting formally is demonstrated in the following significant statement:

> "And often what we might do as well is to ensure that the message is getting through and getting home, as it were, we may well do site visits where we'll present their results to that particular Board so individuals know, so it's not a case of we'll just give them a report and then run away" (CK28_T).

Ensuring that the right audience is selected is demonstrated in the following significant statements:

> "So it was done through us at a formal presentation to all the stakeholders so there was someone from the local authority, someone from the health board, someone from housing, so it was more general dissemination of the information" (DN27_T).

> "Well it's funny, if we go to a developer, obviously we do a presentation to them but did presentations to some of the big, you know, the e-Health strategy Board and people like that" (FE25_T).

Ensuring that key messages are transmitted that the audience will benefit from is demonstrated in the following significant statements:

> "We present at conferences, you know, we just go to conference. We are getting to invited to one now, because people have heard about us, they want to benefit" (FE25_T).

"In addition to the published information, we did a series of formal presentations to very senior clinicians in NHS Boards during which they had the opportunity to ask us a number of questions about the report" (HT23_T).

5.7.4 Presenting informally

Presenting informally is a behaviour that includes the everyday giving and sharing of information so that key messages may be given to the information recipients for their benefit and feedback is obtained for the benefit of the information giver. Makri and Warwick (2010, p. 1764) uses the term "giving out and obtaining from others" to describe the sharing behaviour among colleagues and peers. Li et al (2007) highlight the importance of information sharing which may vary from context to context, depending on the culture, interpersonal connections and the collectivism of the givers and receivers.

The giving-and-receiving aspect of presenting informally is demonstrated in the following interview text extract:

"We even presented an advanced draft copy to team members who were available on the day and used the feedback to refine the document (KJ21_T).

"We also do lots of test presentations to colleagues during our team meetings to see what they say about our findings" (FE25_T).

The culture of the teams is such that there is a high degree of collectivism which promotes the informal presentation of information. It is demonstrated in the following interview extract:

"We are all aware of each other's work because we do these mini-presentations at team meetings to share information" (GO24_T).

Sometimes, the purpose of presenting informally is for the sole benefit of the information recipient and it is demonstrated in the following interview extract:

"In addition to emailing them the reports, we do informal presentations using our laptops during our scheduled visits just to focus on those areas on they require further clarification" (EK26_T).

5.7.5 Cascading

Information cascading behaviour takes place when information is disseminated to others who are, in turn, expected to disseminate it to others in spite of their personal information signals. Information cascading is discussed in depth in Easley and Kleinberg (2010), Chiu, Wei and Lin (2007) and Smith and Sørensen (2000) and it is a well-established phenomenon in the fields of social networks, gaming and communications. In the study location, there are individuals outside the organisation that must receive some of the outputs from the information workers in order to use them to make decisions at their local level. Due to lack of contact details, in most cases, use is made of known contacts to act as disseminating intermediaries for the information workers.

Cascading behaviour is evidenced in the following significant statements:

> "However, I always encourage our contacts in the NHS Boards that receive our information to, in turn, disseminate it locally" (AL30_T).

> "We email the managers and we expect them to disseminate the information to the appropriate individuals within their Boards, because often we would find it really difficult for clinicians out there to give us their right email addresses" (EK26_T).

> "Two of the boards actually used the report to not just, you know, not just the content reading, actually put it in their own health board wide intranet so that lots of other people receive it as well" (JC22_T).

However, when engaging in cascading behaviours, there is the expectation that another person or persons or technological medium will act as information intermediaries in order for the behaviour to be categorised as information cascading behaviour.

5.8 Multitasking information behaviour

The multitasking information behaviour theme comprises the sub-themes concurrent multitasking and sequential multitasking as shown in figure 5.12 below.
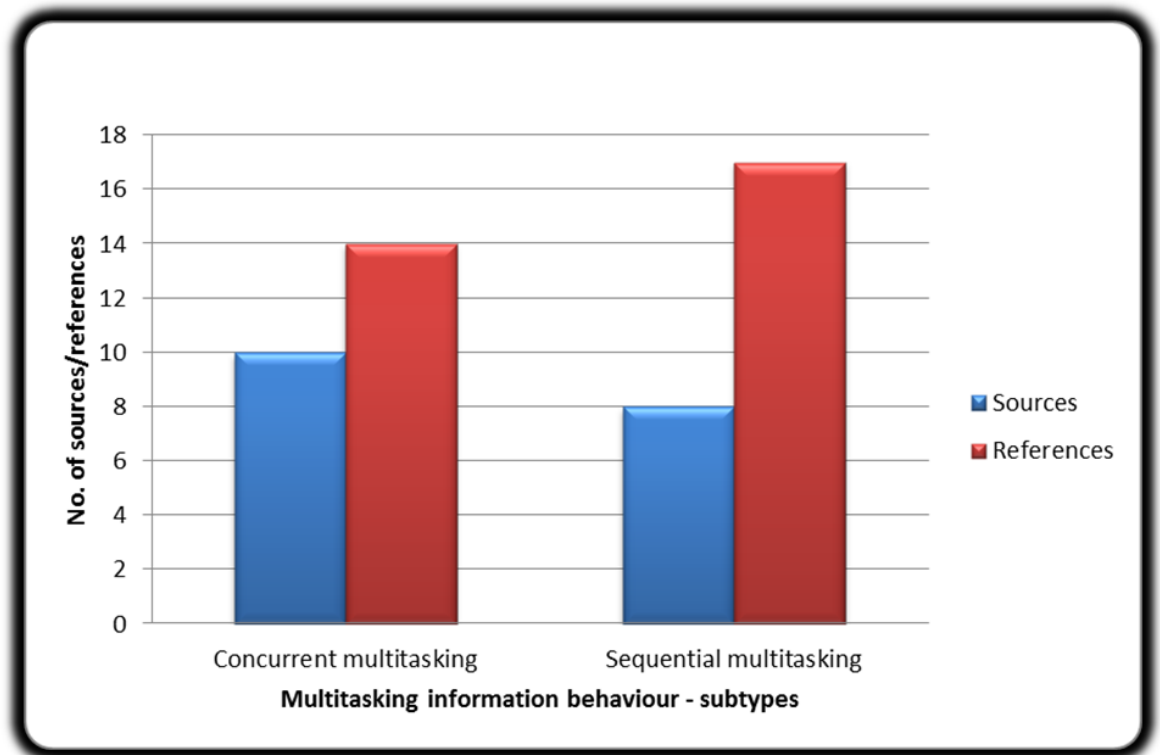
Figure 5.12 Sub-themes (categories) of multitasking information behaviour

In figure 5.12, sequential multitasking was referred to more frequently during the interviews than concurrent multitasking. However, all 10 interviewees experienced concurrent multitasking whereas only 8 interview participants experienced sequential multitasking.

In figure 5.13, a representation of the subtypes of multitasking is shown. It is a straightforward relationship with both concurrent and sequential multitasking behaviour being subtypes of multitasking information behaviour.
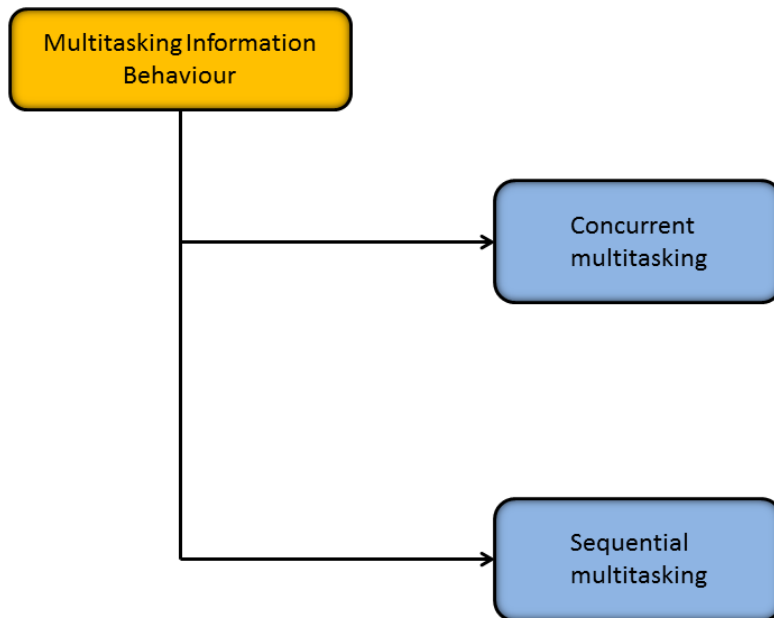
Figure 5.13 Multitasking information behaviour and its subtypes

The interview participants experienced multitasking behaviour within the information acquisition, information production and information dissemination domains. Multitasking, in their opinion, is an inevitable mechanism for coping with lots of information even with work interruptions while striving for increased effectiveness, efficiency and productivity.

Multitasking information behaviour is when people switch from one task to another with the time between switching tasks ranging from negligible (microseconds) to long (hours) (adapted from Salvucci and Taalgen 2011, Salvucci, Taatgen and Borst 2009 and Spink 2004). Evidence of sequential and concurrent multitasking is discussed in sections 5.8.1 and 5.8.2.

5.8.1 Sequential multitasking

Sequential multitasking behaviour takes place when there is subjectively noticeable amount of time (e.g. minutes to hours) between task switches. Sequential multitasking was found to be experienced by the information workers during all the stages of information acquisition, information production and information dissemination.

During sequential multitasking information behaviour, information workers may engage in two or more information tasks as also identified in Spink (2004). The following examples demonstrate the task-switching process:

"I would dedicate maybe ten/fifteen minutes to it, but I might do that three or four times over the course of the day" (AL30_T).

"It could be another query that you're doing for someone else or preparing the email that you're going to send or the format or the way that you're going to send the information back to the customer. While you're waiting for that to run you could be formulating your email and then you're going to attach your information to that afterwards" (CK28_T).

"You tend to be multi-tasking most of the time anyway. I mean, if I'm looking for something I'll spend the time until I find the information and then I'll keep that information up and sometimes you look at another window just to make sure you've got all the information you've got available to you and then phone the person or compose an email" (FE25_T).

"I leapt back into an email having just re-read a paragraph, and then went back into Wikipedia and looked at it and thought "oh, yes, and let's follow up that, and let's go there" and then back to the email" (KJ21_T).

At other times, sequential multitasking information behaviour may be triggered by interruptions to information tasks that the information worker is engaged in as the following excerpt shows:

"I am continually interrupted. I will be in preparing a PowerPoint presentation and then the telephone rings for me to deal with an issue that takes 20 minutes of my time; and then I go back to writing the presentation" (BQ29_T).

The desire to task-switch is highlighted in Spink (2004) where she explains that the desire precedes the task-switch which, in turn precedes the return to the previous task. An interview text excerpt follows:

"Sometimes one part of the report may have impact on another part of the report, and you may have to consult the notes to check, you know, the READ codes, and then check the completeness before going back to check the codes because the number of contacts couldn't be identified here" (EK26_T).

5.8.2 Concurrent multitasking

Concurrent multitasking behaviour takes place when "each task progresses either simultaneously or with very short interruptions" (Salvucci and Taatgen 2011, p. 8).

However, because sequential and concurrent multitasking are represented on either sides of a multitasking continuum as described in section 2.4.1.3, the distinction between the two in terms of the duration of the time between task switches is not necessarily always indisputable (Salvucci and Taatgen 2011).

The following significant statements from interview texts illustrate concurrent multitasking:

"So I could be filling out the spread sheet, and be on the net to find the information and do the email to the person or phoning the person I want to speak to" (FE25_T).

"I would be on the phone to a key stakeholder and we go through a document which will be up on my monitor. He or she would have the same document up on their monitor and we read, while skim-reading, key sections of the document" (BQ29_T).

"Sometimes, when I need feedback quickly, I would email a colleague a document I've written and then phone them at an arranged time to get feedback. As he or she gives me feedback on the phone. As they are talking, I would quickly take down the key points which would help me to make amendments to the document" (BQ29_T).

"There would be things happening like a phone ringing and a colleague asking something else and even a piece of email coming in" (KJ21_T).

The evidence shows that task switching during concurrent multitasking occurs very quickly, possibly ranging from fraction-of-a-second to a few seconds. However, the research questions did not require a detailed examination of the process of task switching.

5.9 Collaborative information behaviour

Figure 5.14 shows that peer-to-peer situational collaboration sub-theme was most frequently experienced by the interview participants as well as reported as being experienced by 9 interview participants.
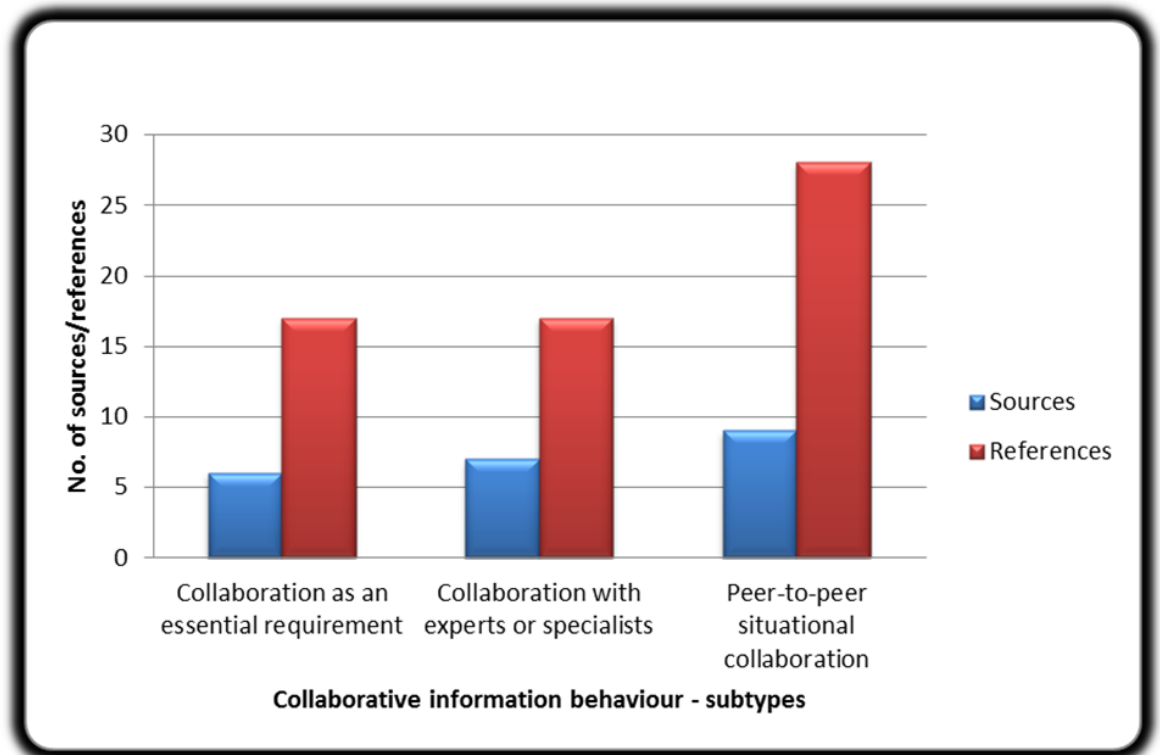
Figure 5.14 Sub-themes (categories) of collaborative information behaviour

Figure 5.15 below shows a representation of the relationship between the sub-themes and the collaborative information behaviour theme. Collaboration as an essential requirement, collaboration with experts and specialists, and peer-to-peer situational collaboration are all sub-sets of collaborative information behaviour.
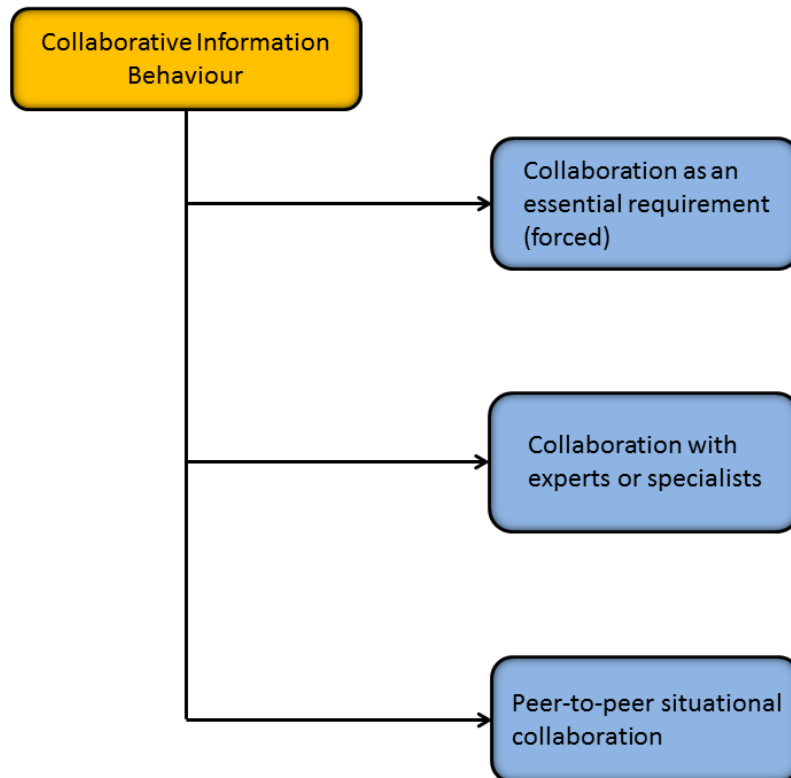
Figure 5.15 Collaborative information behaviour and its subtypes

Collaborative information behaviour takes place when people work together for a common purpose. Collaborative information behaviour was experienced by the interview participants within all 3 domains of information seeking, information production and information dissemination. One example of this was a statement by one of the interview participant, KJ21_T: "We worked as a team in putting together our findings, analysing the data we brought back, and reporting on it back to the individual hospital". This showed the extent of collaboration as the information flowed through the organisation and left the organisation. Another example is a statement by interview participant AL30_T: "The whole process, from the collecting of the information right the way through to the provision of the information, has been done as a collaborative exercise, with those people that are going to be using it, I would hope would make it a bit more successful".

The importance of collaborative information behaviour in ensuring that workload gets spread across information workers and each person contributing to the work is captured by the following statement by interview participant HT23_T: "The fact that the work involved in the project was split between a number of people meant that I never felt particularly pressurised".

5.9.1 Peer-to-peer situational collaboration

In Shah's (2010) study to understand the process of collaboration that involved interviewing a total of 11 graduate students and faculty members, he found that peer-to-peer situational collaboration most commonly existed among the interview participants. Likewise, in this study, as shown in figure 5.14, peer-to-peer situational collaboration was the most common of the 3 sub-sets of collaborative information behaviour.

Peer-to-peer situational collaboration takes place when colleagues and peers work together for a common purpose. The following excerpts demonstrate this:

"We had to come up with these outline costings or truly we needed to get some information together to say how long we thought it would take to do various different components of the development work … so in order to do that we've involved quite a number of different parties within ISD including the business analyst team, in IT, here and folks in the Scottish Government and liaising with people in Glasgow" (BQ29_T).

"I mean it wasn't just my hard work. Others were involved in it too - from people who were involved in the very early phases of seeing what information was already available, who I think you know quite well, to others who project managed the latter phases of that work" (BQ29_T).

"We work quite closely with the Scottish government in particular aspects of the project. So we would give them a chapter, for example, and say to them, "Please get back to us in a month's time" (DN27_T).

"There was lots of communication between us, the public health consultant, you know, there was senior managers, analytical staff, development officers, just trying to really work together on, you know, using our knowledge, using our skills, you know" (EK26_T).

"So they'll forward me an email or whatever and I can include that in the next part and all my colleagues in implementation, we all work together, just divvy up the work and to make it nice and easy and keep it consistent" (FE25_T).

"Because … was one of the developers and I was the … then you had … who's a clinical adviser, it's almost like a triangle, and sometimes we would split the work

between the three of us where we would look at 3 different pieces of maybe information and concentrate on that before joining them all up" (GO24_T).

An experience of peer-to-peer collaboration was likened to a production line where every information worker had their own information tasks that they contributed to producing a final information product:

"Yeah, there may be a case of, you may be compiling certain parts of the report and other parts are being checked by the other people so it's probably fair to say it's like a production line. Things would be produced, other people would check them" (CK28_T).

The value of peer-to-peer collaborative information behaviour was captured by the following significant statement:

"Yeah, I mean, we sort of discuss it with key people within the team just to see, "Can you have a look at this? Does this, would you interpret this the same way? Do you think this is interesting? Do you think we're missing out something?" So it would be done collaboratively. It wouldn't just be me. I think it's important when you're writing reports or interpreting data to do it with other people because you get the, you're combining knowledge which I think is a good thing" (DN27_T).

The peer-to-peer situational collaboration activities reflected the power of the value-adding information behaviours that permeated ISD where information workers, each with their skills and expertise, would come together for the common purpose of acquiring, producing or disseminating information for the benefit of the end-user.

5.9.2 Collaboration as an essential requirement

Collaboration as an essential requirement is referred to as forced collaboration in Shah (2010). It takes place when people must work together for a common purpose because of a variety of reasons such as having to comply with rules of working, being told they must collaborate or having to comply with new ways of working due to past experience.

The following significant statements from interview transcripts depict collaboration as an essential requirement:

"They will then be passed to the Boards to check and the Boards will say, "Either both records are fine or no, that's incorrect, can you remove that one?" Or they will remove it themselves. But we can't make the decision ourselves because it's

the Boards' data. We have to go back to the Boards and they will decide which records should be deleted" (CK28_T).

"You always have to do it in collaboration with one other member of staff because it's easy to misinterpret information, or to make a slight mistake" (EK26_T).

"We didn't have to consult what had been done in the past but there were a number of people, sort of internal stakeholders if you like, who had an interest in the data and therefore they had input to the wording of the questions and that was very important because the meaning had to be clear" (HT23_T).

5.9.3 Collaboration with experts or specialists

Collaboration with experts or specialists is referred to as expert-novice role in Shah (2010). In this type of collaborative behaviour, people work together for a common purpose because of the expert or specialist input that is required. This is depicted by the following significant statement:

"They would take it back and speak to their own experts locally, so you would get people saying 'My IT manager has had a look at this, and he thinks you need to add this or you need to take this out.' It was also that, you know, obviously I had to go to Scottish government; I had to go to the National Information and Security consultants, so I went round a sort of fairly broad group of people involved" (AL30_T).

These significant statements are examples of collaborating with IT specialists:

"And the final collated version would also go to the information technology security officers for comment" (AL30_T).

"We worked closely with the IT guys as they knew how to resolve technical issues" (HT23_T).

The following significant statements show the need for collaborating with clinicians who are experts in their field:

"Because we're not clinicians, we're not the expert on their system so they have to give us the data proof explanation of this standard that they've got" (FE25_T).

"We then give it to our clinical advisors just to have a clinical aspect too because it is a different way of thinking. Clinicians think differently. We have a range of clinicians within our programmes and we choose the best one in that appropriate field to then give it a sort of sense check before it goes back to the developer" (FE25_T).

The following significant statement shows the need to collaborate with experts in communications and customer relations in relation to the organisation's website:

"Publishing on the web - it was down to two of us out of the team but we were taking advice from a communications person and customer relations who had a certain type of expertise that we didn't have" (FE25_T).

5.10 Feelings as outcomes of information behaviour

In chapter 2, it has been argued that feelings are an important consideration in studies of information behaviour. Tenopir et al (2008) refer to feelings as affective behaviour and Kuhlthau (2008) explains that feelings comprise one of the three realms of human experience; the others being thoughts and behaviours.

Figure 5.16 below shows that frustrated feelings as a sub-theme of feelings were, by far, the most frequently mentioned feelings state by the interview participants. All 10 interview participants experienced frustrated feelings as outcomes of information behaviour. The next most commonly experienced feelings sub-theme was satisfaction. The least experienced feelings sub-themes were – excited, confused, uncomfortable, overwhelmed, hopeless and annoyed. However, for those individuals who experienced these feelings, they represented meanings for them as they engaged in information behaviours.
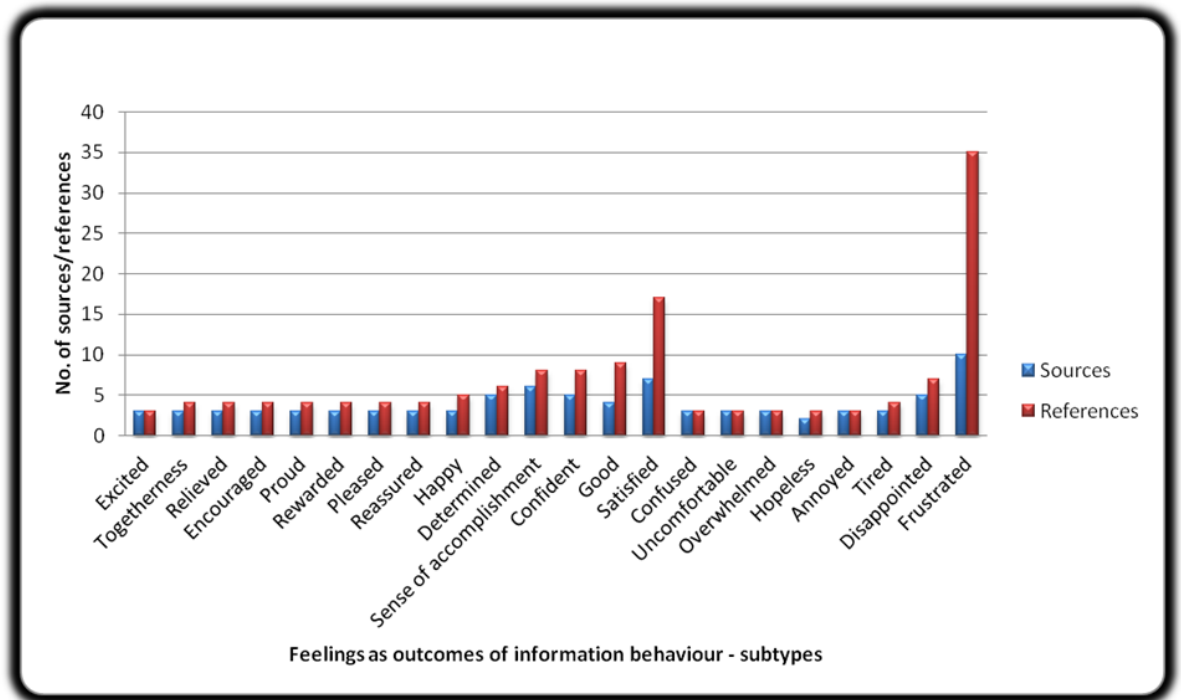
Figure 5.16 Sub-themes (categories) of feelings

In figure 5.17 below, the feelings sub-themes are interpreted as being positive feelings or negative feelings and they are both types of feelings as outcomes of information behaviour. Scherer (2005) also used positive and negative to classify feelings.

Feelings may comprise (i) automatic unconscious affect, (ii) conscious, cognitively processed emotions, and (iii) moods. However, as explained in section 2.5, the study focuses on the conscious feelings related to emotions because they are more likely be self-reported during interview due to the cognitive processing involved.

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┌─────────────────────────────┐
│   Feelings as outcomes of   │
│    Information Behaviour     │
└─────────────────────────────┘
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Positive Feelings

Negative Feelings

Satisfied
Good
Sense of accomplishment
Confident
Determined
Togetherness
Excited
Relieved
Encouraged
Proud
Rewarded
Pleased
Happy
Reassured

Frustrated
Disappointed
Hopeless
Tired
Annoyed
Confused
Uncomfortable
Overwhelmed
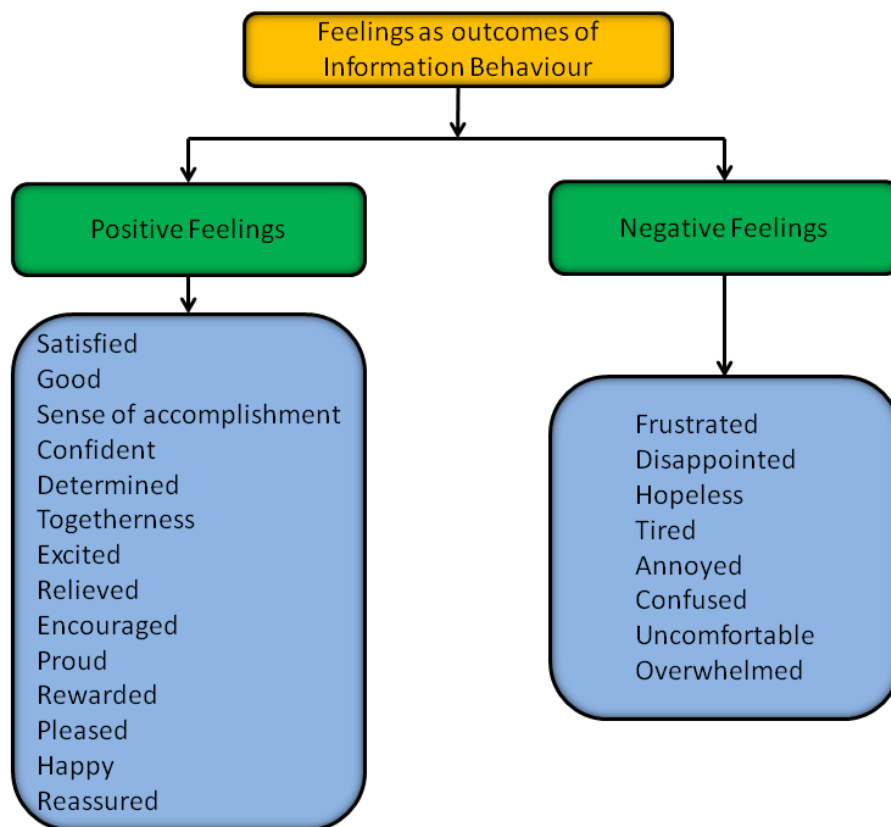
Figure 5.17 Feelings and their subtypes

Figure 5.17 illustrates that the information workers experienced a wider range of positive feelings than negative feelings. The general impression is that the interview participants tended to have a more positive perception of their experiences of information behaviour than a negative perception. One interesting observation was that neutral feelings, such as those associated with the words "careless, indifference and ignore" (Tenopir et al 2008, p. 110) were not identified during interview but were explored during the respondent validation exercise and the quantitative survey phase.

5.10.1 Positive and negative feelings

By using emotion coding as described in section 4.5.6.2 and formulating meanings from the significant statements, 14 sub-themes of positive feelings were identified as shown in appendix 12 and 8 sub-themes of negative feelings were identified as shown in appendix 13.

The information workers each experienced more than one of the positive and negative feelings as an outcome of each of the 3 core information behaviour types – acquisition, production and dissemination. The feelings identified in appendix 12 and 13 have been

used by several authors studying emotions, affect and mood. They are too numerous to state here but the main authors include Scherer (2005) who identified a long list of feelings and their synonyms, Thompson (2007) who developed a validated short-form of the positive and negative affect schedule, Tuccitto, Giacobbi and Leite (2010) who provided validity evidence of the internal structure of the original positive and negative affect schedule, Nahl's (2001) table of users' affective symptoms, Tenopir et al's (2008) affective coding list compiled from a study of academics' information interactions, and from Kuhlthau (1993, 2004, 2008), whose "studies were among the first to investigate the affective aspects or feelings in the process of information seeking along with the cognitive and physical aspects" (Kuhlthau 2008, p. 67). This is evidence that these feelings which are experienced by end-users of information and in other disciplines are also experienced by information providers as they engage in value-adding information behaviours for the benefit of the end-user.

5.11 Perceived internal impact of information behaviour

Figure 5.18 below shows the sub-themes of the perceived internal impact of information behaviour theme.
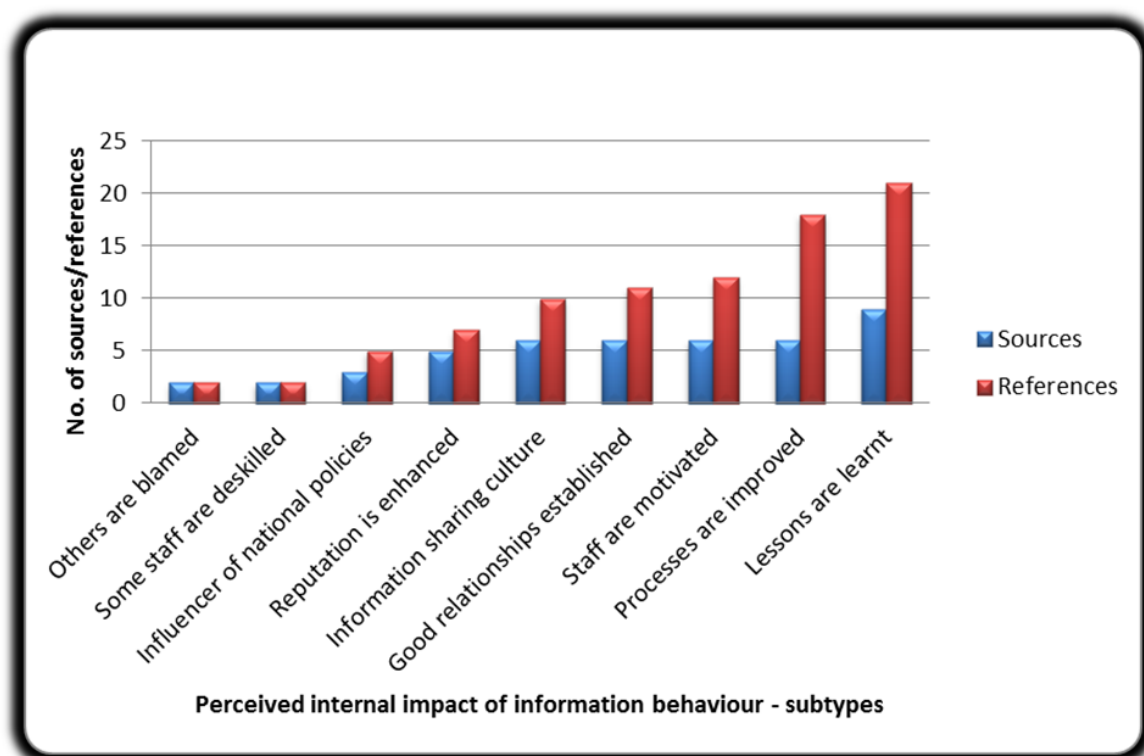
Figure 5.18 Sub-themes (categories) of perceived internal impact of information behaviour

In figure 5.18, it is evident that there were more positive leaning perceived impact themes than negative leaning perceived impact themes with 'lessons learnt from experiences' as a perceived impact of information behaviour being the most frequently mentioned sub-theme during the interviews. A blame culture and deskilling of staff, the 2 negative perceptions of impact, were the least mentioned during the interviews.

The relationship between the sub-themes and perceived internal impact of information behaviour is as shown in figure 5.19 below.
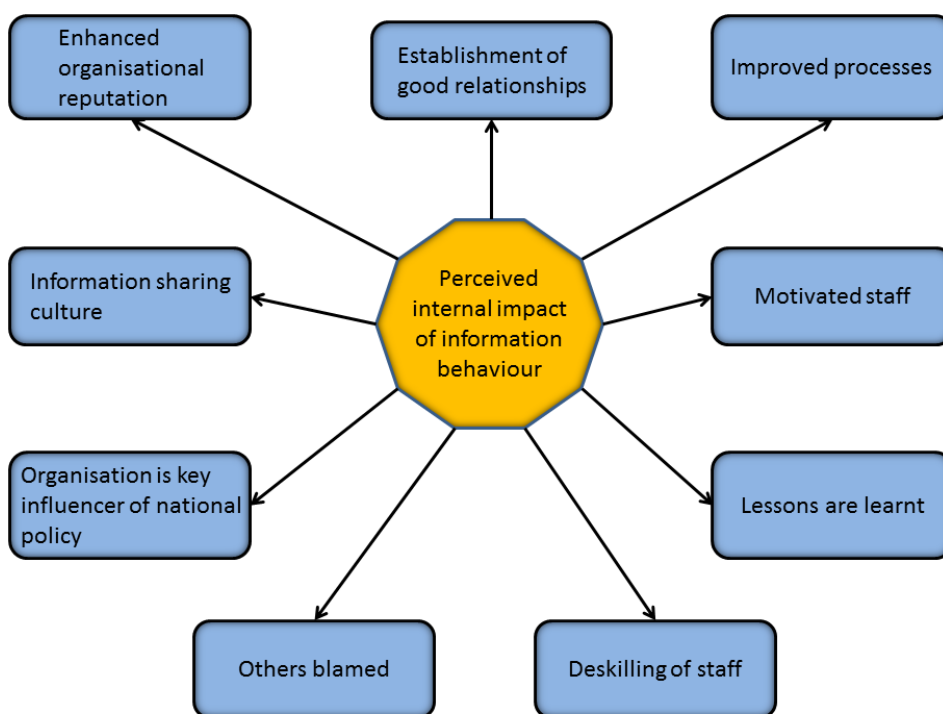
Figure 5.19 Perceived internal impact of information behaviour and its subtypes

Perceived internal impact of information behaviour refers to the subjective opinions of the information workers with regard to the longer term changes in state, attitude or behaviour occurring in the people, systems or the organisation as a result of the information activities and engagement with the information outputs. The people, systems and the organisation comprise the internal environment of ISD. The subtypes of perceived internal impact shown in figure 5.19 could not be categorised further because each subtype referred to people, systems (teams) and the organisation as a whole. Also, as they were subjective opinions, it was decided not to classify them into, for example, simple/complex, critical/trivial, direct/indirect and intentional/unintentional and, instead, focus on what the information workers revealed as their opinions.

The 9 subtypes of perceived internal impact of information behaviour illustrated in figure 5.19 are described in the following sections.

5.11.1 Improved processes

One of the ways that the information workers perceive their information behaviour as impacting on the internal environment of their organisation is the improvement in internal processes in the organisation. As explained in section 5.1.1, the internal environment refers to the organisation as a whole together with its people (staff) and systems. The information workers give examples of improved processes such as improvements to the handling of information requests from customers, better information dissemination processes, improved lead times, and more knowledge of how to solve complex problems.

The significant statements below illustrate these findings:

> "We're able to focus, we're able to respond quicker to requests, we're now not quite as reactive as we were" (JC22_T).

> "If we're involved in doing this kind of thing again, we will insist on reporting on it ourselves because we are so much slicker these days in the way we do things" (KJ21_T).

> "I would see the longer-term effects as positive because there are now processes in place that cut down an awful lot on the time that it takes to produce these kinds of outputs" (JC22_T).

> "If questions about a particular data item are being asked for in the future and we're not able to answer them immediately, then there's now a way of getting that added to the limited data set and turn things around quickly so that you get more success rather than failing all the time. This is down to the fact that IT now have a lot of experience in helping us make sense of the data set" (CK28_T).

The findings demonstrated that improved processes, as perceived by the information workers, would affect individuals as well as the teams or groups that they belong to, thus having an effect on ISD as an organisation. The excerpts also showed that improved processes would add more value to the information for the end-user in terms of faster response times and improved accuracy.

5.11.2 Enhanced organisational reputation

The information workers perceived an enhancement of the reputation of their organisation as a result of the information behaviours that they engage in. They reveal that their information behaviour results in a high quality of work which is appreciated by the customer and will thereby enhance the reputation of ISD. The following significant statements illustrate this point:

> "Well, with our expertise being widely acknowledged by many of our stakeholders and customers, it can only be good for our reputation which is respected at multiple levels in the health service and the government" (BQ29_T).

> "I think the way we handle our customers proves to them that ISD can be quite efficient and I suppose it demonstrates to the customers that all the data we receive, you know, routine data, eventually goes back to customers in an enhanced format, it's just not one flow of information. I think it's good for people to see that it's not just about processing information. It's also about reporting information and giving it meaning. I think that's going to make us look good in the eyes of the customers" (DN27_T).

> "I think being able to turn around quickly responses to information requests and produce a series of favourably regarded reports reflect well on ISD and will continue to do so in the long term" (HT23_T).

By referring to enhanced organisation reputation, the information workers perceived ISD as an organisation experiencing enhanced reputation as a result of the information behaviours of their information workers. An example of an information worker highlighting evidence from a customer to support their perception of enhanced reputation is as follows:

> "I think enabling customers in Boards to generate bespoke reports themselves using the data we process here will be good for our reputation. The feedback we get is very encouraging" (JC22_T).

5.11.3 Lessons are learnt

The information workers perceive their organisation as being a learning organisation as a result of their varied experiences of information behaviour. They perceive a situation in which, when information workers have experiences of information behaviour, the teams or workers as well as the organisation as a whole learn from both the positive and negative

experiences. The interview participants also emphasise the long-term nature of the learning. The following significant statements illustrate these points:

"We now know that if similar information requests come in to ISD in the future then it's going to be very easy to deal with. We know exactly where to go to, having gained tons of experience and learnt from them" (AL30_T).

"I think the team would have learnt from the difficulties encountered in trying to unsuccessfully model the inadequate data that we had in response to the customer's needs, rather than initiate a project that would have considered all the inherent risks, benefits and disbenefits. So yes, the impact would be an internalisation of the difficulties experienced and lessons learnt" (BQ29_T).

"Even the frustrations experienced in analysing inadequate data and the eventual agreement amongst the team for a way forward for the customer would result in long-term lessons for future handling of similar requests" (BQ29_T)

"I think we all learned a lot of new things by working within a project management environment to deliver on time what our customer wanted. Learning would, in my opinion, be the long term outcome of this experience because such knowledge and skills could be applied successfully when responding to demands from many of our customers." (HT23_T).

"That was a bit of a learning experience! We gained a lot of skills and knowledge along the way even though we so frustrated. We now know how important it is to have a cohesive team where all the roles are clear so that putting together the findings is slicker. So, I would say learning from our experiences is something that would stay with us for a long time and be put into good use in the future" (KJ21_T).

This perceived impact focused more on the teams and the individuals within ISD rather than the organisation as a whole. However, with the individuals and the teams comprising the human elements in the organisation, then, by inference, it is expected that the organisation as an entity will learn from the lessons of the past.

5.11.4 Organisation is key influencer of national policy

The interview participants were keen to emphasise that their organisation was becoming a key player in influencing national policies because of their outputs that flow from their information activities. They also noted that, being able to influence national policy is

being able to help the people of Scotland. These points are evidenced in the following significant statements from the interviews:

> "Of course what it does for ISD is that it develops a good reputation which policy makers at the Government take note off when they require information for developing their policies" (AL30_T).

> "We're actually disseminating that information and, without doubt, it will be included in the national planning for services and therefore help ordinary people" (DN27_T).

It was evidenced that the information workers were positive about how they perceive their information behaviours impacting the organisation in such a way as to make it a key influencer of national policy which subsequently benefits the people of Scotland. They even highlight real-life examples to support their perceptions:

> "The impact? They really put it on the agenda. Some of the things that they are now doing in [redacted] like benchmarking and the introduction of national performance management indicators have been influenced by our services" (BQ29_T).

> "Well it's now written in to the specification for national procurement for [redacted] information systems. We are becoming more and more influential" (BQ29_T).

5.11.5 Motivated staff

The third most frequently mentioned perceived impact of information behaviour was motivated staff. The interview participants were convinced that the positive outcomes of their information behaviour would result in motivated staff within the organisation in the medium-term and long-term. This is evidenced in the following significant statements:

> "I'm sure it has the effect of making us very motivated. Imagine, supplying the right information in the right format to a customer who is immensely appreciative of what we've done. Without a doubt, it gives us that extra drive for the future" (AL30_T).

> "The impact on the team is motivation. Particularly the monthly stuff because the clock's running a wee bit with that kind of stuff and the quarterly reports have to go out. As they go out on time, they are more and more motivated" (CK28_T).

"The lasting effect is that you're motivated in your work that you're doing. I think you get the feeling that you've done a good job, particularly if you get feedback from them saying, "That's great, that's exactly what I'm looking for, thanks very much." So that nourishes you and feeds you for the next problems that come up (CK28_T).

"It's very, it motivates you in the future to get on with your work and develop things further. That's the effect it has on us" (GO24_T).

This was a very good example of the positivity inherent in the information workers' perceptions of impact of their information behaviour. A motivated workforce can in turn have good implications for the organisation as a whole with regards the quality of the information service and information products for its customers.

5.11.6 Establishment of good relationships

Good relationships between individuals and teams within the organisation as well as with external stakeholders and customers were perceived as some of the long-term effects of the information behaviour of the information workers. This is evidenced in the following significant statements:

"I think it helped to develop my relationships with the individual contacts as well. And these relationships are long-term relationships because of the nature of the on-going work we do" (JC22_T).

"We were able to produce four reports in total from the information that was gathered and we were able to establish some strong links with the community of health professionals in Scotland. Other programmes have used our strong links to develop better relationships with the health service" (HT23_T).

"Even the developers working along with us - it's quite positive for them as well knowing that they are actually finding the information we're looking for. This is good for continued internal relationships between teams and groups" (GO24_T).

"That impacts on us positively - not just us as a team but ISD as a whole - because of the excellent collaborative working relationships we have formed with such key stakeholders" (BQ29_T).

It was evident that, not only was there a perception of medium to long-term good relationships within the organisation as a result of information behaviours, but also between the organisation and other stakeholders which can only be a positive thing for the organisation.

5.11.7 Information sharing culture

Another perceived impact of information behaviour on the organisation's internal environment was the establishment of an information sharing culture. The interview participants felt that their disseminating behaviours as well as their collaborative work across the core information interaction stages of acquisition, production and dissemination would contribute to the establishment of an information sharing culture in the medium to long term. This is evidenced in the following significant statements:

"The positives are that for us is that we build up a loyal followership of people that are interested in the work that we are doing and in the work that others are doing and we become information brokers if you like, tell people what each other are doing build quite a useful network in which information can be shared. This culture of sharing information is the long-lasting effect of the work that started by just sending a newsletter to a few key contacts" (BQ29_T).

"It's good to see that other people are having the same problem. The collaborative work's good because they might have people… they might hopefully at some time have somebody who comes up with a great idea of doing it, or we might do. It's really good to share insights and approaches and this sharing culture is very much embedded in our processes" (AL30_T).

"As a result of distributing such rich information to our stakeholders and customers and receiving such glowing feedback, a sharing climate is allowed to permeate within ISD. This makes us work harder to make sure our customers' needs are considered in any major decisions to do with changes to our website or even training of new staff" (EK26_T).

"Well, I think we can feel a warm glow of satisfaction and a feeling of camaraderie, of a shared experience. I think these are sort of common experiences when you do something together, when you all pull together to a common goal. The impact they have on us is instilling a spirit of information sharing both within the organisation and with other organisations (HT23_T).

It was evident that a combination of the various information behaviours, which would result in the information workers sharing information both within and outside the organisation, contributed to their perceptions of such a sharing culture developing in the organisation in the medium and long term. This was supported by the feedback the information workers would receive from the end-users of their information.

5.11.8 Others blamed

A tendency to blame others within teams was yet another perceived internal impact of information behaviour. This perception was explored further during the respondent validation workshops to check whether an understanding of the concept and its manifestation could be enhanced. The tendency to blame others was related to when information workers don't produce or disseminate high quality outputs and are therefore made to take the blame for the unsatisfactory work instead of providing the necessary support. It is evidenced in the following significant statements:

> "I would say that a long-term effect of this within the organisation is that one area would develop the tendency to blame another area when something goes wrong rather than face up to what is within their sphere of influence and deal with it. Maybe I'm wrong but that's how I see it" (CK28_T).

> "I think one of the impacts is that where things are going badly, it's very easy to start blaming each other and actually thinking, "Well, I've done my best here but this is somebody else's fault because they haven't done what they were supposed to do, they haven't fulfilled their role as completely as they ought to have done"". (HT23_T).

5.11.9 Deskilling of staff

Deskilling of staff, as a perceived internal impact of information behaviour, was related to when staff become deskilled when they are not given the opportunity to actively engage in handling and responding to customer information enquiries. Examples of significant statements that demonstrate this are:

> "Yeah, it's a double edged sword, obviously, because if you're good at finding something people will just rely on you to find something rather than doing it themselves. It's almost de-skilling them. And that's how it would impact us as a team" (FE25_T).

"Well - the longer-term effects on the team - for those in the team who haven't dealt with this type of request before or worked with me in responding to the customer, I'm not sure whether they would have the skills and knowledge to handle it in the future without me and others with experience being involved. Even if I take them through what I did, because the information request is rare, I'm not sure they will remember. I'll have to find time to document the procedure" (AL30_T).

However, some other interview participants revealed tactics they would use to ensure other information workers were active participants in information tasks. The following example demonstrates the approach:

"If I was swamped with work, I would ask a colleague in my team to handle aspects of the information request by gathering the necessary information that the customer requires. These were opportunities for others to gain experience of answering these types of questions" (KJ21_T).

5.12 Robustness of the qualitative research phase

In chapter 4, the present study's framework for research quality and rigour was presented in section 4.4.2. This section describes the evidence that supports the framework with regard to the qualitative phase. As shown in table 4.4, the research quality and rigour indicators for the qualitative phase are credibility, transferability, dependability and confirmability. Each one is addressed in turn in the subsections that follow.

5.12.1 Credibility

Sections 5.2 to 5.11 in this chapter have presented and explained the findings of the qualitative interviews. To do this, evidence – that is, significant statements that were real statements and therefore excerpts from the interviews with research subjects – was provided to support the researcher' interpretations of what the interview participants were trying to convey. In addition, during the presentation of the findings, there was constant reference to the literature and how the concepts that emerged from the analysis of the interview transcripts had congruence with what exists in the literature.

There was prolonged engagement in the field, as explained in chapter 3, where many months were spent planning and conducting pilots and interviews. These contributed to a better understanding of the structure of the social setting with regard to the amount of intrusion that would be allowed, the time devoted to interviewing, and the spacing, time of day and location of interviewing. The researcher's understanding of the cultural and

social setting were enhanced due to the researcher's previous experience as an information worker within the study location which was both an advantage in terms of foreknowledge and an issue to acknowledge when ensuring that personal views and experiences did not overwhelm the interpretive phenomenological approach. This situation, however, is common in research studies. One example is when Prigoda and McKenzie (2007) sought to understand the types of information behaviour taking place in a public library knitting group, they acknowledged that some of the research participants recognised them as ex-members of the same knitting group and this contributed to the trustworthiness of the research in terms of having a better understanding of the knitting group context and gaining trust from the research participants.

Credibility was also enhanced with both process and terminal member checks. Process member checks involved keeping the interview participants informed of progress of analysis of interview transcripts by informal conversations and presentations at their team meetings. In addition, the researcher was open to any contributions they may have following the interviews. Terminal member checks involved the formal respondent validation exercise whose findings are discussed in chapter 7.

Throughout the many years' duration of the present study, the researcher scanned the knowledge base of LIS and associated disciplines to capture any potential contradictory or corroborating evidence to incorporate in the study so as to enhance its credibility.

With an established methodological approach described in chapter 4 that has facilitated the emergence of the qualitative findings in chapter 5, it is expected that the research has sufficient credibility to give the reader confidence in its findings.

5.12.2 Transferability

In chapter 4, there was a detailed description of the research setting and, in section 5.3 (chapter 5), an interpretive summary of the experiences of information workers in ISD was presented. Together, they provide an informed view of what goes on in ISD and therefore how the findings, which are discussed in more detail in the rest of chapter 5, can be applicable to other contexts. For example, chapter 5 has revealed the type of customers and the sources of information, together with their subtypes, that are applicable to the present study's context. A different type of provider organisation such as a library or a newspaper media company will be associated with customers and sources of information but, perhaps, of different subtypes. The core and associated information behaviours as well as feelings as outcomes of information behaviour and perceived impact of information behaviour, while applicable to the ISD context, can be relevant to other information providers as well. For example, as explained in chapter 9, they provide a

baseline for managers of any information service provider from which to understand what goes on within their provider organisation, how their staff interact with information, as well as their employees' perceptions of the medium to long-term effects of their information behaviours. They also provide research opportunities for further exploration of information provider categories and sub-categories in other provider settings.

What will be common across all contexts of information providers, and require to be tested, are the broad headings of the 9 themes which capture the concept of added value where value-adding information behaviours that involve information acquisition, information production and information dissemination with the associated multitasking and collaborative information behaviour result in feelings being manifested in the information workers and opinions about the internal impact of their information behaviours.

The findings in chapter 5 are accompanied by thick descriptions of the phenomenon of information behaviour and its categories/subtypes. As explained in Lincoln and Guba (1985), it is expected that the thick descriptions should facilitate an appreciation of the extent to which the findings are applicable to other settings and types of information workers.

The interview participants were purposively sampled because of the knowledge and experience they have within their teams. Knowledge of this sampling approach will help any future researcher to understand the present study's applicability to other research contexts.

The details of the research setting, the detailed description of the methodology, and the interpretation of the findings have provided evidence to support the study findings' applicability to other information provider contexts. To add to this, chapter 9 presents further discussion of the present study's implications for practice.

5.12.3 Dependability

NVivo (QSR International 2011), a data analysis software tool, as explained in chapter 4, was used to manage the interview data. This tool provided the means for coding and recoding the data in a structured way as well as to go back and review the codes and interpretations after all the interview transcripts had been analysed. The tool also facilitated multiple readings of the interview transcripts alongside the codes so as to capture the essence of the experiences of the information workers and check whether the appropriate codes were being used.

As the outputs from the data analysis were emerging, they were being fed back to the interview participants and the tool made it easy for the researcher to locate the specific codes or categories that required reviewing. A data analysis tool, according to Miles and Huberman (1994), helps with coding, editing, content analysis, data linking and drawing conclusions. Smyth (2006) adds that relational networks, that a data analysis tool supports, facilitates the making of meaning and development of models as the "structure of the data unfolds" (Smyth 2006, p. 137). These considerations were true of the present study because the qualitative data analytical tool provided a consistent way of handling and interpreting the data, thus enhancing the dependability of the findings presented in this chapter.

5.12.4 Confirmability

The researcher has acknowledged prior knowledge of the research setting, having had experience of working in the research location. This foreknowledge made it easy to understand why, as directed by the gatekeeper, it was not possible to engage in data collection by observing the information workers and ensuring minimal intrusion – due to the sensitive nature of the data that the information workers handle. It also provided a better understanding of the work context of the information workers.

However, to mitigate any potential biases on the interpretation of the findings, there is a detailed methodological description of the research process in chapter 4 which includes the final respondent validation exercise, the findings of which are reported in chapter 7. The researcher was also able to reflect upon data analytical decisions in a private reflexive diary which helped the researcher maintain focus and adhere to the methodology, and uphold the research participants' affective, cognitive and behavioural experiences as constructs of their reality.

Finally, the ethical principles of avoiding misrepresentation, protecting participants' interests, and securing informed consent were strictly adhered to even when the findings were emerging which were a combination of the participants' words and the meanings made by the researcher's interpretations of the participant's messages.

5.13 Summary

This chapter has presented the categories of information behaviour, together with evidence from the interview transcripts, which are the necessary ingredients for moving towards the development of a model of information behaviour of an information provider.

The findings show that, for an information provider, a hierarchical relationship between low and high level information behaviours is emerging with categories which exist, but are disparate, in LIS literature and other disciplines such as psychology, economics and, communications and management. For information providers, we are beginning to understand the information behaviours that take place beyond the seeking stage such as information production and information dissemination as they interact with multitasking and collaborative information behaviour as well as the feelings and the information workers' perceptions of the effects of their information behaviour. In addition, it is apparent that a model of information behaviour of an information provider suitable for the present study's context is non-linear because information workers have different roles and do not necessarily move from one form of information behaviour to the next as information flows and gathers value through the organisation.

Numerous significant statements, which are excerpts from the interview transcripts, are provided as supporting evidence for the emergence of the categories of information behaviour. Finally, it is argued that the findings are sufficiently robust and trustworthy in the domains of truth value, applicability, consistency and neutrality.

CHAPTER 6: Findings of the Quantitative Phase

6.1 Introduction

This chapter presents the results of the analysis of the questionnaire survey that the entire population of information workers was invited to participate in. Descriptive statistics pertaining to the population as well as the responses to the survey questions are presented to help put the characteristics of the information workers into context. Findings of the analyses to determine any demographic associations with information behaviour are also presented. In a similar way as explained in chapter 5, arguments are proffered that support the robustness and rigour of the quantitative findings.

6.2 Participant demographics

The response rate to the questionnaire survey was 86.4% (that is, 70 responses out of a total population of 81). The dataset for the 70 responses was complete because the questions were mandatory.

Figure 6.1 below shows the percentage distribution of male to female responses to the questionnaire.
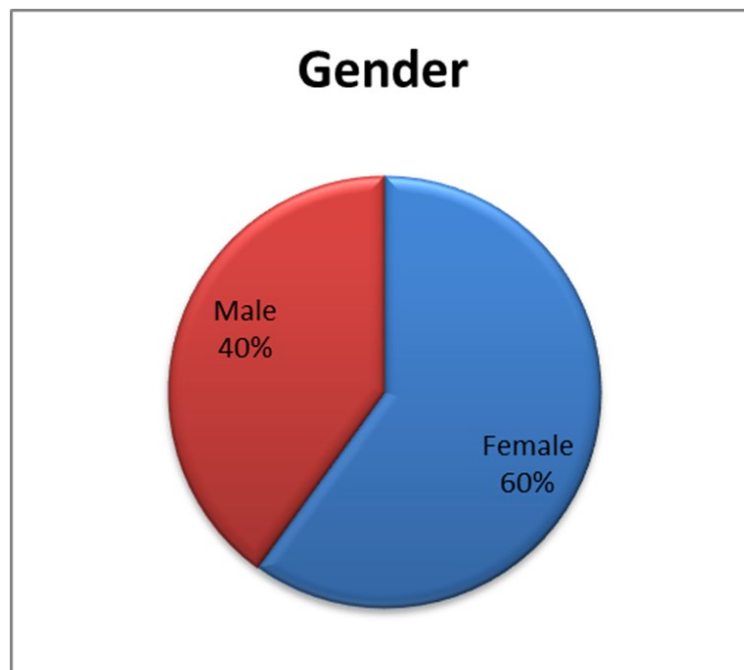
Figure 6.1 Percentage responses to the survey by gender

60% of the 70 survey responses were from females and 40% from males and this reflects the female-male ratio in the population in ISD.

Figure 6.2 below shows percentage responses from the 70 information workers according to their number of years of service.

Years of service

(≤ 1 yr 8%, 2 yrs 7%, 3 yrs 7%, 4 yrs 8%, 5 yrs 13%, 6 yrs 14%, 7 yrs 9%, 8 yrs 9%, 9 yrs 6%, ≥10 yrs 19%)
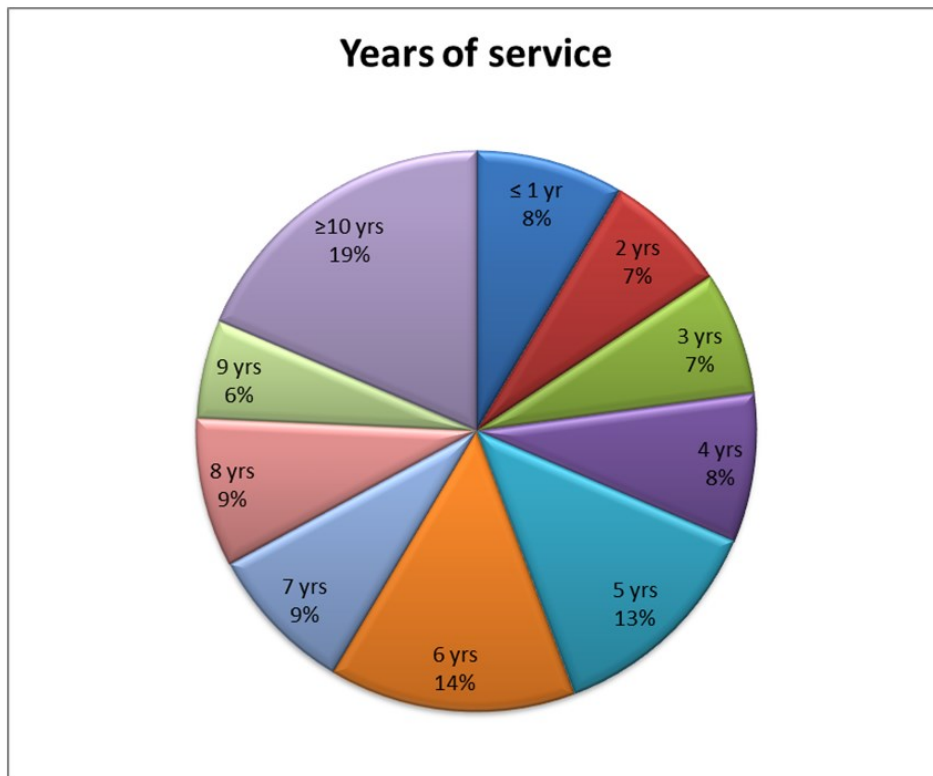
Figure 6.2 Percentage responses to the survey by years of service

In figure 6.2, from the 70 responses, the majority of information workers (19%) had 10 or more years of service in an information intensive environment. With the exception of information workers with 5 and 6 years of service, this was more than twice the percentage of information workers in each of the other categories of years of service as shown in figure 6.2. The lowest percentage of information workers (6%) belonged to those who had 9 years of service. However, there was a wide distribution of information workers' years of service with almost half (46%) the number of information workers having 5, 6 and greater than 10 years of service.

Figure 6.3 below shows the percentage responses from the 5 work areas.
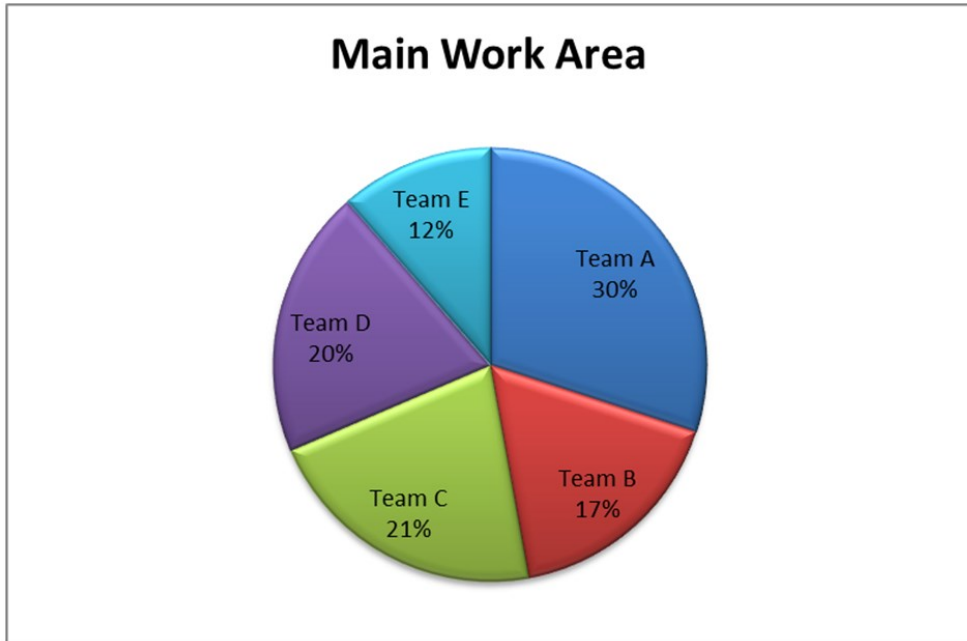
Main Work Area

Figure 6.3 Percentage responses to the survey by main work area

In figure 6.3, 30% of the 70 responses belonged to the Team A work area whereas, the lowest percentage responses (12%) were from Team E. This was not surprising as the entire population of Team A is the highest with 25 information workers and that of Team E is the lowest with 9 information workers. As shown in section 4.2.2, the teams comprise clusters of work areas that perform similar functions. Information workers in Team A engage mostly in production and dissemination activities, whereas for Team B it is acquisition and production activities, for Team C it is acquisition and dissemination activities, for Team D it is production and dissemination activities, and for Team E it is acquisition and production activities.

Figure 6.4 below shows the percentage responses by age group.
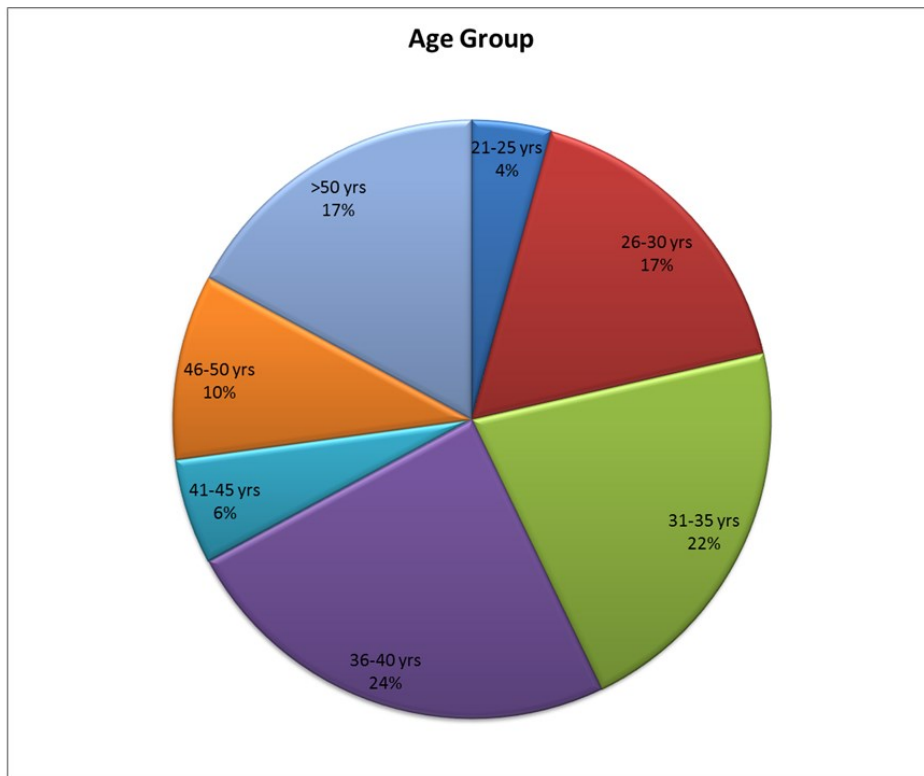
Figure 6.4 Percentage responses to the survey by main work area

In figure 6.4, the age group with the highest percentage of information workers is the 36-40 year old group with 24% whereas the group with the lowest percentage of information workers is the 21-25 year old group. There is no one under the age of 21 and for those over 50 years of age, the cells have been collapsed, due to small numbers, to form one group of >50 year olds.

6.3 Exploring the questionnaire survey responses

Throughout this section, there is reference to each of the questions in the questionnaire used during the quantitative phase of the study. A copy of the questionnaire is in appendix 6.

Table 6.1 below shows the numbers of responses to each item in question 1 on the 4-point rating scale. It is evident that the customers that trigger information behaviours of information workers most of the time are healthcare providers, Scottish Government, and colleagues within the organisation. This is consistent with qualitative findings as illustrated in figure 5.4.

Table 6.1 Survey response frequencies for question 1

Customer	Never	Hardly ever	Some of the time	Most of the time
Patients (health service users) as customers	51	17	1	1
Healthcare providers as customers	2	1	11	56
Local authorities as customers	17	20	29	4
Scottish Government as customer	0	4	34	32
Private sector organisations as customers	19	28	22	1
Researchers/Universities as customers	5	33	28	4
Voluntary organisations as customers	26	28	16	0
Professional bodies (e.g. Royal colleges) as customers	13	29	26	2
IT/Systems developers as customers	27	13	27	3
The media as customers	21	21	24	4
General public as customers	20	33	15	2
Other national agencies as customers	14	37	19	0
Colleagues as customers	1	3	41	25

With regard to the questionnaire item, patients (health service users) in table 6.1 above, most of the respondents (56 out of 70) indicated that patients were never customers of the information with which they interacted. This finding is consistent with the fact that ISD is an organisation that does not provide direct care for patients and as such is reflected in the most frequent type of customers they interact with. The main customers of ISD's information service are those that use information to make decisions that ultimately affect patients rather than the patients themselves.

In table 6.2 below, the numbers of responses to each item in questions 2 and 3 on the 4-point rating scale are shown. For question 2 on information acquisition behaviours, with the exception of information encountering, there was widespread agreement in the population of information workers that they engaged in all information acquisition behaviours either some of the time or most of the time. For information encountering, 40 out of the 70 respondents indicated that they either never or hardly ever experienced information encountering.

Table 6.2 Survey response frequencies for questions 2 and 3

Behaviour	Never	Hardly ever	Some of the time	Most of the time
Browsing internet while acquiring info	1	7	48	14
Searching while acquiring info	3	12	41	14
Delegating when acquiring info	3	7	48	12
Capturing when acquiring info	7	18	24	21
Clarifying when acquiring info	0	0	40	30
Consulting when acquiring info	0	1	46	23
Emailing when acquiring info	0	2	24	44
Encountering when acquiring info	1	39	27	3
Figuring out when acquiring info	0	3	52	15
Telephoning when acquiring info	0	14	49	7
In-depth reading when acquiring info	4	21	41	4
Skim reading when acquiring info	2	15	45	8
Retrieving data when acquiring info	1	11	20	38
Scanning the environment when acquiring info	5	27	35	3
Feel encouraged following info acquisition	2	9	45	14
Feel rewarded following info acquisition	2	15	39	14
Feel reassured following info acquisition	1	8	47	14
Feel happy following info acquisition	4	10	48	8
Feeling of togetherness following info acquisition	3	18	45	4
Feel excited following info acquisition	6	29	34	1
Feel relieved following info acquisition	1	15	50	4
Feel proud following info acquisition	3	24	40	3
Feel pleased following info acquisition	1	2	63	4
Feel determined following info acquisition	2	6	49	13
Feel sense of accomplishment following info acquisition	2	2	56	10
Feel confident following info acquisition	2	11	46	11
Feel good following info acquisition	1	10	54	5
Feel satisfied following info acquisition	0	6	56	8
Feel confused following info acquisition	6	23	39	2
Feel uncomfortable following info acquisition	13	36	21	0
Feel overwhelmed following info acquisition	11	30	28	1
Feel hopeless following info acquisition	34	30	6	0
Feel annoyed following info acquisition	9	38	23	0
Feel tired following info acquisition	4	34	31	1
Feel disappointed following info acquisition	8	40	22	0
Feel frustrated following info acquisition	4	20	43	3
Feel anxious following info acquisition	18	35	17	0
Feel worried following info acquisition	17	33	20	0
Feel neutral following info acquisition	7	34	27	2

Also in table 6.2 above, the positive feelings were overwhelmingly experienced some of the time or most of the time. However, 35 out of 70 respondents indicated that they never or hardly ever experience feelings of excitement. For the negative and neutral feelings, most of the information workers either never or hardly ever experienced them. One exception is the negative feelings of frustration which were experienced by 46 out of 70 information workers some or most of the time. This is consistent with the qualitative findings in figure 5.16 that showed feelings of frustration as the highest frequency of mentions during interview. Another exception is feelings of confusion where 41 out of 70 respondents indicated that they experienced such feelings some or most of the time.

Table 6.3 below shows the numbers of responses to each item in question 4 on the 5-point rating scale. There was agreement or neutrality with the items comprising positive perceptions of impact of information acquisition behaviour. In contrast, for the negative perceptions – 'others are blamed' and 'others are deskilled' - most of the information workers disagreed or remained neutral with the two items. This seems to suggest an overall perception of positive impact of their information behaviours on the internal environment of the information provider.

Table 6.3 Survey response frequencies for question 4

Perception	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Processes are improved following info acquisition	0	1	12	52	5
Reputation is enhanced following info acquisition	0	1	20	41	8
Lessons are learnt following info acquisition	1	1	9	53	6
Policy makers are influenced following info acquisition	0	6	28	33	3
Staff are motivated following info acquisition	0	4	33	32	1
Good relationships are established following info acquisition	0	1	13	52	4
Info sharing culture established following info acquisition	0	5	15	47	3
Others are blamed following info acquisition	11	37	13	9	0
Others are deskilled following info acquisition	10	21	29	10	0

In table 6.4 below, the numbers of responses to each item in questions 5 and 6 on the 4-point rating scale are shown. It is apparent that the overwhelming majority of information workers responded that they experienced information production behaviour some of the time or most of the time, with 'checking' receiving the highest responses (70 out of 70 respondents) as being experienced some or most of the time. This is consistent with the qualitative findings in figure 5.8 where checking was cited most frequently in interviews. One exception is 'transforming' which was not consistent with the interview data in figure 5.8. During interviews, 'transforming' had the second most frequent mentions from 9 participants; but the survey findings showed that 36 out of 70 respondents either never or hardly ever experienced transforming information behaviours. One possible explanation is that, because it was the team leaders who were being interviewed, they had a higher chance of engaging in these information behaviours than most of their team members who probably never engaged in these information behaviours and who formed the majority of the responses to the questionnaire survey.

Table 6.4 Survey response frequencies for questions 5 and 6

Behaviour	Never	Hardly ever	Some of the time	Most of the time
Analysing data when producing info	2	18	38	12
Checking when producing info	0	0	29	41
Comparing when producing info	0	5	40	25
Formatting when producing info	0	7	47	16
Integrating when producing info	1	8	42	19
Separating when producing info	0	7	43	20
Refining when producing info	0	9	43	18
Interpreting when producing info	2	7	50	11
Manipulating data when producing info	2	22	33	13
Writing/preparing reports when producing info	1	9	44	16
Securing data/info when producing info	1	8	32	29
Storing data/info when producing info	1	9	36	24
Transforming when producing info	12	24	27	7
Feel encouraged following info production	0	6	52	12
Feel rewarded following info production	0	13	47	10
Feel reassured following info production	0	9	49	12
Feel happy following info production	1	14	48	7
Feeling of togetherness following info production	1	20	43	6
Feel excited following info production	4	26	36	4
Feel relieved following info production	0	20	46	4
Feel proud following info production	0	26	37	7
Feel pleased following info production	0	8	56	6
Feel determined following info production	0	8	53	9
Feel sense of accomplishment following info production	0	3	58	9
Feel confident following info production	1	4	55	10
Feel good following info production	1	10	51	8
Feel satisfied following info production	0	7	53	10
Feel confused following info production	8	38	23	1
Feel uncomfortable following info production	21	40	9	0
Feel overwhelmed following info production	17	38	15	0
Feel hopeless following info production	35	33	2	0
Feel annoyed following info production	17	34	18	1
Feel tired following info production	4	45	21	0
Feel disappointed following info production	11	46	13	0
Feel frustrated following info production	8	28	33	1
Feel anxious following info production	21	40	9	0
Feel worried following info production	21	43	6	0
Feel neutral following info production	10	37	19	4

Also in table 6.4 above, the positive feelings were experienced by the majority of the respondents some or most of the time. At the same time, all the negative and neutral feelings were never or hardly ever experienced by the majority of the respondents. This suggests that the overwhelming majority of respondents were positive in their feelings following their experience of information production behaviour.

Table 6.5 below shows the numbers of responses to each item in question 7 on the 5-point rating scale.

Table 6.5 Survey response frequencies for question 7

Perception	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Processes are improved following info production	0	2	8	54	6
Reputation is enhanced following info production	0	1	9	55	5
Lessons are learnt following info production	0	3	8	52	7
Policy makers are influenced following info production	1	6	31	29	3
Staff are motivated following info production	0	3	29	35	3
Good relationships are established following info production	0	1	12	49	8
Info sharing culture established following info production	1	4	12	48	5
Others are blamed following info production	14	34	12	9	1
Others are deskilled following info production	11	26	24	9	0

As shown in table 6.5 above, the majority of the respondents agreed or strongly agreed with the perception of positive impacts of their information production behaviour on the internal environment of the organisation. For the negative impacts – 'others are blamed following information production' and 'others are deskilled following information production' – the majority of the respondents disagreed or strongly disagreed with such perceptions. This suggests that the respondents perceive their information disseminating behaviour subtypes as having a positive impact on the organisation's internal environment.

Table 6.6 below shows the numbers of responses to each item in questions 8 and 9 on the 4-point rating scale.

Table 6.6 Survey response frequencies for questions 8 and 9

Behaviour	Never	Hardly ever	Some of the time	Most of the time
Cascading when disseminating info	4	12	43	11
Publishing online when disseminating info	11	7	40	12
Presenting formally when disseminating	8	28	29	5
Presenting informally when disseminating	1	10	46	13
Transmitting when disseminating	2	30	38	0
Feel encouraged following info dissemination	3	8	48	11
Feel rewarded following info dissemination	2	14	46	8
Feel reassured following info dissemination	2	11	47	10
Feel happy following info dissemination	3	9	48	10
Feeling of togetherness following info dissemination	2	20	41	7
Feel excited following info dissemination	6	25	35	4
Feel relieved following info dissemination	2	19	43	6
Feel proud following info dissemination	3	16	45	6
Feel pleased following info dissemination	1	6	53	10
Feel determined following info dissemination	3	12	40	15
Feel sense of accomplishment following info dissemination	1	4	48	17
Feel confident following info dissemination	2	5	51	12
Feel good following info dissemination	3	8	47	12
Feel satisfied following info dissemination	1	4	50	15
Feel confused following info dissemination	19	33	17	1
Feel uncomfortable following info dissemination	26	26	18	0
Feel overwhelmed following info dissemination	26	32	11	1
Feel hopeless following info dissemination	37	31	2	0
Feel annoyed following info dissemination	23	32	15	0
Feel tired following info dissemination	14	34	22	0
Feel disappointed following info dissemination	23	38	9	0
Feel frustrated following info dissemination	19	25	26	0
Feel anxious following info dissemination	28	30	11	1
Feel worried following info dissemination	31	32	7	0
Feel neutral following info dissemination	18	30	21	1

As shown in table 6.6 above, the majority of the respondents engage in the information disseminating behaviour subtypes some of the time and most of the time. The only exception is presenting information formally where 36 respondents hardly ever or never engaged in this behaviour compared to 34 who engaged in this behaviour some of the time or most of the time. This is attributable to the fact that, within teams in ISD, not every member engages in all the information behaviour subtypes that are necessary for delivering the information outputs of that team, thus lending support to the non-linear nature of the model of information behaviour of ISD.

The feelings responses in table 6.6 show that the majority of the respondents experience positive feelings some or most of the time following information dissemination. In addition, the majority of the respondents never or hardly ever experience neutral and negative feelings following information dissemination behaviours, thus suggesting a generally positive outcome when they engage in information dissemination behaviours.

Table 6.7 below shows the numbers of responses to each item in question 10 on the 5-point rating scale.

Table 6.7 Survey response frequencies for question 10

Perception	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Processes are improved following info dissemination	0	1	17	44	8
Reputation is enhanced following info dissemination	0	2	17	40	11
Lessons are learnt following info dissemination	0	4	11	48	7
Policy makers are influenced following info dissemination	0	5	26	34	5
Staff are motivated following info dissemination	0	4	19	43	4
Good relationships are established following info dissemination	0	2	8	50	10
Info sharing culture established following info dissemination	1	2	13	41	13
Others are blamed following info dissemination	16	29	19	6	0
Others are deskilled following info dissemination	14	25	22	8	1

In table 6.7 above, the majority of respondents agree or strongly agree with the perceptions of positive impact of information dissemination behaviour subtypes on the internal environment of the organisation. On the other hand, the majority of respondents disagree or strongly disagree with the 2 negative impacts - 'others are blamed following information production' and 'others are deskilled following information production' - of information dissemination behaviour on the organisation's internal environment. Only 6 and 9 respondents respectively agree that others are blamed and others are deskilled as a result of disseminating information. This suggests that the perceptions of negative impact are very rare in ISD and the overwhelming majority of respondents perceive their information disseminating behaviour subtypes as having a positive impact on the organisation's internal environment.

Table 6.8 below shows the numbers of responses to each item in question 11 on the 4-point rating scale.

Table 6.8 Survey response frequencies for question 11

Behaviour	Never	Hardly ever	Some of the time	Most of the time
Multitasking (concurrent) activities	2	13	41	14
Multitasking (sequential) activities	0	3	31	36
Collaborating with peers	0	2	37	31
Collaborating with specialists or experts	2	15	43	10
Collaborating as part of work process	0	4	51	15

As shown in table 6.8 above, The 2 subtypes of multitasking information behaviour are experienced by the majority of information workers some or most of the time. Likewise, the 3 subtypes of collaborative information behaviour are experienced by the majority of information workers some or most of the time.

The free text responses for comments in the questionnaire did not capture any data of significance that would have required altering the structure or content of the questionnaire. The comments mainly tried to provide an explanation of why a neutral response box was checked or why the respondent indicated that they never experienced a subtype of information behaviour. Although only 11 respondents used the free text comments box, the statements mostly implied who the respondents were and so had to be deleted and could not be included in the present study. Some of the statements alluded to the fact that the survey questions made a lot of sense, the purpose of the study seemed interesting and that it was appropriate that the rating scale was not identical throughout the entire survey. The neutral feelings across all the core information behaviours of acquisition, production and dissemination, which were not identified at interview but included in the survey as explained in section 4.6.1.2, are shown in tables 6.2, 6.4 and 6.6 as never or hardly ever experienced by the majority of respondents and are further explored on returning to the participants in chapter 7.

6.4 Demographic associations with information behaviour

To determine whether there is an association between two categorical variables, the Pearson's Chi-square test can be used; and for associations between three or more categorical variables, loglinear analysis can be done (Field 2009). However, when a cell in a 2x2 contingency table has a value less than 5, or greater than 20% of the cells in a larger table have values less than 5, the assumptions of the chi-square test are violated resulting in lack of statistical power and, in such circumstances, Fisher's exact test is recommended (Fisher 1922).

In the present study, due to a small population of 81 out of which there were 70 responses to the survey questionnaire, Pearson's Chi-square tests and, where the assumptions of Chi-square tests were violated, Fisher's exact tests were done. It was not possible to carry out loglinear analysis to determine the effects to multiple demographic variables on information behaviour variables because the cell values would be too small, thereby resulting in loss of statistical power. Even adding a constant to each cell value, according to Field (2009), does not address the issue of lack of statistical power.

For the purposes of the statistical analyses, research questions 2a, 2b, 2c, and 2d (i.e. RQ2a, RQ2b, RQ2c and RQ2d), as described in chapter 3, are reduced to the following null hypotheses:

H_o (RQ2a) = There is no age difference in information behaviour of information workers

H_o (RQ2b) = There is no gender difference in information behaviour of information workers

H_o (RQ2c) = There is no work experience difference in information behaviour of information workers

H_o (RQ2d) = There is no work role difference in information behaviour of information workers

However, because 'information behaviour' in the present study has been shown to comprise several sub-categories within each of information acquisition behaviour, information production behaviour, information dissemination behaviour, multitasking information behaviour and collaborative information behaviour, it was necessary to test each of the categorical variables of age, gender, work experience and work role (main work area), in turn, against each of the sub-categories (variables) of information behaviour. The variables used for testing associations against age, gender, work experience and work role (main work area) are shown in table 6.9 below.

Table 6.9 Information behaviour variables used in statistical tests

Information behaviour variables used in statistical tests
Browsing internet while acquiring info
Searching while acquiring info
Delegating when acquiring info
Capturing when acquiring info
Clarifying when acquiring info
Consulting when acquiring info
Emailing when acquiring info
Encountering when acquiring info
Figuring out when acquiring info
Telephoning when acquiring info
In-depth reading when acquiring info
Skim reading when acquiring info
Retrieving data when acquiring info
Scanning the environment when acquiring info
Analysing data when producing info
Checking when producing info
Comparing when producing info
Formatting when producing info
Integrating when producing info
Separating when producing info
Refining when producing info
Interpreting when producing info
Manipulating data when producing info
Writing/preparing reports when producing info
Securing data/info when producing info
Storing data/info when producing info
Transforming when producing info
Cascading when disseminating info
Publishing online when disseminating info
Presenting formally when disseminating
Presenting informally when disseminating
Transmitting when disseminating
Multitasking (concurrent)
Multitasking (sequential)
Collaborating with peers
Collaborating with specialists or experts
Collaborating as part of work process

For illustrative purposes, the statistical outputs of the tests of the gender demographic variable against three of the information behaviour variables from table 6.9 with which there are associations are shown in appendix 14. Gender was randomly chosen out of the other three demographic variables to illustrate a typical statistical output. Gender, in addition to each of the other demographic variables, was tested against each of the 37 variables in table 6.9 and the statistical outputs ran to just over 50 pages. A pragmatic decision was therefore taken to include, in appendix 14, only an extract of the statistical output rather than the entire 50-page output but show a summary of the outputs of all the statistical tests in appendix 15.

In appendix 14, the contingency tables are 2x2 with the 2 rows depicting male and female gender and the 2 columns depicting the collapsed cells 'never/hardly ever' and 'some/most of the time'. Although not shown because the outputs are even lengthier than those for gender, there are 10x2 contingency tables for 'work experience (years of service)', 5x2 contingency tables for 'work role (main work area)', and 7x2 contingency tables for 'age group' as statistical outputs for the analyses on which complex chi-square and Fisher's Exact tests were done. Chi-square tests (and Fisher's Exact tests) do have limitations. While they are sufficient for the purposes of the research questions in the present study, they are limited to revealing only whether an association between variables exist. They cannot reveal the nature of the association – that is, breaking down the chi-square statistic to determine the error between what the statistical model of independence predicts and the observed data – neither can they predict the strength of the association between the variables. Standardised residuals are used to determine the nature of the association. Symmetric measures such as Phi, Cramer's V and Contingency Coefficient are used to determine the strength of the association. They are not used in the present study to investigate associations but are shown within the outputs in appendix 14 for the gender variable because they are part of the standard outputs from the statistical software used to run the tests.

6.4.1 Gender difference in information behaviour

The statistical outputs, presented in appendix 14 and summarised in appendix 15, show the following associations (χ^2 = *chi-square; (1) = 1 degree of freedom*):

- There was evidence of an association between gender and 'in-depth reading when acquiring information': χ^2 *(1) = 9.33, p < .01 (2-sided)*.

- There was evidence of an association between gender and 'securing data/information when producing information': *Fisher's Exact p < .05 (2-sided)*.

- There was evidence of an association between gender and 'collaborating with specialists or experts': χ^2 *(1) = 5.71, p < .05 (2-sided)*

Therefore, the statistical data were able to provide evidence for rejecting the null hypothesis, H_o (RQ2b), only with regard to associations between gender and each of 'in-depth reading', 'securing data/information' and 'collaborating with specialists or experts' when acquiring information. The data failed to reject the null hypothesis with regard to associations between gender and the remainder of the information behaviour variables which are all listed in table 6.9.

In being unable to find evidence for an alternative hypothesis of associations between gender and the rest of the information behaviour variables, Laroche et al (2000), as explained in chapter 2, provide a perspective when they argue that there is increasing blurring of gender roles. Urquhart and Yeoman (2010) also proffer another explanation when they indicate that samples need to be very large in order to reveal gender differences in information behaviour. Either of these arguments is a possible explanation for failing to reject the null hypothesis for the 34 other information behaviour variables. However, a larger sample size would have provided some insights for supporting or rejecting Laroche et al's (2000) arguments.

6.4.2 Age difference in information behaviour

As shown in appendix 15, the statistical outputs for the cases of age group and each of the 37 variables in table 6.9 showed the following associations:

- There was evidence of an association between age group and 'searching while acquiring information': *Fisher's Exact = 12.246, p < .05 (2-sided)*

- There was evidence of an association between age group and 'in-depth reading when acquiring information': *Fisher's Exact = 13.210, p < .05 (2-sided)*

- There was evidence of an association between age group and 'skim-reading when acquiring information': *Fisher's Exact = 15.090, p < .01 (2-sided)*

- There was strong evidence of an association between age group and 'presenting formally when disseminating information': *Fisher's Exact = 22.973, p < .001 (2-sided)*

- There was evidence of an association between age group and 'presenting informally when disseminating information': *Fisher's Exact = 11.506, p < .05 (2-sided)*

- There was evidence of an association between age group and 'collaborating with specialists or experts': *Fisher's Exact = 16.657, p < .01 (2-sided)*

Therefore, the statistical data were able provide evidence for rejecting the null hypothesis, H_o (RQ2a), only with regard to associations between age group and each of 'searching while acquiring information', 'in-depth reading when acquiring information', 'skim-reading

when acquiring information' 'presenting formally when disseminating information', 'presenting informally when disseminating information', and 'collaborating with specialists or experts'. The data failed to reject the null hypothesis with regard to associations between age group and the remainder of the information behaviour variables which are all listed in table 6.9.

The study of information search skills across all student age groups from 17 year-olds to the over sixties, presented in Tenopir and Rowlands (2007), showed that older students found searching more important, and were more proficient in searching, than the younger students; and in particular the under 40s relied more on recommended readings from others. Shenton and Dixon (2003a, b) also added weight to the theory that younger people used other people as an information seeking method. The literature therefore suggests an association between reading behaviours and age, and collaborative behaviours and age, which the findings in the present study also provide evidence for.

6.4.3 Work experience difference in information behaviour

As shown in appendix 15, the statistical outputs for the cases of 'years of service' and each of the 37 variables in table 6.9 showed the following associations:

- There was evidence of an association between 'years of service in the department' and 'telephoning when acquiring information': *Fisher's Exact = 13.845, p < .05 (2-sided)*

- There was evidence of an association between 'years of service in the department' and 'publishing online when disseminating information': *Fisher's Exact = 17.220, p < .05 (2-sided)*

- There was evidence of an association between 'years of service in the department' and 'collaborating with peers': *Fisher's Exact = 12.103, p < .05 (2-sided)*

Therefore, the statistical data were able to provide evidence for rejecting the null hypothesis, H_o (RQ2c), only with regard to associations between 'years of service in the department' and each of 'telephoning when acquiring information', 'publishing online when disseminating information', and 'collaborating with peers'. The data failed to reject the null hypothesis with regard to associations between 'years of service in the department' and the remainder of the information behaviour variables which are all listed in table 6.9.

Kuhlthau's study of early career information workers (Kuhlthau 1999) presented evidence that information workers with more work experience tended to be able to handle better the processes related to information seeking such as making decisions and coping with uncertainty and complexity. The present study adds to that evidence by indications of associations between work experience and some of the information behaviours listed in table 6.9.

6.4.4 Work role (main work area) differences in information behaviour

As shown in appendix 15, the statistical outputs for the cases of 'main work area' and each of the 37 variables in table 6.9 showed the following associations:

- There was evidence of an association between 'main work area' and 'searching when acquiring information': *Fisher's Exact = 12.121, p < .01 (2-sided)*

- There was evidence of an association between 'main work area' and 'information encountering when acquiring information': *Fisher's Exact = 19.105, p < .01 (2-sided)*

- There was evidence of an association between 'main work area' and 'in-depth reading when acquiring information': *Fisher's Exact = 13.073, p < .01 (2-sided)*

- There was evidence of an association between 'main work area' and 'integrating when producing information': *Fisher's Exact = 8.715, p < .05 (2-sided)*

- There was strong evidence of an association between 'main work area' and 'refining when producing information': *Fisher's Exact = 15.369, p < .001 (2-sided)*

- There was evidence of an association between 'main work area' and 'manipulating data when producing information': *Fisher's Exact = 9.706, p < .05 (2-sided)*

- There was evidence of an association between 'main work area' and 'securing data/info when producing information': *Fisher's Exact = 14.260, p < .01 (2-sided)*

- There was evidence of an association between 'main work area' and 'presenting formally when disseminating information': *Fisher's Exact = 10.555, p < .05 (2-sided)*

Therefore, the statistical data were able to provide evidence for rejecting the null hypothesis, H_o (RQ2d), only with regard to associations between 'main work area' and each of 'searching when acquiring information', 'information encountering when acquiring information', 'in-depth reading when acquiring information', 'integrating when producing information', 'refining when producing information', 'manipulating data when producing information', 'securing data/info when producing information' and 'presenting formally when disseminating information'. The data failed to reject the null hypothesis with regard to associations between main work area and the remainder of the information behaviour variables which are all listed in table 6.9.

Given that the teams to which the information workers belong differ in job functions and work roles with regard to their interactions with information, then it is inevitable that there may exist some associations between work area and some of the information behaviours listed in table 6.9 as the present study's findings have shown. This was shown to be the case in Leckie, Pettigrew and Sylvain's (1996) model of information seeking behaviour of professionals and, as reviewed in chapter 2, Landry's (2000) study of work role influences of information behaviour of dentists and Niu and Hemminger's (2012) findings that academic position influences information seeking behaviour. Allied to this is the role of culture where, as Peel (2011) posits, information practices diverge between individuals, groups of individuals and disciplines and goes on to add that "individuals and individual communities of interest are likely to have their own idiosyncratic patterns of information seeking behaviours, their own constructions of wisdom, and their own decision making values and cultures (Peel 2011, p. 3). The present study adds to this evidence by indications of associations between main work area and some of the information behaviours listed in table 6.9.

6.5 Robustness of quantitative research phase

In chapter 4, the present study's framework for research quality and rigour was presented in section 4.4.2. This section describes the evidence that supports the framework with regard to the quantitative phase. As shown in table 4.4, the research quality and rigour indicators for the quantitative phase are internal validity, external validity, reliability and objectivity. Each one is addressed in turn in the subsections that follow.

6.5.1 Internal validity

The internal validity is robust because the entire population of 81 was surveyed and, out of the 70 responses, each of the 5 teams in the population had representation that exceeded 82% as shown in table 6.10 below. Internal validity is given higher prominence and consideration in studies where the aim is to establish cause and effect. As the

present study is more exploratory and descriptive than explanatory, the relevance of internal validity is therefore low.

Table 6.10 Responses to the survey questionnaire by team

Team	Population	Responses
A	25	21 (84.0%)
B	14	12 (85.7%)
C	16	15 (93.8%)
D	17	14 (82.4%)
E	9	8 (88.9%)
TOTAL	81	70 (86.4%)

6.5.2 External validity

With the study being a census survey, the results could be generalised to the population of information workers in the study location. However, the results could not be generalised to information workers in other contexts. The findings could nevertheless be tested in other contexts to determine their transferability and this can be facilitated with the detailed description of the research setting and characteristics of the information workers presented in chapter 4.

The construct validity has been demonstrated by the conceptually distinct scales and their items in the questionnaire which were shown to be robust by the findings of the content validity index (CVI) of 1.00 as shown in appendix 9.

6.5.3 Reliability

To demonstrate reliability of the scale, Cronbach's alpha, α, is applied, in turn, to each of the scales, and sub-scales where present, in the questionnaire to determine the degree of consistency of the questionnaire (Field 2009).

Cronbach's alpha reliability analysis was carried out for each of the first 11 questions in the questionnaire (see full questionnaire in appendix 6) broken down into their various subscales. It was not necessary to include the demographic variables in questions 12-15 because they are individual scales that must remain in order to answer the research questions. Field (2009) suggested that, in addition to checking the values in the item-total statistics table shown in appendix 16, the most important result, the α values, should be in the region of .7 and above; although Kline (1999) argues that values lower than .7 can be acceptable in some social science data due to the diversity of constructs. The statistical

outputs are shown in appendix 16 and the key values are summarised in table 6.11 below.

Table 6.11 Reliability statistics

Question	Scale	Subscale	Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	Number of Items
1	Customers	Subtype	.754	.752	13
2	Information acquisition behaviour	Subtype	.773	.802	14
3	Information acquisition behaviour	Positive feelings	.886	.887	14
3	Information acquisition behaviour	Negative feelings	.888	.888	10
4	Information acquisition behaviour	Perceived positive impact	.768	.772	7
4	Information acquisition behaviour	Perceived negative impact	.697	.697	2
5	Information production behaviour	Subtype	.747	.758	13
6	Information production behaviour	Perceived positive feelings	.909	.912	14
6	Information production behaviour	Perceived negative feelings	.898	.901	10
7	Information production behaviour	Perceived positive impact	.864	.871	7
7	Information production behaviour	Perceived negative impact	.806	.808	2
8	Information dissemination behaviour	Subtype	.722	.739	5
9	Information dissemination behaviour	Perceived positive feelings	.949	.950	14
9	Information dissemination behaviour	Perceived negative feelings	.943	.944	10
10	Information dissemination behaviour	Perceived positive impact	.898	.900	7
10	Information dissemination behaviour	Perceived negative impact	.871	.873	2
11	Associated behaviours	Multitasking information behaviour	.748	.757	2
11	Associated behaviours	Collaborative info behaviour	.745	.749	3

As shown in table 6.11, the α values were all within acceptable limits which suggests that there is internal consistency reliability.

6.5.4 Objectivity

There was adequate distance between the researcher and the research subjects because informed consent was obtained prior to, and during, data collection, permission was sought from the gatekeeper to access the research subjects, and there was a review of all the ethical considerations as discussed in chapter 4. In addition, the research subjects were able to complete the self-report questionnaire, in their own time, anonymously and voluntarily and there was complete respect for their privacy during all stages of the research process. Therefore the quantitative phase of the study has maintained objectivity.

6.6 Summary

This chapter has presented the findings of the statistical analysis of the survey data. The response rate to the survey was very good and there were no gaps in the dataset. This enabled an accurate descriptive statistical analysis of the 70 respondents using frequencies and percentages. There was very good respondent representation from each of the 5 team work areas.

The response frequencies for each of the questions on the scales were thoroughly discussed and there were marked similarities with the qualitative interview findings. Research question 2 was translated to the language of hypothesis testing in order to determine whether the null hypotheses were rejected and alternative hypotheses accepted. However, because the term information behaviour comprises a number of subtypes, associations between each of the demographic variables and a small number of the information behaviour subtypes were found to exist. Therefore none of the 4 null hypotheses could be rejected entirely.

The quantitative research was found to be robust in terms of internal and external validity, reliability and objectivity, thus providing credence to the findings.

CHAPTER 7: Developing the Model

7.1 Introduction

The purpose of this chapter is to present the third phase of the research, as depicted in figures 4.3 and 4.4, which led to the co-creation of a model of information behaviour of the information provider.

The chapter commences with an explanation of how the draft visual model of information behaviour of the information provider was developed using the findings presented in chapters 5 and 6. The content and format of the respondent validation workshops, described in section 4.7, are then presented, as well as with the feedback from the workshop participants who were co-creators of the final model of information behaviour.

The final model of information behaviour, which is a product of the outputs of the respondent validation workshops, is described and presented as a group of 3 diagrams in section 7.4.

7.2 Developing the draft model

The draft model of information behaviour of the information provider was developed by synthesising the findings in chapters 5 and 6. With there being so much congruence between the interview and survey findings as highlighted in chapter 6, it was possible for the researcher to determine the main elements of both findings. The key elements that emerged from the findings and therefore depicted in the draft model of information behaviour are the:

- Information value chain comprising value-added information activities that facilitate the flow of information within the organisation
- Internal and external customers of information which serve as triggers of information behaviour. These are presented in chapters 5 and 6.
- Sources of information. These are presented in chapters 5 and 6
- Core information behaviours (i.e. acquisition, production and dissemination) defined in chapter 5
- Associated information behaviours (i.e. multitasking and collaborative) which occur as information workers engage in core information behaviours and defined in chapter 5
- Feelings as outcomes of information behaviour as presented in chapters 5 and 6

- Perceived internal impact of information behaviour as presented in chapters 5 and 6

- Non-linearity as evidenced by the complex interactions and relationships between the variables described in chapters 5 and 6

With the above 8 key elements of the findings in mind, the draft visual model of information behaviour of the information provider was produced as shown in figure 7.1 below and was supplemented with information on the subtypes of each of the elements depicted in the model. It was important to emphasise that the model was mainly concerned with the internal information environment of the information provider as explained in the scope of the research in chapter 1.

The Internal Information Environment of the Provider
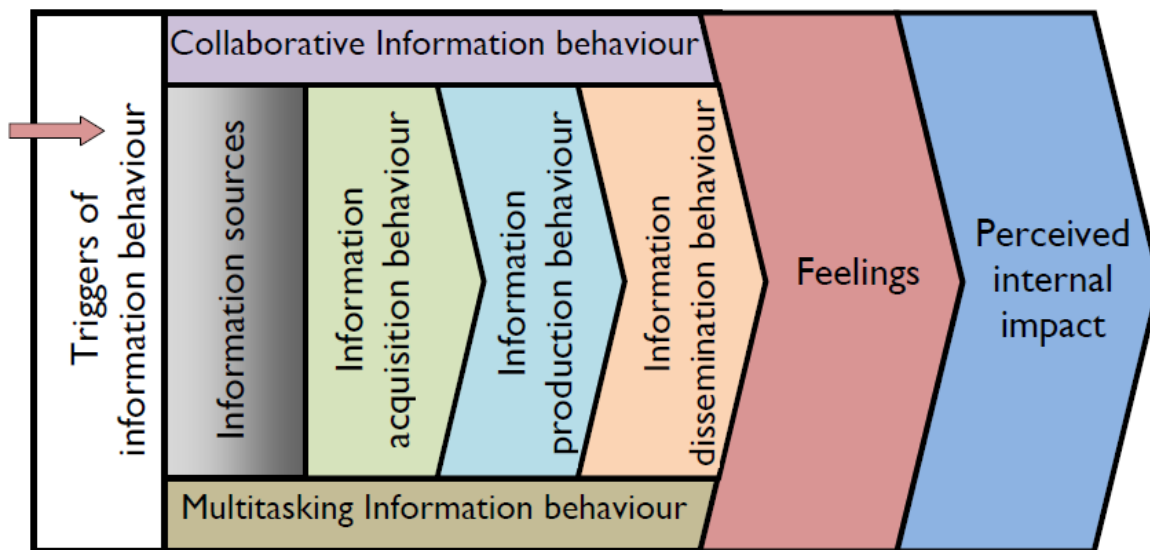
Figure 7.1 Draft model of information behaviour of the information provider

Figure 7.1 shows that, as a result of triggers of information behaviour, information flows within the organisation, gaining value, until it gets to the internal or external customer. Information workers access a range of information sources and engage in a series of core and associated information behaviours – acquisition, production, dissemination, collaborative and multitasking. Figure 7.1 also shows that feelings emerge as outcomes of the information workers' information behaviour. These feelings, which start as workers engage in information behaviour and continue even after the information behaviours, are factors that add to, or diminish, the value of the information provided. Figure 7.1 also shows perceptions of the impact of the information workers' information behaviour on the internal environment of the information provider. These information workers' perceptions represent the information workers' assessments of the long-term effects of their

behaviours which are not only influenced by the feedback they get from customers but also by their personal experiences and assumptions. It is also evident in the draft model that its components point in one direction. This does not depict linearity of information activities, but rather represent flow and value chain of information in the organisation.

With the draft model of information behaviour having been developed, it was added to a presentation that was prepared specifically for the respondent validation workshops so as to form a starting point from which the final model would be developed.

7.3 Facilitating the respondent validation workshops

As explained in section 4.7, in advance of the workshop, the respondent validation workshop participants were given access to the figures, tables and definitions in chapters 5 and 6 that represent the findings of the interviews and survey. This enabled them to prepare and participate actively in the discussions during the workshops.

The purpose of the respondent validation workshops was to establish the credibility of the findings (Guba and Lincoln 1989), co-create a model of information behaviour of the information provider, and thereby meet the requirements of Heideggerian phenomenology informed by Colaizzi (1978). As explained in chapter 4, the workshop was repeated because all 10 participants could not attend the first session.

The workshops were facilitated by the researcher. They began with a reminder about the aim, objectives and benefits of the research. The participants were then given reassurance about the adherence to the ethical standards of informed consent, privacy and confidentiality, voluntary participation and avoidance of deception and misrepresentation. They were then invited to sign informed consent forms, a copy of which is shown in appendix 17. They were thanked for all their contributions that had led to the study progressing successfully through its various stages up to the point of the workshop. A presentation was then delivered as shown in appendix 18. The first presentation slide comprised a list of 7 questions that they would be expected to answer during the workshop. As explained in section 4.7, six of the questions were suggested by Creswell and Miller (2000).

As shown in appendix 18, the 7 questions were:

1. Do the themes and categories make sense?
2. Do you believe they represent your experiences?
3. Which categories or sub-categories would you remove?

4. Which categories or sub-categories would you refine or add?

5. Do you have any comments on the survey results?

6. What would a final model look like?

7. Do you have any general comments?

The main aim of the questions was to stimulate conversation and also provide responses to specific questions which would add value to the final model of information behaviour by ensuring congruency with the views of the interview participants. The purpose of questions 1 and 2 was to ascertain the credibility of the subtypes of information behaviour and the other components of the draft model which were the researcher's interpretations of the participants' experiences of information behaviour. There were sub-questions to questions 1 and 2 that related to specific subcategories of the participants' experiences which, as explained in the findings in chapter 5 and 6, required further exploration during the workshop due their infrequent mentions during interviews or overwhelming disagreement by survey participants. The responses to each sub-question are presented in section 7.4.2.

The purpose of questions 3 and 4 was to invite contributions from the participants so as to ensure that the categories in the draft model were a reflection of their reality and which would therefore enhance the credibility of the components of the draft model, where necessary. The purpose of question 5 was to invite comments from the interview participants about the survey in order to capture any views they may have about their experiences in relation to the wider context of all the information teams in the organisation, and to add value to the final model.

The purpose of question 6 was to ensure that the participants were fully engaged in the co-creation of the final model of information behaviour of the information provider and could offer relevant ideas and opinions that would facilitate the process of model co-creation.

Question 7 contributed to stimulating the conversation in order to capture any relevant feedback from the participants.

The next presentation slide, as shown in appendix 18, comprised a reminder of how the interview participants were recruited and their representativeness so as to refresh their memories of how they became active participants in the research. This slide was followed by an overview of the demographic characteristics of the questionnaire survey participants obtained from chapter 6. This enabled the workshop participants to

understand their input to the study within the context of the entire population of the research location.

The penultimate presentation slide comprised an explanation of the draft model of information behaviour as already described in section 7.2 and the draft visual model as shown in figure 7.1.

The draft model was described to the workshop participants with reference to their information packs which included the descriptions of all the types of information behaviour, the subtypes of all the core and associated information behaviours, as well as the subtypes of customers, sources of information, feelings and perceived internal impact that are shown in chapters 5 and 6. As shown in appendix 18, at the end of the description of the draft model, the workshop participants were reminded about the 7 questions which would serve as the trigger to commencing discussions.

The focus group style of the workshop was not recorded. This strategy eliminated the need to produce "somewhat chaotic" (Kvale and Brinkmann 2009, p. 150) interview transcripts of vivacious discussions and, instead, encouraged the participants to immediately immerse themselves in unguarded discussions which revealed their immediate thoughts and impressions about the draft model and its components and relevance. The participants engaged in collective "spontaneous expressive and emotional views" (Kvale and Brinkmann 2009, p. 150) when compared to the individual interviews where they were alone with the interviewer and had more time to reflect before responding to the questions. On the other hand, the absence of a recording device encouraged the researcher to employ sharpened moderator/facilitator skills while listening actively, drawing every participant into the discussions, writing down salient points, probing individuals where necessary, ensuring that all 7 questions were covered in the discussions, and observing the interactions. There were many opportunities for the researcher to write and observe because there were numerous instances when the participants were not addressing the researcher but instead would be talking to fellow participants who would raise new points of discussion.

It was perhaps the right strategy for not recording the discussions because most of the conversations would have easily revealed the identity of the participants and the individuals they interact with in their daily work environment. If the conversations had been recorded, the recordings would have had to be handled very sensitively and ethically in relation to storage and destruction, and many segments of the transcripts would have had to be redacted. It is also not known how the presence of a recording device would have influenced the immediate and spontaneous flow of candid

conversation at the start of the workshop. The researcher's impressions were that the participants would have been initially guarded in their speech before eventually ignoring the presence of the recording device. This effect may also have existed if an unfamiliar facilitator or note taker were present during the workshop.

With the participants being encouraged to summarise their key contributions on Post-it® Notes, it was possible, at the end of the workshop, to read the contents of their notes and combine them with the personal notes of the researcher. For example one participant wrote "Good for leaning up IRP" on a Post-it® Note. However, the researcher had written down the following salient point during the workshop: "The model can provide enough information for continuous improvement programmes e.g. Lean for handling information requests…". The participant's note effectively conveyed that the model of information behaviour will be good for use in a Lean exercise on the organisation's information request protocol (IRP). The participant's note therefore corroborated the researcher's notes and added value and credibility to the salient point that the researcher had written down during the workshop. Also, as explained in chapter 4, the researcher had previous working experience in the study location and therefore was familiar with the workshop participants' use of acronyms and terminologies.

One of the strengths of the workshop was the issue of safety in numbers. This was the state in which the participants felt relaxed in a safe environment, trusted both the researcher and their fellow colleagues, were motivated by the fact that they had all contributed to the study up to the point of the workshop, could share similar experiences, and had experienced benefits during the individual interviews where they had stated that the interviews made them realise that their work involved many valuable information activities. It was therefore not surprising that little or no effort was required to stimulate conversation.

However, it was surprising that there was unanimous agreement about the value of the model of information behaviour and agreement that it reflected their experiences. The researcher had assumed that, with so many of the interview participants present, there was bound to be a participant who may have had an experience that was not captured effectively and presented as part of the findings. This assumption proved to be unfounded. The more outspoken participants, who would readily challenge a new concept, immediately recognised the value of the model of information behaviour.

At the end of the workshop, the researcher reviewed and added his impressions to his personal notes and, together with the participants' words on their Post-it® Notes, devised the method for presenting the workshop feedback.

7.4 Feedback from workshop participants

This section provides the feedback from the workshops which comprises a combination of the notes taken during and immediately after the workshops and the workshop participants' written words. It was not possible to report, verbatim, all the participants' feedback that they wrote on the Post-it® Notes because most of their comments would not preserve their anonymity. Therefore, in such cases, their comments were paraphrased and phrases that would potentially identify them were removed. However, all words within pairs of double quotation marks in this section are the exact words of the workshop participants.

Although the discussions were unstructured, all the questions were addressed at various stages during the workshop. The informality and unstructured nature of the discussions allowed the participants to talk freely about the relevance of the model to their area of work as well as the organisation as a whole.

The feedback was grouped under 3 headings which are discussed in the subsections that follow – overall impression of the findings in section 7.4.1, categories of information behaviour in section 7.4.2, and value of the model in section 7.4.3. In each of these sections, the feedback is presented in a different way. This reflects the different ways the feedback from the participants was captured.

In section 7.4.1, evidence that represents the participants' own words that were written down by the researcher is presented and interpreted.

In section 7.4.2, the researcher's notes that represented the participants' feedback on specific sub-types of information behaviour that were identified in chapters 5 and 6 as areas for further exploration are presented. In this section, very few direct quotes from the participants are used because the discussions were so lively, prolonged and, on many occasions, confidential, that it was more pragmatic and ethical for the researcher's summary of the discussions to be presented as evidence.

In section 7.4.3, the words that the participants wrote on their Post-it® Notes were mostly single words or very short phrases. Although, they are presented as evidence, they were also combined with the researcher's notes taken both during and immediately after the

workshop to represent paraphrased statements written by the researcher but indicating the participants' views about the value of the model of information behaviour.

7.4.1 Overall impression of the findings

This section shows the groupings of the content of discussions relating to the participants' overall impression of the research findings. The general feedback about the research and the model are summarised as follows:

- The groups agreed with the concept of information added-value when data and and/or information flow through the organisation, acquiring added value for the customer as a result of all the different interventions by information workers. This value benefits the organisation by raising its profile and reputation, helps it strengthen relationships and makes it become well respected and influential. The following words were written on Post-it® Notes during this discussion: "high profile", "good reputation" "relationship building", "influence the government". These brief written statements also reinforced the study's findings related to the categories of perceived internal impact of information behaviour.

- There was acknowledgement of the fact that a model of information behaviour should be non-linear because of the different information work roles and tasks which require information workers to move back and forth between information behaviours. A workshop participant commented as follows: "Not everything is on a straight line. Things bounce back to the beginning…". This comment moved on to a long discussion of what the final model should look like which is explained further in section 7.4.

Other views of the participants in relation to specific research findings and, in some cases, their experiences of interacting with information were as follows:

- The categories of information behaviour and associated concepts were an accurate reflection of their experiences and the participants were impressed with the similarity between the findings of the interviews and the online survey. This was evident in statements such as "…remarkable similarities…" and "…you were right to hand-pick us for the interviews".

- The participants benefited from the interview experience because they had the opportunity to reflect on their practice and recall incidents that took place a long-time ago. Excerpts of comments were: "it was almost therapeutic" and "it was really good to reflect on my experience".

- There was acknowledgement of the fact that multitasking and collaboration take place across all the main strands of information behaviour and that collaborating partners sometimes include the customer who initiated the request for information. An excerpt from a comment was as follows: "…That's true – as we collect or analyse the data, we work closely with others and we are multitasking all the time anyway".

- There was acknowledgement that feelings of frustration are very common when things don't go according to plan and especially when the circumstances are beyond the control of the information worker. A participant stated: "Very frustrating. Nothing could be done about it…".

- The participants discussed their endless walking on the tight rope between providing information to satisfy the information needs of the customer while complying with freedom of information legislation on one hand and complying with data protection legislation on the other hand. A paraphrased statement from a participant provides evidence of such a discussion: "On one hand we want to be as helpful and open as possible. On the other hand we are duty bound to protect aspects of the data … everyday occurrence".

7.4.2 Categories of information behaviour

The following summarises the participants' comments during discussions relating to specific subtypes of behaviour that required further exploration as identified in chapters 5 and 6:

- *Neutral feeling as a subtype of feelings*: This subtype of feelings was added to the questionnaire prior to pretesting even though it was not captured during critical incident interviewing (see sections 4.6.1.2 and 6.3). The reason for doing so was to recognise the existence of neutral feelings as presented in Tenopir et al (2008) and Pucci (2010) in order to create a balance between the positive and negative feelings that were identified during interviewing. The participants agreed that it is possible for people to have indifferent feelings but it would be rare and that they would not have articulated their feelings as being neutral immediately following an information activity except if they were completing a questionnaire with neutral feelings as an option. The participants added that it is also possible that people may say their feelings are neutral because they do not quite understand how they are feeling and can't find the right words to label their feelings. One participant remarked: "C'mon. Everyone experiences feelings. Even if someone has neutral feelings, it would only last for a fraction of a second before it turns into something positive or negative". Another participant remarked: "…perhaps they experience a

mixture of feelings and so they say it is neutral feelings". Tenopir et al (2008), in coding transcripts of interviews for determining feelings during the information search process, categorised the three words "careless, indifference and ignore" (p. 110) as neutral feelings. Pucci (2010, p.3) argued that "the word calm best describes a neutral feeling". These words or their synonyms were not identified during the interviewing stage of the present study and the majority of respondents to the questionnaire survey did not identify with this type of feeling state. Therefore it provides opportunities for further exploration of neutral and mixed feelings states in future qualitative research.

- *Anxious and worried feelings*: These subtypes were added to the questionnaire as a result of the feedback from the pretesting of the questionnaire. It was therefore important to understand why they were not captured during interview. The participants explained that, during interviewing, they would not have revealed that they were experiencing anxious and worried feelings because they would have assumed that both anxious and worried feelings are part of the mechanism for feeling frustrated. They added that, on reflection, they understand and agree that anxious and worried feelings are part of the negative feelings that information workers could experience, and that "frustration, anxious and worried should be three subtypes of feelings". This shows that there may be a relationship between anxious, worried and frustrated feelings which indicate opportunities for further research. This example demonstrates the value of mixed methods research where certain words for identifying subtypes of feelings may not be captured during interview due to the vocabulary and/or sub-culture of the interviewees but may be captured by questionnaire survey because they exist as options in a scale.

- *Blame others when things go wrong as a perceived impact of information behaviour*: The workshop participants explained that, even if blame culture exists, it may be isolated to a "very small number of people" because the working environment is generally very supportive and understanding. This was reflected in the overwhelming majority of survey participants who disagreed or strongly disagreed with this phenomenon as shown in chapter 6.

- *Deskilling of staff not involved in information activities as a perceived impact of information behaviour*: The participants explained that it is inevitable that sometimes, when responding to deadlines for meeting the information requirements of a customer, only a small group of people may be involved in dealing with the customer and this is to the detriment of others because learning is not shared. They provided ideas about what they do to mitigate these problems in their own work areas which included "routine sharing of information with colleagues" and "reflection sessions during team meetings" to learn from experiences.

- *Figuring out as a subtype of information acquisition behaviour*: One participant explained that the description of figuring out should include using one's "personal knowledge and wisdom". By this the participant was referring to the enhanced effectiveness of the figuring out behaviour when the person engaging in the behaviour has a lot of knowledge and experience.

- *Sources of information and customers of information*: There was some discussion about the subtypes of sources of information and customers of information. All the participants agreed that the categories were appropriate. There was also agreement to include 'self' as a customer of information in the visual model of information behaviour to cover, as explained in the interpretive summary in section 5.3, instances when information workers do exploratory work to improve their skills or engage in proactive information behaviours that may add value to an information product or service.

7.4.3 Value of the model

Some of the relevant words to represent the value of the draft model written on Post-it® Notes by the participants include: "push-pull system", "complex behaviours", "model can improve processes", "lean and continuous improvement", "has list of work activities", "can improve ways of handling information", "gives us a good understanding of processes", and "awesome". At the end of the workshop, the researcher examined these short statements and matched them with the relevant sections of personal notes written during the workshop and thereby constructed statements that best captured the participants' discussions about the value of the model of information behaviour of the information provider:

- "Push-pull system": Many people, not involved in ISD's work, have misconceptions that the only way the information workers get information to customers is by emailing or publishing on ISD's website. The model details the range of information push-and-pull mechanisms for passing information on to the customers e.g. information workers pushing out information by means of emails and publishing on the website, and customers directly pulling prepared information from ISD's servers.

- "Has list of work activities": The categories of information acquisition behaviour are useful for the staff who work in the data management areas of ISD because they can have a better understanding of the range of information activities involved in acquiring information and so can develop technological solutions for improving the gathering and finding of information.

- "Can improve ways of handling information": The model will be useful to the interview participants and the organisation as a whole. This is because it could be used to manage an information service effectively with a better understanding of the contributions of the various information workers to the information and intelligence that are given to the customer.

- "Model can improve processes"; "awesome": Information production behaviours are a mystery to most people outside the organisation because they are completely unaware of what different people do with the information. This model pulls everything together and there are many opportunities for making things better by having the knowledge of how people use information and how they feel about it.

- "Complex behaviours": The information behaviours in ISD are very complex and it is extremely useful to see everything captured and written down in the way the researcher has done.

- "Lean and continuous improvement": The human aspects of information behaviour are captured very well and there is enough information about how the information workers feel and think to capture the attention of managers responsible for continuous improvement.

One notable observation about the comments on the value of the model is that there were no comments that suggested that the model would not be of value to information workers and the information provider as a whole. The participants were overwhelmingly positive about the model and they offered suggestions for the final model which are discussed in section 7.5.

7.5 Visualising the phenomenon of information behaviour

The respondent validation sessions provided the validation of the findings necessary to develop a visual representation, or model, of the phenomenon of information behaviour of an information provider in order to meet the aim of the present study. To recapitulate, as explained in section 1.4, the aim of the research is to describe, categorise and devise a representation of the experiences of information behaviour of an information provider.

The interview participants recommended that the final model of information behaviour should not involve line diagrams because they believed such diagrams represented linearity. They were therefore satisfied with the fact that the draft model was not a line diagram. However, they observed that the draft model, while non-linear, looks linear and requires supplementary information to explain that it is non-linear. They therefore suggested that the visual representation should be altered so that the model would

present as non-linear at first glance without additional explanation. They also suggested that the model should be self-explanatory and therefore should include as much of the findings as possible within it so that any reader can quickly identify the meaning of the model. This was evidenced by the following words used by the participants: "although no lines but everything is too straight in one direction" and "the model should tell you the full story".

With this in mind, a model was developed that comprises 3 diagrams as shown in figures 7.2, 7.3 and 7.4 which are different cross-sectional views of a three dimensional model. They represent different slices obtained at different time intervals. They portray 5 themes – "complexity", "hierarchical", "non-linear", "interlocking", and "multifaceted" which were words that were suggested by the workshop participants. There was agreement at the workshop that the final model should contain all the elements of the draft model presented in section 7.2 but the participants were clear that the final model should go further and embrace the 5 themes and should contain as much of the findings as possible within it.

To meet the requirements of visual non-linearity, Wilson's (1999a) nested model of information behaviour, shown in figure 2.12, influenced the design of the final model. The final model depicts a series of horizontal and vertical prolate spheroids with the most external prolate spheroid representing the internal environment of the provider organisation. The spheroids are constantly moving and have permeable surfaces that allow information interactions with the surrounding environment.

The idea of movement and permeability was chosen because it represents complexity, multifaceted and interlocking. It is also a product of the researcher's interpretation of the work of the information workers determined from the critical incident interviews and the respondent validation workshops. For example, without being too specific in order to preserve anonymity, a typical information worker would be engaged in an information acquisition activity such as 'figuring out' in response to an information request from an external customer. The information worker then concludes that she requires additional information from the external customer and a colleague in order to help her make sense of the information problem. Having received additional information, she realises that the information request may have implications for another colleague who is involved in a different project and about to formally present his outputs to a group of external customers. She discusses this potential issue with this male colleague, who then realises that more analysis needs to be done with a statistical software application before presenting information to the group of customers. This causes a lot of frustration in the male colleague who was looking forward to the end of his 6-month old information project; whereas it causes feelings of satisfaction in the original information worker who feels she

has mitigated a potential risk and made sense of her information problem. What is happening here is that information workers constantly interact with information, people and systems across the self, the internal organisational information environment and the external information environment as they engage in added-value information behaviours. They therefore do not work in silos and there is constant interaction with another environment. This is why their information activities, sources of information, customers, feeling states and perceptions are all indicated as having permeable surfaces in the final model of information behaviour.

The constituents of the spheroids are the information behaviours, the feelings, the perceptions of the impact of the information behaviours on the internal environment of the organisation, the sources of information that the information workers interact with, and the triggers of information as identified as the key findings described in chapter 5. Together they form the information inputs, information activities, outcomes (feelings) and perceived impact that result in value being added to information so that the customers' information needs are met. Some of the sources of information and triggers of information originate from outside the sphere (e.g. from other organisations as shown in figures 5.4 and 5.5) and so interact with the external environment. Figure 7.2 below shows the first view of the spheroid.
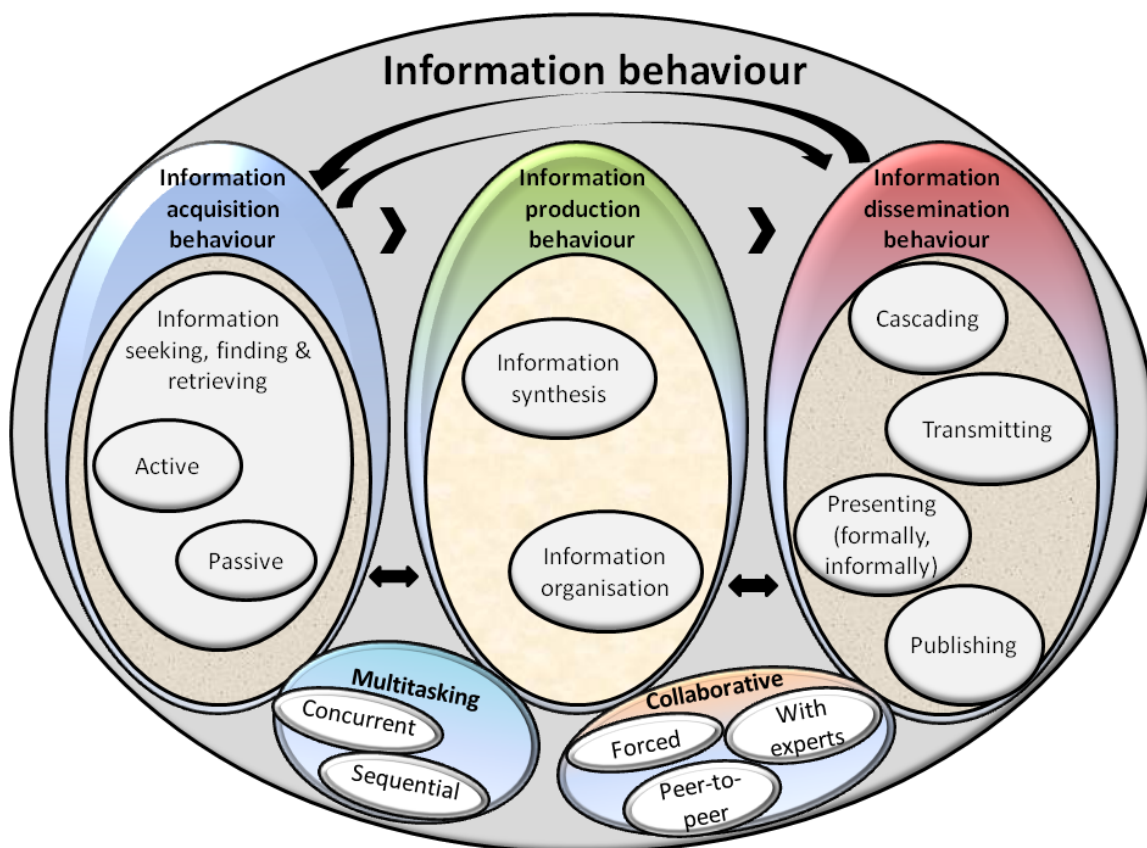
Figure 7.2 Model of information behaviour – core and associated behaviours

In figure 7.2 above, the view is of a vertical slice of the prolate spheroid from one direction at a point in time. It shows that the core information behaviours are information acquisition, information production and information dissemination. Straddled across them are the associated information behaviours of multitasking and collaborative. The model illustrates a non-linear interaction between the core and associated information behaviours. There are mini prolate spheroids nestled within each of the core and associated information behaviours and these illustrate the hierarchical level of the categories of each of these information behaviour types. The information behaviour types and subtypes have been described and defined, where necessary, in chapters 5 and 6.

In figure 7.2, the arrows depict movement sometimes back and forth and sometimes in one direction. The slice of the model that is represented in figure 7.2 is taken at a point in time as the spheroids are moving. Therefore, for example, the position of the multitasking spheroid nestled between the information acquisition behaviour and information production behaviour spheroids is not static because of the constant movement of all of the spheroids.

Figure 7.3 below shows the result of another vertical slice of the prolate spheroid from another direction.
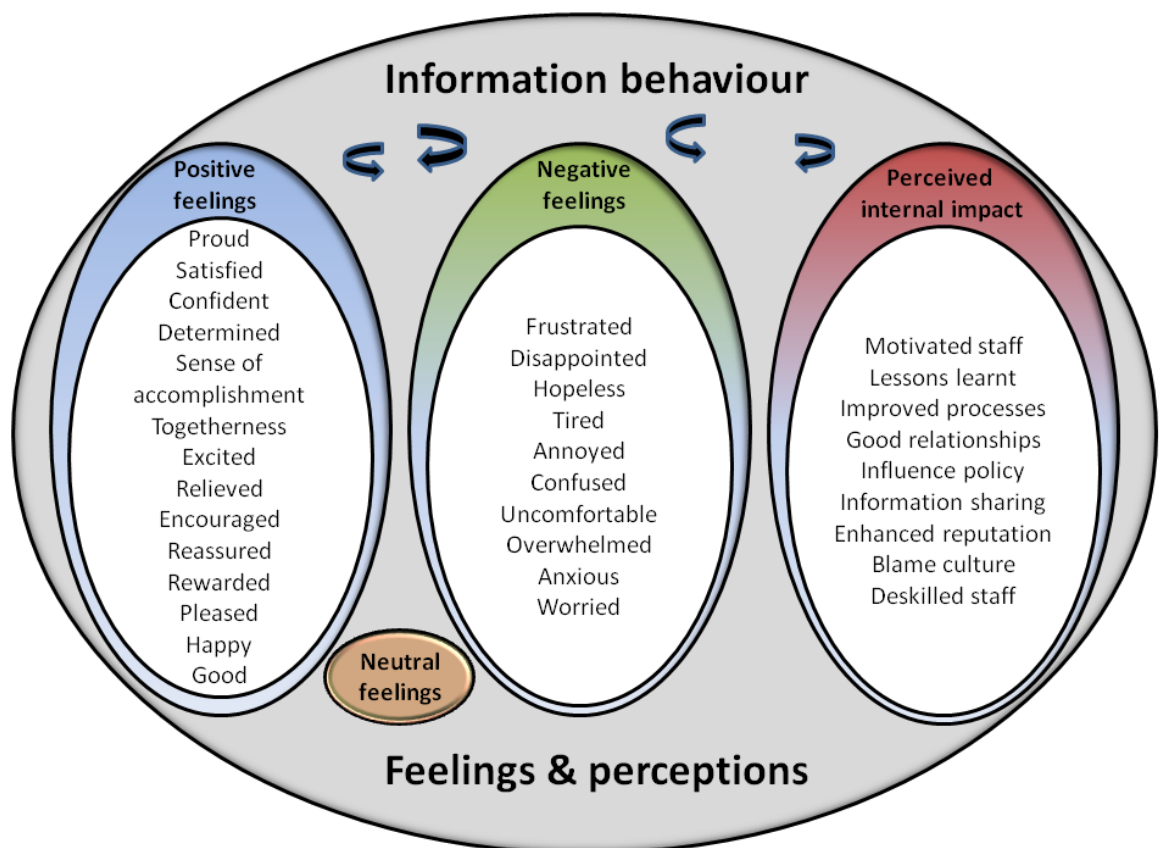
Figure 7.3 Model of information behaviour – feelings and perceptions

In figure 7.3 above, feelings as outcomes of information behaviour as well as information workers' perceptions of the impact of their information behaviours on the internal environment of their organisation are shown. The other elements of the model are not shown because the slice of the model shown in figure 7.3 is different from that shown in figure 7.2 in terms of deepness of slice and point in time. The feelings are positive or negative and a small number of people do express neutral feelings which are neither positive nor negative. The positive, negative and neutral feelings as well as the perceived internal impact of information behaviour are shown in sections 5.10, 5.11 and 6.3 where their subtypes are also presented and are similar to those shown in figure 7.3.

Yet another slice of the prolate spheroid from another direction and at a different point in time shows, in figure 7.4 below, how the information behaviour subtypes are interacting with one another and also interacting with the sources of information and customer types.
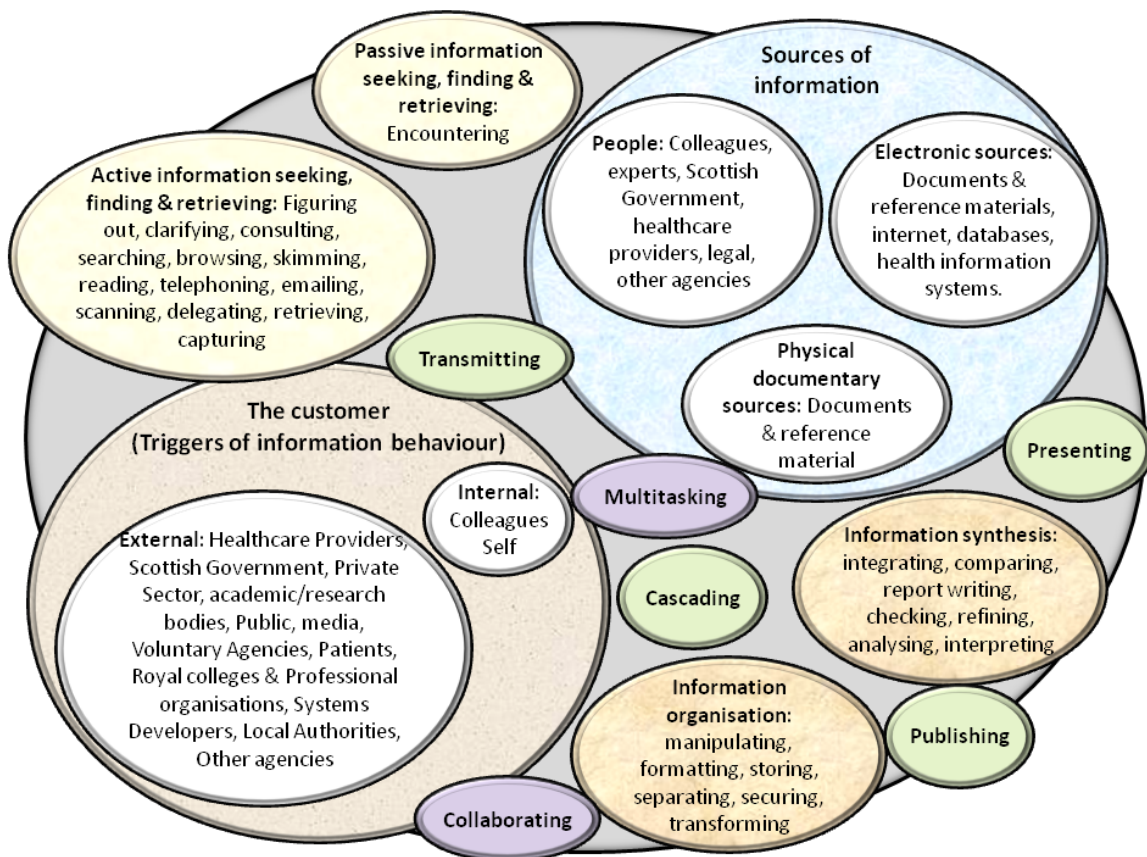
Figure 7.4 Model of information behaviour – information interactions

Figure 7.4 represents the key findings presented in chapters 5 and 6. The 2 types of customers are shown as internal and external. Likewise, the 3 types of sources of

information are shown together with their subtypes. Straddled across them are the various types and subtypes of information acquisition, production and dissemination behaviours together with the multitasking and collaborative information behaviours. As these information interactions are taking place, outcomes such as feelings manifest themselves in the information workers, the information workers develop opinions about the impact of their information interactions, and value is being added to the information as it flows throughout the spheroid by the information activity contributions by each of the information workers which include multitasking and collaborative information behaviours. At the same time, the customers who triggered most of the information behaviours of the information workers are having their information needs met.

Some of the spheroids are attempting to push through the outer spheroid's permeable surface and other spheroids are pushing into one another's permeable surface. These states are representative of movement and permeability which have been described earlier in this section.

7.6 Summary

This chapter has presented the findings of the respondent validation exercise which allowed the researcher to hear the views of the interview participants about the researcher's interpretations of the findings of the mixed methods study. The workshop participants validated the findings and agreed with the elements of the draft model presented to them although they recommended that the final model incorporate more of the findings in chapters 5 and 6 and better portray the concept of non-linearity.

The workshop participants indicated that they had found the research experience very useful as they were able to reflect on their practice. They believed that the model of information behaviour would be of value to their organisation and there was much learning from the research findings that could be put to good use. There were no significant changes to the findings but valuable contributions were made to the explanations of some of the findings that emerged from the empirical work and also contributions to the content of the visual model of information behaviour.

The discussions during respondent validation sessions, as well as the findings of the critical incident interviews in chapter 5, inspired the thinking behind the concept of a permeable prolate spheroid to present the model of information behaviour of an information provider. The diagrams presented in this chapter illustrate vividly the findings of the present study and use metaphor to facilitate an appreciation of the various information interactions within such a complex information environment.

CHAPTER 8: Discussion

8.1 Introduction

This chapter presents a discussion of the final model of information behaviour of an information provider, which was described in chapter 7, while placing it in the context of other relevant theories and models. There is a reflection of the overall quality of the research, together with a critical reflection of the entire research process.

8.2 Overall quality of the study

In chapters 5 and 6, the robustness of the qualitative and quantitative phases was justified within a framework of research quality and rigour developed in chapter 4, using quality indicators adapted from Lincoln and Guba (1985), Trochim and Donnelly (2006), Smyth (2006), and Teddlie and Tashakkori (2009) as shown in table 4.4. In addition, the overall quality of the study has been enhanced as a result of the ethical considerations that included going through a gatekeeper, seeking informed consent from study participants throughout the data collection phases, avoiding deception, protecting the privacy of the study participants, and keeping participants updated with progress of the analyses and emerging findings.

Quality was also evidenced by the Heideggerian phenomenological approach informed by Colaizzi (1978) whose last stage, as discussed in chapter 4, consisted of returning to the interview participants to seek validation of the overall findings and agree the contents of a final model of information behaviour of an information provider that was acceptable to both the researcher and interview participants, thereby resulting in an experience of co-creation. This co-creative experience is a component of the philosophy of pragmatism that Teddlie and Tashakkori (2009, p. 90) describes as an "interactive relationship" between the participants and the researcher that also accommodates the distance and impartiality required by the researcher in handling and analysing other parts of the study's data.

With the overall research findings having been endorsed by the research participants during the respondent validation workshops, there was no conflict with the quantitative survey findings and this contributed to the overall quality of the research.

8.3 The value of the model of information behaviour

Underpinning the model of information behaviour of an information provider, presented in chapter 7, are the concepts of information and information value. Narula (2006) argues that it must be assumed that "any action has a message value" (p. 7). In chapter 5, it was evidenced that some information workers in ISD acquired data which was then transformed into information using processes that are standard within ISD, with information referring to data with meaning and structure. Others acquired information and their knowledge and experience of the wider information landscape helped them transform it into intelligence. As these activities were taking place, the product or service for the internal or external customer was gaining added value and meeting their needs. As argued by Taylor (1982, p. 343), "a message is given value by a "user" who sees its "usefulness" because he [or she] sits in a particular environment and can relate the message to the problems and tasks of that environment". The interpretation of the findings in chapter 5 are helped by Taylor's (1982) argument in that the information workers engage in information activities that they believe add value because they are users of information themselves and they interact with external users by working collaboratively and receiving feedback.

As described in chapter 7, it would not have been appropriate to draw lines within the final model to connect the representations of the flow of data/information and the information behaviours present within the provider's environment because the processes are complex, interact with each other in several ways and are therefore non-linear; hence the depiction of the model using prolate spheroids to denote flow within a 3-dimensional space and porous surfaces to denote complex interactions from various directions.

The categorisation of information behaviour of the information provider and representation of experiences of information behaviour of information workers as shown in the findings in chapters 5, 6 and 7 bring together, in a new meaningful way, the relationships between many concepts. Some of these concepts are already known, but disparate, in LIS and other disciplines such as economics, management, communication studies, organisational studies and psychology. The definitions of the concepts and their relationships have been presented in chapter 5. The relationships between the concepts create a novel picture, in the form of a model in figures 7.2, 7.3 and 7.4, of what goes on in an information provider organisation in the specific context of the present study's research location. It must be emphasised that the model cannot stand alone because there is considerable interaction between the external user and the information provider as evidenced by the collaborative information behaviours, as well as the other information behaviours, described in chapter 5. The model presented in chapter 7 focuses primarily

on that part of the information journey that exists within the internal environment of the information provider in order to narrow the LIS knowledge gap of the information activities that take place in an information provider organisation. As explained in chapter 1, it is important to understand information interactions within an information provider organisation such as ISD so as to equip information service managers as well as the information workers with enough evidence to aid decision making.

What happens between information providers and information recipients has been addressed in other disciplines such as communication studies, where much is known about the messages that flow between a sender/communicator and the receiver. Narula (2006), for example, presented numerous models of communication and explained that, by communicating through channels and through direct means, feedback loops and communication networks exist between the sender and the receiver which involves exchanging, rejecting or accepting, problem-solving, and valuing communicated messages. The present study, however, extends these communication models by revealing the human dimensions of feelings and perceptions of the information provider while evidencing feedback loops during information activities, such as emailing, telephoning, consulting, integrating, separating, and working collaboratively with the end users.

The model of information behaviour of an information provider presented in chapter 7 is a refinement and validation of some existing models of information behaviour discussed in chapter 2. For example, the final model of information behaviour presented in chapter 7 has the following merits:

- It contrasts with the CIA (2011) intelligence cycle by showing that the CIA (2011) model is too linear, rigid, omits the complexity of the multi-directional information interactions and does not incorporate the outcomes (feelings) of information behaviour and the perceptions of impact by the internal actors which are important psychological and value-and-impact components of information behaviour
- While agreeing with the conceptualisation of the hierarchical nature of the levels of seeking information behaviour in Wilson's (1999a) nested model, it extends Wilson's (1999a) model by showing the hierarchical nature of the levels of all types of information behaviour in ISD
- It addresses the questions about what happens beyond the information seeking stage, posed by Godbold (2006), by revealing relationships between information activities for all types of information behaviour identified in ISD

- It presents a wider range of emotional responses when compared with Kuhlthau's (1993, 2004) model of information search process and Yeh's (2008) model of information behaviour
- It supports the findings of Tenopir et al's (2008) classification of positive, negative and neutral feelings

Through a mixed methods study incorporating qualitative analysis of experiences of a sample of information workers, complemented and corroborated by a census survey of occurrences of information behaviours, valuable insights into information interactions and relationships between information activities within the information provider have been obtained. The information workers endeavour to produce a service and/or an information product which they would expect the end user to find useful. They work collaboratively at various stages of the value-adding processes with the end user in order to create a degree of certainty within themselves that the end user will find the product or service useful. In addition, the value-adding processes do generate a range of feelings in the information workers. Tenopir et al (2008) refer to these feelings as affective behaviours. Tenopir et al (2008) also argue that, as people experience information behaviours and affective behaviours, they develop thoughts which are referred to as cognitive behaviours. The present study goes further to explore the information workers' perceptions of how their behaviours impact the internal environment of the information provider. It can be argued that the cognitive behaviours of the information workers are what help them form opinions and therefore develop perceptions of impact. Bringing all of these concepts together and gathering empirical evidence via mixed methods research, a model is presented in chapter 7 that contributes to our understanding of the information interactions in a health information provider organisation.

The model of information behaviour of the information provider has implications for other models and theories of information behaviour. It challenges the concept of information use which is used loosely in LIS literature without detailing exactly what it involves for those who provide as well as those who receive information. It presents information providers as users of information and also providers of information.   The model challenges those who develop theories which are derived from the lens of seekers of information, to consider deriving additional theories through the lens of providers of information in order to capture the full picture of the provider-receiver interactions.

The concept of information seeking behaviour is presented in the present study's model as being a subset of information acquisition behaviour. While a few studies do exist that focus on information acquisition (e.g. Miettinen 2012; Schulte-Mecklenbeck, Murphy and Hutzler 2011), even more studies focus on information seeking behaviour as reviewed in

chapter 2. The model proposes the inextricable link between information seeking, information finding and information retrieving behaviours which is present when the concept is viewed through the lens of an information provider.

The model uses the term information production behaviour, adapted from the discipline of economics, which comprises information synthesis and information organisation and is used to refer to those transformation activities that occur when once information is acquired. Although synthesis and organisation in relation to information are terms which are used in LIS literature, they have not been conceptualised as subtypes of information production as shown in the present study's model of information behaviour of the information provider.

The information dissemination behaviour sub-types in the model are transmitting, cascading, presenting (formally and informally), and publishing with the aim of sharing, providing a quality service, seeking feedback and responding to the needs of customers. Information dissemination behaviour in LIS comprises added value activities as argued by Taylor (1986) and Roosendaal et al (2003) and is identified as an information behaviour in only a small number of studies; for example, Baldwin and Rice (1997), Musoke (2007), Mchombu (2003) and Mutshewa (2007b). However, in communication studies, much is known about the channels/medium, recipients and effects of communication as identified by Narula (2006), Steinberg (2007), Windahl, Signitzer and Olson (2009) and McQuail (2010) with reasons for disseminating information such as to educate, inform, influence, manipulate and seek feedback. The model of information behaviour of the information provider therefore provides scope for LIS researchers to further investigate information dissemination behaviours of other information providers with a view to fully understanding information dissemination and extending the model presented in chapter 7.

The model of information behaviour of an information provider highlights the lack of consideration of emotions and feelings in most models of information behaviour. It points to the value of applying the work done by Nahl (2001), Kuhlthau (2004) and Albright (2011), among others, in recognising the psychological perspectives of information behaviour. Organisations should take the emotions of their staff seriously. Baumeister, Dewall and Zhang (2007b) argue that "human decision making that makes use of lessons learned from emotional experiences and consideration of anticipated emotional states may be a beneficial and successful decision making strategy" (p. 29). Fredrickson and Cohn (2010) argue that, while it is a natural response for people to experience both positive and negative emotions, positive emotions result in good health, better mindset, better relationships and personal resilience and fulfilment. Borrowing an argument from the discipline of communication studies, Peters et al (2006) assert that emotions play a

motivating role in information processing and behaviour. There is therefore evidence in the literature that feelings and emotions are important considerations when making decisions and the findings of the present study have demonstrated the importance of feelings as information workers engage in information behaviours.

8.4 Achieving the aim and meeting the objectives

As explained in section 1.4, the study aimed to describe, categorise and devise a representation of the experiences of information behaviour of an information provider. After gaining permission and seeking informed consent, 10 purposively selected interview participants engaged in critical incident interviewing in order for their experiences of information behaviour, within a methodological framework of Heideggerian phenomenology, to be understood. The participants provided considerable insights into their respective realities which were interpreted by the researcher and used as a basis of developing an instrument. Being faithful to the philosophy of pragmatism and hence a qualitatively-driven mixed methods research, the instrument was deployed, via census survey, against the entire population of 81 information workers in order to supplement the qualitative findings.

With a survey response rate of 86.4%, there was congruence between the findings of the survey and those of the interview participants which enabled, not only experiences of 10 individuals to be described and interpreted, but also inferences about 'the provider' to be made; that is, ISD as an information provider organisation.

To meet the entire aim of the study, the 3 research questions were mapped to 5 objectives which were in turn mapped to the key planned research outputs as summarised in table 3.1 in chapter 3. The key planned research outputs indicate whether or not the aim and objectives were met. Table 8.1 below describes and signposts the evidence for each of the 8 planned research outputs.

Table 8.1 Evidence for the planned research outputs

Key planned research outputs	Evidence
1 Extracts of experiences of information workers.	Extracts of the interview transcripts that depict the experiences of the information workers are presented throughout chapter 5, together with the researcher's interpretations and links to existing literature.
2 Categories and hierarchies of information behaviour.	The information behaviours (acquisition, production, dissemination, multitasking and collaborative) and their subtypes of are illustrated and described in chapter 5. Then, following the questionnaire survey, they are shown in figures 7.2, 7.3 and 7.4 in chapter 7.
3 Categories of feeling states.	The categories of feeling states are illustrated in figure 5.17 (chapter 5) and figure 7.3 (chapter 7). The illustrations are followed by descriptions and interpretations within the respective chapters.
4 Categories of perceived impact of information behaviour.	The categories of perceived impact of information behaviour are illustrated in figure 5.17 (chapter 5) and figure 7.3 (chapter 7). The illustrations are followed by descriptions and interpretations within the respective chapters.
5 Item response frequencies.	The item response frequencies are presented and interpreted in sections 6.2 and 6.3 (chapter 6).
6 Associations between specific demographic and information behaviour variables.	Chi square and, where necessary, Fisher's Exact tests were done on the survey data to determine whether there were any demographic influences on any of the subtypes of each of the core and associated information behaviours. The findings are presented in detail in section 6.4 (chapter 6).
7 Visual representation of model of provider information behaviour.	Following the return to the interview participants to seek validation of the combined qualitative and quantitative findings, a model of information behaviour was designed and presented in figures 7.2, 7.3 and 7.4 (chapter 7).
8 Description of a model of provider information behaviour.	The description of the model is in section 7.4 (chapter 7) and is accompanied by the definitions of the terms used to categorise the various types and subtypes of information behaviour which are presented in chapter 5.

In table 8.1, there is evidence of the presence of each of the 8 planned research outputs within chapters 5, 6 and 7. This provides the information necessary to conclude that the aims and objectives of the research were met.

8.5 Critical reflection

There were personal experiences during the design, execution, analysis and presentation of the research which played critical roles in some of the decision-making processes in the present study. In describing these experiences in this section, there is an opportunity to reflect on what could have been done differently if other conditions existed.

8.5.1 Searching for relevant literature

The literature on information behaviour within LIS has both significant breadth and depth. To complicate matters, there are theories, models and studies by well-established and accomplished authors that were necessary to examine as part of the literature review process. This was so that the decisions pertaining to the choice of research questions were grounded on literature that is the product of authors who were experts in their field, thereby adding credibility to the study. However, the fast pace at which new material was emerging on various areas related to information behaviour was high and made it necessary to keep a balance between attempting to include newly published material and ensuring adherence to the scope of the study which is presented in section 1.5. The right balance was achieved because the criteria for literature selection described in the literature review methodology in section 2.2 ensured that the most appropriate literature was used in the research.

Information behaviour in the literature extends well beyond the LIS discipline into psychology (Nahl 2001, Albright 2011), human resource management (Zoogah 2011), business/strategic management (Porter 1985, Porter and Millar 1985), communication studies (Narula 2006, Windahl, Signitzer and Olson 2009), information technology (Twidale and Nichols 1998), military command and control (Sonnenwald and Peirce 2000, Prekop 2002, U.S. Marine Corps 2005), anthropology (Spink 2010), tourism and hospitality (Gursoy and Umbreit 2004, Jogaratnam and Law 2006), and many more. This strategy helped make the final model more relevant especially as information providers exist across disciplines. However, while accessing literature from other disciplines, it was necessary to maintain a balance such that the study remained embedded within LIS while accommodating other disciplines. This was achieved through constant self-reminder of staying predominantly within LIS.

As explained in chapter 2, information behaviour has been used synonymously with information seeking behaviour and other subtypes in many studies and, in particular within abstracts of published articles. For most of those articles, it is only by reading them in depth that it becomes clear what subtype of information behaviour is being researched. This complicated matters when using key words in searching for literature, among the plethora of studies that addressed the concept of information behaviour in its broadest sense. However, although the literature search process took place during the entire research process, only a small number of studies was of core significance and complied with the literature selection criteria as explained in section 2.2.3.

8.5.2 The philosophical approach

It was stated in chapter 1 that the research is guided by the philosophical stance of pragmatism which is flexible enough to accommodate both subjective and objective viewpoints. While this approach may not be satisfactory to paradigm purists, the widely quoted phrase by Miles and Huberman (1984) sums up all the arguments in chapter 4 of the present study for adopting pragmatism: "Epistemological purity doesn't get research done" (Miles and Huberman 1984, p. 21). In addition, there are compelling arguments conceived by Johnson and Onwuegbuzie (2004) for supporting the use of pragmatism as a "third research paradigm" (p.14) in mixed methods research in order to arrive at the best approach for understanding phenomena in the real world.

In the present study, while one of the methodological phases is labelled as the qualitative phase and the other referred to as the quantitative phase, both phases contained elements of qualitative and quantitative approaches. For example, in providing excerpts of interview transcripts as evidence for various information behaviour subtypes in chapter 5, histograms were used to illustrate the frequencies of information behaviour experiences. Likewise, in chapter 6, there were subjective influences when describing and interpreting the quantitative survey response frequencies. In addition, within the qualitative phase, the interviews were based on critical incident style of interviews but they were analysed using the Heideggerian phenomenological approach which was informed by Colaizzi (1978). This was evidence of the flexibility within mixed methods research which the classical pragmatist, Peirce (1878b), attempted to convey in his writings on truth and reality where he also argues for a kind of qualified reality which may involve consensus building and consideration of others' opinions and versions of their truth. In the present study, the respondent validation exercise provided an opportunity to gain consensus and arrive at a both a single reality and a collection of multiple realities of the phenomenon of information behaviour. One example of this was the consensual development of a model of information behaviour of the information provider that comprised elements of the subjective experiences of several individuals.

8.5.3 Recruitment of research subjects

The recruitment of research subjects for the qualitative phase was ethically bound to take into consideration the permissions and advice from the gatekeeper at the research location. Having been advised that there was to be only minimal intrusion of research subjects, the right decision was taken to recruit team leads for the interviews on the basis that they had sufficient knowledge and experience of their work area and so could be revelatory with their critical incidents and would have a grasp of the information activities within their work area without the need to interview others. This approach worked well

because, even though all interview participants were given the opportunity, only 1 team leader suggested that another team member participate in the interview in order to bring a different perspective within their area of work. Also, the 10 interview participants were within the sample size limits in many peer-review studies that employ phenomenology as explained in chapter 4.

It was evident that the information workers endeavoured to add as much value to the information for the benefit of their customers and their organisation's reputation. In a similar way, they were very willing to participate in the piloting phases and the main interviews and survey and provide as much insight as possible into their experiences. They were motivated because they saw the research as useful in practice. Recruitment of subjects was therefore straightforward but the process was regularly being checked against any potential ethical issues related to coercion, power relations and level of informed consent.

8.5.4 Methodological challenges

Having reviewed the merits and demerits of all the various methodological options, given the aim of the research and the research questions, phenomenology was the choice of methodology in the qualitative phase and survey was the choice in the quantitative phase. Within phenomenology, there are various approaches and methods and, even though it was shown in chapter 4 that the merits of Heideggerian phenomenology outweighed those of Husserlian phenomenology for the present study, many approaches including those of Merleau-Ponty (1962), Gadamer (1975), Smith (1996) and Smith, Flowers and Larkin (2009) which are compared in table 4.3 had to be considered. In the end, although Heidegger (1927/1962) was selected, it was challenging to choose between the various methods aligned to the Heideggerian approach. At this stage it was necessary to review extant studies that had employed the various methods aligned to the Heideggerian approach to understand how they were applied. Van Manen (1997) and Colaizzi (1978) were found to be the most appropriate methods but there were considerable similarities between the two methods which made either of them a suitable choice. In the end it was the fact that Colaizzi (1978) recommended returning to the participants to validate the findings whereas van Manen (1997) preferred seeking feedback from research peers that resulted in Colaizzi's (1978) recommended steps being employed within the Heideggerian framework. It was necessary to involve the interview participants as co-creators of the model of information behaviour so that it would incorporate experiences of their validated realities. However, many elements of van Manen's (1997) steps were present in the method employed and there were many challenging decision-making processes throughout.

The phenomenological methodology facilitated the construction of meanings and interpretations from the experiences of the information workers and the researcher's forestructure of understanding. Constructing meanings and interpretations were not straightforward process because they had to be repeated within and between interview transcripts until the researcher was satisfied that the interpretations were a true reflection of the data.

The strength of using phenomenological methodology within a mixed methods approach was that it was compatible with the decision to develop an instrument with the findings of the interviews, develop a draft model of provider information behaviour, and then return to the interview participants to co-create a final model of provider information behaviour. The feedback from the participants with regard to the benefits of their participation in the research and the relevance of the model to their practice areas was an indicator of how robust the methodological decisions were.

The methodological decision-making processes involved being mindful of alternative methodologies. For example, a case study comprising a variety of data sources for improving data credibility (Yin 2009) such as direct/participant observations, diaries, interviews and quantitative surveys would have been an alternative choice of research design if the research participants were permitted by the gatekeepers to engage with the research for longer periods of time. Baxter and Jack (2008) argue that the contribution of each data source strengthens the understanding and interpretation of the phenomenon under study.

The study in its entirety has adopted a unique blend of mixed methods research (MMR) which adds to the growing number of LIS studies using MMR approach. This is particularly significant as Fidel (2008) argues that, even where LIS studies use mixed methods, MMR as a concept and label has not been established in LIS which "is behind several fields in the social sciences – such as sociology, social policy, and management – in recognising this approach" (Fidel 2008, p. 271).

8.5.5 The interview experience

One observation about the interview process was that participants were very willing to tell their stories and, when reflecting on the process at the end of each interview, it was evident that there was a therapeutic benefit for the participant. Not just merely listening to their experiences but asking the interview participants to elaborate and explain while validating what they were revealing by making connections with what had already been revealed is a strategy recommended by Kvale and Brinkmann (2009) which may have contributed to the therapeutic benefits. The participants expressed feelings of satisfaction

and surprise at the breadth and depth of their experiences which, were it not for the interview, they would not have had the time to reflect upon. Kvale and Brinkmann (2009, p. 15) add that "the unfolding stories and new insights can be rewarding for both parties in the interview interaction".

During the interview process, as the participants recounted their stories in response to critical incident interviewing, they were entering a zone where they could visualise experiences that were real to them and findings ways to articulate their experiences, feelings and perceptions. There were many non-verbal communications such as gesticulating and becoming vivacious when describing their positive feelings and, whenever they would describe experiences that resulted in less-than satisfactory outcomes such as feelings of frustration, their facial expressions, or emotion-expressive behaviours (Butler, Lee and Gross 2009) validated their experiences. These observations during interview were similar to those identified by Taylor (2001) who observed thus: "The participants' non-verbal body language and expression confirmed not only what they were saying, but the deepness and realness of the data for them" (Taylor 2001, p. 654).

The interviews were the key component of the qualitatively-driven sequential mixed methods approach for the present study and, without the interviews, the overall findings would not have been as rich and representative as they were.

8.5.6 The survey experience

The piloting and re-drafting of the survey instrument were crucial processes that determined the final structure and content of the questionnaire. Time efficiency, research participant anonymity, high rate of return and use of standardised questions were advantages of using a questionnaire (Munn and Drever 2004) but it was also evident that it was necessary to administer a questionnaire survey in order to fully answer the research questions. The small population of 81 determined the need to do a survey of the entire population rather than a sample of the population.

With the high rate of response, the survey was a success and the challenging part was making sense of the large amount of data. The analysis showed a high degree of congruency with the findings of the interview data which further strengthened the credibility of the research. The survey was therefore important in understanding what was going on within the organisation and supplementing the findings of the interviews.

8.6 Summary

This chapter has highlighted the value of the respondent validation workshops where, involving the interview participants as co-creators of the model of information behaviour

has resulted in the quality of the study and its findings being enhanced. The model of information behaviour of an information provider challenges developers of LIS theories and models of information behaviour to pay more attention to the information behaviour of information providers so as to develop a better understanding of the activities of information workers for supporting decision making.

The emergent model of information behaviour of an information provider is illustrated using prolate spheroids instead of line diagrams in order to account for the complex information interactions from various directions. Value of information is an important concept in the model in that, although the information workers engage in value-adding information activities to enhance the value of information, the recipients of the information also offer opinions about the value of the information they receive and provide feedback to the information workers.

The components of the model of information behaviour are a fusion of concepts from various disciplines such as economics, management, communication studies and psychology that must be considered alongside the information behaviours of the consumers of the information provided because of the continuous interactions between the information provider and the information recipient. The model extends other models of information behaviour and incorporates the feelings and perceptual (opinions of impact) dimensions of information behaviour, factors which should be taken into account when making decisions that affect information workers.

It is also argued that the findings of the tests of associations between demographic variables and information behaviour activities raise a number of questions and opportunities for exploring more complex associations in larger populations.

The aim and objectives of the study were met and the evidence presented. The critical reflection of the research stages and decision-making processes of the researcher demonstrate the robustness of the research. Searching for literature strayed into other disciplines to strengthen the relevancy of the final model but remained grounded within library and information science. It is argued that the philosophical stance of pragmatism created enough methodological flexibility and freedom to ensure that the right methods were employed for answering the research questions without being constrained by purity of epistemological and ontological positions. The study adds to the number of LIS studies that label their approaches as mixed methods research.

It is explained that the decision-making process for choosing the most appropriate method was complex and fit well into the constraints of research subject access. Were it not for

the small population and adherence to the boundaries of subject intrusion, a case study may have provided alternative opportunities to mix methods not only across the qualitative-quantitative phases but within each phase. The interview and the survey experiences are discussed in depth and they show that the research participants add value to the information they provide for their information recipients in the course of their work and often go out of their way to enhance the value. This, together with the high participation rates for the questionnaire survey and the willingness of information workers to tell their stories, provided insights which helped the researcher to understand what goes on within the information provider organisation.

CHAPTER 9: Conclusion

9.1 Introduction

This study has shown that its aim of describing, categorising and devising a representation of information behaviour of an information provider has been met. However, the significance of the study goes well beyond the research location and narrows the gap in LIS knowledge of the information interactions and experiences of an information provider.

A model of information behaviour of an information provider has been developed in this study that brings together concepts from LIS and other disciplines and emphasises the value of information on its journey into the provider organisation that commences with information in its raw form being acquired, produced and then disseminated both within and outside the organisation, but not necessarily in a linear order. There is recognition of the finding that, pre- and post-dissemination, there are feedback loops from the information end-user which contribute to improving the value of the information product and service. Categories of information behaviours that are relevant to information providers, insights into feelings as outcomes of provider information behaviour, and perceptions of impact of information behaviours have been presented in chapters 5 to 7 and discussed in chapter 8.

The paradigmatic orientation of the study to pragmatism has highlighted the potential for qualitative and quantitative approaches "for gaining understandings to a problem that exclusive use of either approach cannot achieve" (Kuhlthau 1999, p. 411).

This concluding chapter brings together the significance of the research and its main output – the model of information behaviour of an information provider. It also provides messages which should enable the reader to not only understand the value of the study within its limitations and boundaries, but recognise the opportunities the study provides in its practical applications to LIS research, its contribution to specific practitioners and its original contribution to knowledge.

9.2 Limitations of the research

The research location comprised a population of 81 information workers of whom 10 participated in interviews and 70 responded to the online survey. With such a small population, it was decided not to use volunteers from the research location to pilot the interview schedule and pretest the questionnaire because such an approach would have reduced the number of remaining information workers available for participating in the

main survey and interviews and the integrity of the findings may have been compromised. Therefore, information workers with previous experience of working in the research location, and who were working elsewhere in the wider parent organisation, were invited to pretest the questionnaire. This approach worked well, given the limited number individuals available for piloting, because the volunteers were familiar with the information activities in the research location and provided valuable feedback from the pilots which were incorporated in the final instrument.

Although the main drivers of the choice of methodology were the research aim and the research questions, the phenomenological and survey approach within the mixed methods framework was appropriate for the size of population and produced robust findings which were validated by the workshop participants. However, if the population of information workers were greater than 81, more statistical analyses could have been carried out, for example loglinear analysis (Field 2009), to explore associations between 3 or more variables.

There were limits placed on the duration that each research participant could engage with the research. This was to ensure that there was no disruption to their day-to-day work which was mandated by the gatekeepers. Given these restrictions, the Heideggerian phenomenological methodology for the qualitative phase was the most appropriate choice of methodology and the research findings were robust and validated by the interview participants. The critical incident interviewing technique which was employed in the research ensured that the interviews were focused and the information workers' experiences during each stage of the information flow were captured during the single interviews. However, if there were no access restrictions, then the choice of qualitative methodology would have been greater and one option may have been a case study which would have involved multi-method data gathering e.g. diary entries, observations, repeated interviewing and longitudinal surveys. Freund et al (2005) also encountered similar access restrictions when modelling information behaviour of software engineers and therefore embarked on gathering only interview data.

The research participants, as providers of information, interacted with health-related data and information. They followed established procedures within the organisation, there were no profit-making aspirations that influenced their information behaviour, and there were no communities of practice present in the organisation that could additionally influence their behaviour. The service they provided were either free or, in exceptional cases, for minimal cost recovery. As there was no comparison with other types of information providers it must be emphasised that the model of information behaviour is valid only for the specific organisation – ISD – under study.

In an effort to ensure that there was a balance between the psychological considerations of information behaviour and the core and associated information behaviours of the information workers, the study did not focus on the affective-cognitive experiences prior to engaging in the information behaviours, as conceptualised in Nahl (2001), to ascertain differences in the affective-cognitive domains pre- and post-information behaviour. It would have been difficult to capture this by interview alone because it would have been challenging for the information workers to describe their retrospective feelings and thoughts before and after their information activities. Diaries would have been better at capturing feelings and thoughts in real time but, as explained earlier, they would have intruded into their work.

The modelling of information behaviour of an information provider involved the use of 4 variables of individual characteristics, namely age group, gender, experience and work role, which were enough independent variables, identified from the literature review, given the size of the population. As Steinerová and Šušol (2007) argue, additional factors such as technological skills, education and language are all considerations when modelling information behaviour. As already discussed in chapter 8, these demographic variables are in addition to other constructs such as personality (Tidwell and Sias 2007, Halder, Roy and Chakraborty 2010), job satisfaction (Pezeshki-Rad and Zamani 2005) and learning/information style and information literacy (Heinström 2000, Bawden 2001, Bawden and Robinson 2002, Markless and Streatfield 2007). These factors may have been precursors to feeling states which may have required further investigation. However, the research was focused on feelings as outcomes of information workers' information behaviours and therefore excluded possible precursors.

There are subtypes of information behaviour, feelings and perceptions that may not have been captured in this study's model of provider information behaviour. For example, in another provider organisation with a different culture and different types of customers, the information workers may engage in different types of information activities and perhaps use different words to express their feelings especially as a large number of words and synonyms exist for describing personal feelings, some of which are listed in Tenopir et al 2008. Nevertheless, the model developed in this research is representative of the experiences of the information workers in ISD and has been validated by the interview participants who provided the initial data for developing the model.

9.3 Implications for further research

The research and its model of information behaviour of an information provider provide numerous research opportunities in library and information science.

The research findings have identified some areas that have raised questions and therefore may require further exploration to further our understanding of the phenomenon of information behaviour of an information provider:

- The associations between individual characteristics and information behaviour presented in section 6.4 provide evidence required for understanding what goes on in an information provider organisation. The findings have indicated that the statistical tests found no evidence of associations between individual characteristics and many of the information behaviour variables. This therefore raises the question about whether hidden variables may have resulted in more evidence of relationships between variables. This is especially important where no associations were found between some pairs of demographic and information behaviour variables (in table 6.9) which could be attributable to a 3rd unknown variable and, according to Buckingham and Saunders (2004), provides opportunities to raise further questions and formulate new ideas. The study has shown that a small sample size imposes restrictions on the range of statistical analyses that could be performed in order to further explore relationships among the variables. Therefore, a survey of a larger population of information workers will facilitate more sophisticated statistical tests with a view to better understanding relationships between variables and therefore what goes on in an information provider organisation. In addition, to enrich the findings, a mixture of qualitative data collection methods on larger samples could take place, e.g. focus groups, more one-to-one interviews, and observations of information workers as they interact with information.
- Feelings of frustration featured prominently in the study's findings. Several questions therefore emerge. Examples are: (i) Are these feelings a healthy response to events that result in positive learning for the future? (ii) Can the feelings adversely affect future behaviours? and (iii) Are feelings of frustration related to feeling anxious and worried? These questions provide research opportunities and will help us better understand the role of feeling states in information behaviour.
- The research identified information behaviour triggers as originating from others or from within the self. However, what may require further exploration is the influence of the type of trigger on information behaviour which will further our

understanding of the initiation of information behaviours within information provider organisations.

The research in its entirety also provides general areas of further research which will help to generalise the findings. Examples are:

- To compare feelings, emotions and cognitions before and after an information activity. This will provide an understanding of the level of influence of information behaviour on feeling states and cognitions, and vice versa, thereby enhancing the present study's findings of the relationships between variables.

- To investigate the role of other individual attributes such as personality, education, information/learning style, job satisfaction in influencing information behaviour. This will provide more evidence to a manager in an information provider organisation for making decisions. It can also provide useful information when designing information services. The findings of the study have shown that the influences of individual characteristics on information behaviour remain an open matter and more investigations are required. Although there is evidence in the literature of studies that focus on the relationship between individual characteristics and information behaviour, some of which are reviewed in section 2.4.2.2, the studies mainly focus on information seeking behaviour or research participants who are not information providers, thus creating a gap in LIS.

- To extend the model of information behaviour to include the use of information by the information recipient and the characteristics and value of the feedback loop. This will facilitate not only what happens within the provider's internal information environment, but the interactions with the external environment as well, thus enhancing knowledge of the value of the information service or product. The model can be linked to existing models of information seeking behaviour and also to existing models of communication. These opportunities can add to the evidence required by a manager for introducing change and making decisions that are related to enhancing the service provided to customers.

- To replicate the study across different types of information providers in order to understand which information behaviours occur across all providers and classify the ones that occur in only certain types of providers. This could facilitate the development of a comprehensive model of provider information behaviour which could be used by managers across different types of provider organisations.

9.4 Contribution to information practitioners

This section presents the contributions of the findings of the research to information practitioners. Section 9.4.1 focuses on information practitioners within ISD and section 9.4.2 focuses on LIS practitioners in general.

9.4.1 Contribution to practitioners in ISD

Over the past few years, the demand for near real-time management information by healthcare provider organisations and the Scottish Government to support decision making has been increasing. Some of the drivers for this demand are the Scottish Government's eHealth Strategy 2011-2017 (The Scottish Government 2011) and The Healthcare Quality Strategy for NHSScotland (The Scottish Government 2010). With ISD being the central repository of national healthcare activity data with unique expertise in providing health and social care information and intelligence, it is important that the organisation positions itself to meet the quality of care challenges set out in the strategy documents. This should include a goal of ensuring that the information products and information services provided have the right quality that will be valued by the end-user so that effective decision-making that affect the lives of patients can take place.

To ensure the high quality of products and services, the model presented in this study gives a snapshot of the information behaviours that take place within ISD. It also provides the human dimensions to the behaviours in the organisation – that is, feelings as outcomes of information behaviour and subjective opinions of information workers in relation to the impact of their information behaviours. In addition, the categories of customers of information and the information sources that the information workers access are revealed within the model. Together, the variables provide a comprehensive positive picture of information interactions in ISD that can be further examined to prioritise the value-adding information interactions and optimise swift delivery of information products and services that are timely, client-centred, effective, efficient and accurate.

This exploration of information behaviours, feelings and perceived impact has never been done before in ISD and the findings therefore provide evidence of information interactions within ISD that can be used to facilitate enhanced information service provision.

Information acquisition behaviour that comprises seeking, finding and retrieval behaviours provide insights into the range of information activities for bringing data and information into the provider organisation. The information provider can review these activities with a view to determining how information systems can be designed to include decision support mechanisms for accelerating information acquisition and adding value to the process. For

example, there was evidence in the interviews of much of consulting, clarifying and figuring out activities which involved contact time and frequent communication with the customer. These activities could be examined in depth to determine their relevance and value and whether technological solutions could streamline the activities.

Checking as a subtype of information production behaviour was found to be a very common activity that many information workers engaged in. Accuracy is one of the hallmarks of the outputs from the study location. Nevertheless, the high levels of checking activities provide opportunities for the information provider to determine whether over-checking is taking place and whether the checking process can be streamlined so as to be faster and more structured while remaining accurate. This will facilitate an acceleration of the flow of information through the production process with enhanced value for the customer.

Information dissemination behaviour comprised much transmission of information by physical and electronic means from the information worker to the customer. This provides opportunities for the information provider to revisit these behaviours to determine whether publishing more information results in more 'information pull' by the customer, than 'information push' by the provider. This should result in reduced email and telephone transmission of information to customers, thus freeing up the practitioners' time to engage in other urgent work. There would therefore be the potential for adding value to the service provided to customers because they would have ready access at any time to online information.

9.4.2 Contribution to LIS practitioners in general

The research contributes to LIS practitioners as follows:

- The study provides evidence of the magnitude of multitasking and collaborating information behaviours in an information provider organisation. It shows that use of collaborative tools was limited to emailing. There was no opportunity for information workers to use blogs, wikis, instant messaging and other Web 2.0 tools such as Twitter and Google Docs. This may require an information provider to assess the situation and determine whether solutions such as Web 2.0 technologies may be necessary to facilitate collaborations in order to enhance value for the customers. In addition, an information provider might want to investigate whether multitasking information behaviour facilitates increased productivity at the expense of increased stress or whether the quality of the outputs decreases as a result of frequent task switching and not enough focus on

single information activities. Authors such as McIntyre et al (2001) have described examples of displays in office environments for facilitating multitasking behaviours.

- The research reveals information interactions in a specific information provider organisation of which some were either unknown to LIS practitioners or very little was known about them. This knowledge can help practitioners better understand their own contexts by transferring the learning gained from the findings of this research.

- An understanding of the model of provider information behaviour can facilitate the mapping of information behaviours, feeling states and perceptions in a structured way in different contexts so as to help a manager with responsibility for making changes. The feeling states can be indicators of job satisfaction, motivation and stress which are variables that may be useful in the management of information services.

- With emotions having the ability to motivate individuals to behave in certain ways (Wade and Tavris 2010), the model enables a practitioner to have a better understanding of the strengths and weaknesses of their internal environment for facilitating strategic planning.

- Lean is an increasingly popular improvement and change methodology embraced by a wide range of service and manufacturing organisations. Its aim is to maximising value with fewer resources and minimum waste (Womack and Jones 2005, Sayer and Williams 2012). Lean focuses on the value stream of activities in an organisation and ensures that a product or service of desired value is produced and delivered from the provider to the customer (Joint Commission Resources 2008). The model of information behaviour of an information provider in the study not only provides evidence of ISD's information activities necessary for informing organisational lean improvement processes, but provides learning to other practitioners who may want to embark on Lean improvement processes within their organisation.

- The model of information behaviour of an information provider shows the range of sources of information that the information workers access. Some of these sources are external to the organisation. Similar lists of sources of information can be developed by other practitioners. They provide an opportunity for the information provider to ask itself a number of questions as follows – Is it costing the organisation a lot of money to access these external sources of information? Why don't we have access to most of the information in-house? Is optimal use being made of all the resources and expertise we have within the organisation? Do we know our employees very well and can we therefore tap into their knowledge and skills? Can we encourage the creation of communities of practice and action learning sets to share best practice and problem solve real cases?

- The information workers have indicated their perceptions of how their information behaviour impacts the internal environment of the organisation. The practitioner can use this information to gauge morale of their information workers and could take steps to address any negative perceptions and thereby enhance the quality of the information tasks undertaken by the information workers.

9.5 Original contribution to knowledge

This study has revealed insights of complex information interactions in a specific information provider organisation. This type of organisation has not been identified in LIS literature. The insights have not only provided a snapshot of what goes on in one organisation, as represented in a model, but can help us in the journey towards a comprehensive model of provider information behaviour applicable to any information provider environment.

A new understanding of what goes on within one provider organisation has been revealed. The study presents information seeking, finding and retrieving behaviours as being congruent and therefore subtypes of information acquisition behaviour which, in turn, is a type of information behaviour. These concepts have not been presented in this way in the literature and the study also enhances our understanding of the place of information seeking behaviour, a popular concept in LIS literature, within the domain of information behaviour.

Information dissemination behaviour is also presented as comprising a number of subtypes such as presenting, transmitting, publishing and cascading. This new categorisation of information dissemination adds to our understanding of information dissemination practices. What happens to information after it has been acquired and before it is disseminated is referred to, in this study, as information production behaviour, a term adapted from the discipline of economics. The term helps to bridge the gap in knowledge about the middle stage of the information journey through an information provider. This gap, as explained in chapter 1, has been raised by information science scholars.

Perceived internal impact is another contribution to knowledge in relation to models of information behaviour. This is a new conceptualisation of the thoughts and opinions of information workers which, as this study argues, is critical for understanding what goes on within an information provider organisation. The role of information practitioners' feelings that emerge from conscious emotions and automatic affect has been shown to be an important consideration for any astute information services manager who wants to keep

an eye on their organisation by understanding information interactions and making inferences about employer-employee relationships, employee performance, reactions to change, and quality of information service.

The information behaviour categories, information sources and customers, feelings as outcomes of information behaviour, and perceived impact of information behaviour, as revealed in this study, provide useful contributions to knowledge. There are opportunities for further research within LIS discipline for exploring the concepts and understanding their relationships in depth, as described in section 9.3. For example, relationships between feelings and information behaviours in an information provider setting can provide evidence for an information services manager who wants to make major changes in work configuration that may affect the resilience, motivation and future behaviours of the staff, and therefore the quality of service provided for the customers. The three-dimensional model of information behaviour, as presented in chapter 7, provides a conceptualisation of information interactions that can be useful, in LIS curriculum, for teaching the complexity of information behaviours to LIS students. The range of sub-categories of information behaviour and their interactions enable an information practitioner to review their practices with the intention of proving a better level of service for customers. For example, were there to be much collaborating within the provider organisation that is perceived as being useful, then perhaps the use of more collaborative tools may enhance their practice. Likewise, were there to be common deep-seated feelings of frustration emerging after many information interactions within the information environment, then perhaps incident review therapeutic group sessions may help information practitioners share experiences, reflect on, and improve, their practice and information competency levels.

The model developed in this study contributes to knowledge by developing our thinking of how sub-categories of information behaviour are represented. The model extends and develops Wilson's (1999a) nested model of information behaviour to include more nests of information behaviour types as depicted as prolate spheroids in chapter 7. These spheroids have permeable surfaces and continually move and interact with their internal and external environments, thus depicting complex information interactions rather than two-dimensional linear interactions. The model also extends Kuhlthau's (2004) model of information search process and Yeh's (2008) model of information behaviour by revealing a wider range of emotional responses by information practitioners across different modes of information behaviour.

The novel approach to mixed methods research underpinned by the philosophy of pragmatism as adopted in this study is a new addition to the repertoire of research

methodologies in LIS literature. The combination of critical incident interviewing within a Heideggerian phenomenological framework informed by Colaizzi (1978) which is sequentially augmented with a survey design, and ends with a respondent validation workshop, while being viewed through the philosophical lens of pragmatism, should be of interest in LIS literature that does not commonly label its methods as mixed methods research even when mixed methods are employed. Returning to the participants via a workshop in order to co-create a model of information behaviour adds to the value of the methodology. As explained in section 4.3.5.1, this study has learnt from the usefulness of the application of phenomenology in the nursing discipline to unravel lived experiences and further our understanding of information behaviour in LIS where such an approach is not often used. The relationships between a care giver (in nursing) and a care provider (in LIS) as well as between a care recipient (in nursing) and an information consumer or recipient (in LIS) are therefore highlighted with regard to the argument that both information providers and information consumers should be given equal consideration in studies of information behaviour. The methodology in this study can contribute to LIS teaching and count towards the journey of mixed methods research from its current phase of adolescence (Leech and Onwuegbuzie 2010) to adulthood.

The insights from this study and the value of their applicability as set out in this section make useful and original contributions to knowledge.

9.6 Concluding remarks

This study makes no claim that all types of information behaviour of information providers are represented in the model of provider information behaviour. What the study does is represent, in a model, the experiences of information behaviour of information workers in a specific health-related information provider organisation, elements of which can be used in LIS practice and add to practitioner knowledge. In addition, it prepares the grounds for future researchers to move towards a comprehensive model of information behaviour that can be useful to any information provider organisation as well as linking the model to other models of end-user information behaviour.

Despite the limitations of the research, opportunities have been provided for further studies to investigate some of the concepts that have emerged from the study such as the exploration of associations between individual characteristics and the provider information behaviours in a larger sample of information workers, the triggers of information behaviours and their role in influencing information behaviour, linking the model of information behaviour with other models that focus on the external user of information so

as to better understand the entire information journey, and the role of feelings and individual characteristics before and after information interactions.

As shown in this chapter, the findings of the research have implications well beyond ISD and the research has made a significant contribution to library and information science. The co-created model of information behaviour of an information provider, which has been a product of a novel mixed methods sequential exploratory design, has revealed insights about an information provider which could make a positive difference in the decision-making processes of managers of information services who have responsibility for introducing change and making improvements to information products and services. In turn, this should help the provider organisation cope with changes in its external information user environment and provide a better understanding of information interactions and experiences of information providers.

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APPENDICES

Appendix 1: Philosophical Framework

Assumptions	Overall inquiry - Mixed Methods	Phase 1 of inquiry - Qualitative	Phase 2 of inquiry - Quantitative
Ontology What is there to know? What is the nature of reality?	"**Diverse viewpoints** regarding social realities" (Teddlie and Tashakkori 2009, p. 88)	**Multiple viewpoints** that constitute subjects' reality and the way they view the world (Chell 1998).	**A fugacious reality** is formed which can be observed and measured. This reality is not an absolute truth and is understood imperfectly (Teddlie and Tashakkori 2009). This fugacious reality is best member-checked to enhance rigour.
Epistemology The philosophy of what and how we can know about what we want to know. It informs the philosophical stance	**Intersubjectivity** The duality of going back and forth between subjectivity and objectivity depending on the stage of the research cycle (Morgan 2007)	**Subjectivism** Researcher has subjective meanings of the social phenomenon (Saunders, Lewis and Thornhill 2009)	**Modified objectivism** Researcher creates distance and impartiality but sensitive to personal biases (Creswell 2009, Bachman and Schutt 2010)
Philosophical stance that lies behind the methodology.	**Pragmatism** Not committed to one system of philosophy; pluralistic (Creswell 2009).	**Interpretivism** "Interpret the social roles of others in accordance with our own set of meanings … and understand their world from their point of view" (Saunders, Lewis and Thornhill 2009, p.116).	**Post-positivism** "The understanding of the reality is limited by its complexity and by the biases and other limitations of researchers" (Bachman and Schutt 2010, p. 74).
Axiology The role of values of the researcher	"**Values** play a large role in interpreting results" Saunders, Lewis and Thornhill (2009, p.119).	Research is "**value-bound**" Saunders, Lewis and Thornhill (2009, p.119).	Research is **value-laden** but there may be some control of the influence of values (Teddlie and Tashakkori 2009, Saunders, Lewis and Thornhill 2007)
Logic Connection of theory and data)	**Abductive** Moves back and forth between induction and deduction (Morgan 2007)	**Inductive** Qualitative data driven, understanding of meanings humans attach to events (Saunders, Lewis and Thornhill 2009)	**Deductive** Formal approach, influenced by theory. Operationalisation of concepts to ensure clarity (Saunders, Lewis and Thornhill 2009)
Methodology – The practice of what and how we can know about what we want to know. "Governs our choice and use of methods" (Crotty 1998, p. 2).	**Mixed Methods Research** QUAL → quan (qualitatively driven sequential mixed methods)	**Phenomenology** Heideggerian phenomenology informed by Colaizzi (1978). Captures thought processes, frame of reference and feelings about incidents which have meaning for the respondent (Chell 1998)	**Descriptive Survey Research** Using standardised questions to gather statistical data about attributes, perceptions, feelings of a population and testing for any significant relationships (Buckingham and Saunders 2004, p. 13)

Appendix 2: Interview Protocol

1. Introduction and Aim of Interview

Thank you very much for agreeing to take part in this interview. I am using an interview technique known as the critical incident technique as part of my PhD research at Robert Gordon University. The study, as you know, is about understanding information behaviour of information services staff.

I would like this interview to last between 60-90 minutes. As I have already discussed with you, your participation is voluntary and you may wish to terminate the interview or refuse to answer any question at any stage during the interview. No part of our conversation will be attributable to you. The anonymous conversation will be digitally recorded, transcribed and coded in order for me to develop themes and categories for moving to the next stage of my research. I will also occasionally be taking down notes which would help me when I am listening to the audio recording afterwards. Should you inadvertently mention any names of individuals or reveal any particularly sensitive information during the interview, I will remove them from the transcribed text so as to protect confidentiality. I will provide you with a copy of the transcribed conversation for you to sense check and return with amendments if you so wish.

The aim of this interview is two-fold. First, I would like to obtain some demographic information from you as well as determine your understanding of the concept of information, the information sources you use and the customers you respond to. In this part, I will ask you a series of questions. Secondly, I would like you to take me through detailed examples of information activities you engage in when getting information or data, what you do with it and how you give away the information, together with your experiences and perceptions of the immediate outcome of these activities and the longer time effects of these activities.

Do you have any questions about what I've said so far? Do you still want to participate?

2. Personal Information

- How long have you working in an information intensive environment?
- Describe the principal function of the area you work in?
- What do you understand by 'information'?
- What role does information play in your professional life?
- Who are the customers of the information you interact with?
- What, or who are, your sources of information/data in the course of your work?

3. Getting information or data

- Think of a time when, in response to a need for information, you found, accessed or captured information or raw data with success to satisfy the need. What activities did you engage in?
- Think of a time when, in response to a need for information, you found, accessed or captured information or raw data with difficulty or without success to satisfy the need. What activities did you engage in?
- Could you please give me more examples?
- Do you have anything else you would like to add?

Follow-up:

- Were the tasks shared? Did you need help?
- Did you find information by accident?
- Were you doing more than one task at the same time? How?
- Any obstacles?
- What did you do next?
- Did you have to repeat what you had already done?
- What was going through your mind?
- How did you feel about the experience?
- How satisfied were you about the outcomes?
- What do you feel the more long term effects on you or your colleagues or the organisation would be?
- Would like to add anything else?

4. Having got information/data, what do you do with it?

- Think of a time when, with information or raw data available to you, you did several things to them with success in trying to make them useful. What activities did you engage in?
- Think of a time when, with information or raw data available to you, you did several things to them with difficulty or without success in trying to make them useful. What activities did you engage in?
- Could you please give me more examples?
- Do you have anything else you would like to add?

Follow-up:

- Were the tasks shared? Did you need help?
- Were you doing more than one task at the same time? How?
- Any obstacles?
- What did you do next?
- Did you have to repeat what you had already done?

- Did you have to go back and get more information?

- What was going through your mind?

- How did you feel about the experience?

- How satisfied were you about the outcomes?

- What do you feel the more long term effects on you or your colleagues or the organisation would be?

- Would like to add anything else?

5. Giving information away

- Think of a time when you were at the end stage of meeting the requirements of the need for information and you succeeded in making information available to those who required it. What activities did you engage in?

- Think of a time when you were at the end stage of meeting the requirements of the need for information and found it difficult or did not succeed in making information available to those who required it. What activities did you engage in?

- Could you please give me more examples?

- Do you have anything else you would like to add?

Follow-up:

- Were the tasks shared? Did you need help?

- Were you doing more than one task at the same time? How?

- Any obstacles?

- What did you do next?

- Did you have to repeat what you had already done?

- Did you have to go back and get more information?

- Did you have to go back and change what you had already got?

- What was going through your mind?

- How did you feel about the experience?

- How satisfied were you about the outcomes?

- What do you feel the more long term effects on you or your colleagues or the organisation would be?

- Would like to add anything else?

6. Conclusion

- If you feel anyone else in your team may have something else to contribute, can you recommend a colleague for interview?

- Do you have any questions?

- Thank you very much for participating.

Appendix 3: Informed Consent Form

Informed Consent Form for Research Interview
1. I confirm that the Richmond Davies has explained the purpose of his research to me and I have had the opportunity to ask him questions.
2. I agree to participate in Richmond Davies's PhD study – Information Behaviour of an Information Provider.
3. My participation is voluntary.
4. I can withdraw from the study at any time and there will be no repercussions.
5. I understand that, while interview quotes may be used in the thesis which will be published, my identity will not be revealed and my anonymity will be preserved.
6. I am happy with the assurances received that the interview audio recording and transcripts will be kept securely to ensure confidentiality.
7. I understand that the audio recording and transcripts of my interview will be destroyed by Richmond Davies on conclusion of his analysis and PhD research report.
Name of participant: Signature of participant: Date:
Signature of researcher: Date:

Appendix 4: An Email Confirming Interview Consent

From: ██████████████████
Sent: 8 December 2008 10:58
To: Davies, Richmond
Subject: Interview for PhD research

Hi Richmond,

Please see the attached completed consent form. I've just written my name where the signature should be. Hope that's okay. Thanks for sending the make-meeting request for the interview and I am rather looking forward to it!

If there's anything else you need, just give me a shout.

Regards,

████████████████████

Appendix 5: An Email Confirming Completion of Survey Pilot

From: ███████████████
Sent: 31 May 2010 14:06
To: Davies, Richmond
Subject: RE: Participation in pilot of survey questionnaire

Just filled in the questionnaire and provided minor comments where necessary.

I have a couple of observations. I think you need to be clearer within the questionnaire itself about the stages involved. Maybe a blurb at the start saying that there are three stages to information processing: seeking/acquiring, producing, disseminating and that you are interested in the variety of methods that people employ at each stage. Further, you are also interested in discovering about the range of emotional responses that people have during each stage of information processing. I think if you included a short blurb like this, it would fend off the attitude that some people may have where they say 'this questionnaire is repetitive, he keeps asking the same thing'. For example, even though I know the broad scope of your study from having had discussions with you about it, I still managed to fill in the first set of responses (seeking/acquiring) as if I was thinking about the whole process. A clear blurb at the beginning would have prevented this. I imagine those with less of a personal interest in your study will not have the appetite to persist beyond this point unless it is made very clear to them why you're asking the same set of questions.

Apart from that, I think the questionnaire is logical in its structure. I enjoyed responding to the range of emotions you had on the form. It is so different completing the questionnaire compared to when I was commenting on each of the variables.

Hope you don't view this is as a machine gunning of the questionnaire. I'm just trying to help as I remember seeking feedback from colleagues during my postgrad research.

███████████

From: Davies, Richmond
Sent: 31 May 2010 12:58
To: Davies, Richmond
Subject: Participation in pilot of survey questionnaire

[Names of recipients withheld]

Dear all,

Thanks for agreeing to test my pilot questionnaire which should take you about 15 minutes. Please answer all questions but note that the last question is optional. I'll be grateful if you could complete it by the end of this week (**by 4th June**) and provide me with comments, if you have any.

To remind you, the purpose of this pilot is to get feedback from you about the survey instrument's format, length, sequence of questions and instructions so that I can address any comments you may have and develop a final questionnaire. As there are only 10 of you, you are under no obligation to provide accurate responses to the demographic-type questions but please make sure all the other closed questions are answered. You will notice that the questionnaire is directed at DIG as they are my study population.

The URL is http://bit.ly/bCzZf9

Enjoy!

Many thanks,

Richmond

Appendix 6: Final Online Survey Questionnaire

Survey of Information Activities

I am a PhD research student at Robert Gordon University engaged in a study about understanding the information behaviour of an information provider.

I hope this short survey will help you to reflect on your day-to-day work-related information activities as you complete it. Your responses will remain anonymous and your cooperation is highly appreciated. The survey takes less than 15 minutes to complete and comprises 15 mandatory questions across 6 sections plus 1 question per section for you to provide optional comments about each section.

This questionnaire focuses on 3 clusters of core information activities in ISD: seeking/acquiring information, producing information and disseminating information. For each of these clusters, you will be asked questions about how frequently you engage in the activities, your emotional responses to the activities, and how you perceive the impact of the activities you engage in. So a number of questions will be repeated. The questionnaire also captures your associated activities of multitasking, collaborative working, and also your demographic details.

In presenting the outputs of the statistical analysis, if small numbers exist that may be potentially disclosive, cells will be collapsed to maintain confidentiality. With the output from this survey, I plan to develop a structure that represents information workers' experiences of information behaviour.

Thank you for your cooperation.

Richmond Davies
Email: r.davies@rgu.ac.uk
Tel: extension 6195

Please check this box to confirm your willingness to take part: ◯

Section 1

This section is about the customers of your data/information. *Please answer all parts of the question with an asterisk (*).*

[Q1] Please indicate how frequently the following are direct customers of the data/information you handle. *
Please choose the appropriate response for each item:

	Never	Hardly ever	Some of the time	Most of the time
Patients	◯	◯	◯	◯
NHS organisations (incl. healthcare providers)	◯	◯	◯	◯
Local authorities (incl. social services)	◯	◯	◯	◯
Scottish Government	◯	◯	◯	◯
Private organisations	◯	◯	◯	◯
Universities / Research bodies / Researchers	◯	◯	◯	◯
Voluntary organisations	◯	◯	◯	◯
Royal colleges and other professional bodies	◯	◯	◯	◯
IT/Systems developers	◯	◯	◯	◯
The media	◯	◯	◯	◯

	Never	Hardly ever	Some of the time	Most of the time
The general public	○	○	○	○
Other national organisations (e.g. Information Centre in Leeds)	○	○	○	○
Colleagues within the organisation	○	○	○	○

[Com1] Please provide comments, if any, on the above questions
Please write your answer here:

Section 2
This section comprises questions about you seeking/acquiring information. *Please answer all parts of all questions with an asterisk (*).*

[Q2] How frequently do you engage in the following activities when seeking or acquiring data/information? *

Please choose the appropriate response for each item:

	Never	Hardly ever	Some of the time	Most of the time
Browsing the internet	○	○	○	○
Searching - Using specific search terms to look for information online	○	○	○	○
Delegating (using other people's help to seek or acquire data/information)	○	○	○	○
Capturing (e.g. by a data collection scheme)	○	○	○	○
Clarifying details with others	○	○	○	○
Consulting (i.e. with others to get feedback)	○	○	○	○
Emailing	○	○	○	○
Encountering (accidentally bumping into useful information during an active search for some other information)	○	○	○	○
Figuring out (e.g. thinking)	○	○	○	○
Telephoning	○	○	○	○
In-depth reading	○	○	○	○
Skim reading	○	○	○	○
Retrieving data (e.g. from database or data warehouse or information system)	○	○	○	○
Scanning the wider information environment for items of interest	○	○	○	○

[Q3] How frequently do you experience these feelings and emotions as a result of seeking or acquiring data/information? *

Please choose the appropriate response for each item:

	Never	Hardly ever	Some of the time	Most of the time
Encouraged	○	○	○	○
Rewarded	○	○	○	○
Reassured	○	○	○	○
Happy	○	○	○	○
Togetherness (e.g. camaraderie)	○	○	○	○

	Never	Hardly ever	Some of the time	Most of the time
Excited	○	○	○	○
Relieved	○	○	○	○
Proud	○	○	○	○
Pleased	○	○	○	○
Determined (desire to persevere or press on)	○	○	○	○
Sense of accomplishment	○	○	○	○
Confident	○	○	○	○
Good	○	○	○	○
Satisfied	○	○	○	○
Confused	○	○	○	○
Uncomfortable	○	○	○	○
Overwhelmed	○	○	○	○
Hopeless	○	○	○	○
Annoyed	○	○	○	○
Tired	○	○	○	○
Disappointed	○	○	○	○
Frustrated	○	○	○	○
Anxious	○	○	○	○
Worried	○	○	○	○
Neutral feelings	○	○	○	○

[Q4] The following statements describe how your activities of seeking or acquiring data/information impact on you, or your colleagues, or your organisation. Please indicate the strength of your agreement. *

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Processes are improved (e.g. better decision-making, being proactive, being more efficient, better customer service)	○	○	○	○	○
Reputation is enhanced	○	○	○	○	○
Lessons are drawn from the experience of the information activity	○	○	○	○	○
Organisation is a key influencer of national policies	○	○	○	○	○
Staff are motivated	○	○	○	○	○
Good relationships are established	○	○	○	○	○
Information sharing culture is established	○	○	○	○	○
Others are blamed when outcome is undesirable (e.g. shifting responsibility to others when something goes wrong)	○	○	○	○	○
Others not directly involved in the activity are deskilled	○	○	○	○	○

[Com2] Please provide comments, if any, on the above questions.

Please write your answer here:

Section 3

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This section comprises questions about you producing information. *Please answer all parts of all questions with an asterisk (*).*

[Q5] How frequently do you engage in the following activities when producing information for a particular purpose? *

Please choose the appropriate response for each item:

	Never	Hardly ever	Some of the time	Most of the time
Analysing (using analytical techniques)	○	○	○	○
Checking (e.g. validating, proof reading, quality assurance)	○	○	○	○
Comparing	○	○	○	○
Formatting	○	○	○	○
Integrating (bringing items of data/information together)	○	○	○	○
Separating (e.g. taking out, filtering, isolating) data/information	○	○	○	○
Refining (making changes e.g. editing, deleting, reviewing)	○	○	○	○
Interpreting	○	○	○	○
Manipulating data	○	○	○	○
Writing /preparing reports/documents	○	○	○	○
Making sure the data/information are secure	○	○	○	○
Storing the data/information	○	○	○	○
Transforming the data/information (e.g. converting, coding, classifying, standardising)	○	○	○	○

[Q6] How frequently do you experience these feelings and emotions as a result of producing information? *

Please choose the appropriate response for each item:

	Never	Hardly ever	Some of the time	Most of the time
Encouraged	○	○	○	○
Rewarded	○	○	○	○
Reassured	○	○	○	○
Happy	○	○	○	○
Togetherness (e.g. camaraderie)	○	○	○	○
Excited	○	○	○	○
Relieved	○	○	○	○
Proud	○	○	○	○
Pleased	○	○	○	○
Determined (desire to persevere or press on)	○	○	○	○
Sense of accomplishment	○	○	○	○
Confident	○	○	○	○
Good	○	○	○	○
Satisfied	○	○	○	○
Confused	○	○	○	○
Uncomfortable	○	○	○	○
Overwhelmed	○	○	○	○

	Never	Hardly ever	Some of the time	Most of the time
Hopeless	○	○	○	○
Annoyed	○	○	○	○
Tired	○	○	○	○
Disappointed	○	○	○	○
Frustrated	○	○	○	○
Anxious	○	○	○	○
Worried	○	○	○	○
Neutral feelings	○	○	○	○

[Q7] The following statements describe how your activities of producing information impact on you, or your colleagues, or your organisation. Please indicate the strength of your agreement. *

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Processes are improved (e.g. better decision-making, being proactive, being more efficient, better meeting needs of customers)	○	○	○	○	○
Reputation is enhanced	○	○	○	○	○
Lessons are drawn from the experience of the information activity	○	○	○	○	○
Organisation is a key influencer of national policies	○	○	○	○	○
Staff are motivated	○	○	○	○	○
Good relationships are established	○	○	○	○	○
Information sharing culture is established	○	○	○	○	○
Others are blamed when outcome is undesirable (e.g. shifting responsibility to others when something goes wrong)	○	○	○	○	○
Others not directly involved in the activity are deskilled	○	○	○	○	○

[Com3] Please provide comments, if any, on the above questions.

Please write your answer here:

Section 4

This section comprises questions about you disseminating information. *Please answer all parts of all questions with an asterisk (*).*

[Q8] How frequently do you engage in the following activities when disseminating information? *

Please choose the appropriate response for each item:

	Never	Hardly ever	Some of the time	Most of the time
Cascading information (i.e. sending information out so that others can distribute it	○	○	○	○
Making information available online (e.g. publishing on ISD website)	○	○	○	○

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	Never	Hardly ever	Some of the time	Most of the time
Presenting information formally (e.g. at conferences, seminars, formal meetings)	○	○	○	○
Presenting information informally (e.g. at informal meetings, to team colleagues, giving advice)	○	○	○	○
Transmitting information by physical or electronic means (e.g. posting out information, emailing information, transferring information)	○	○	○	○

[Q9] How frequently do you experience these feelings and emotions as a result of disseminating information? *

Please choose the appropriate response for each item:

	Never	Hardly ever	Some of the time	Most of the time
Encouraged	○	○	○	○
Rewarded	○	○	○	○
Reassured	○	○	○	○
Happy	○	○	○	○
Togetherness (e.g. camaraderie)	○	○	○	○
Excited	○	○	○	○
Relieved	○	○	○	○
Proud	○	○	○	○
Pleased	○	○	○	○
Determined (desire to persevere or press on)	○	○	○	○
Sense of accomplishment	○	○	○	○
Confident	○	○	○	○
Good	○	○	○	○
Satisfied	○	○	○	○
Confused	○	○	○	○
Uncomfortable	○	○	○	○
Overwhelmed	○	○	○	○
Hopeless	○	○	○	○
Annoyed	○	○	○	○
Tired	○	○	○	○
Disappointed	○	○	○	○
Frustrated	○	○	○	○
Anxious	○	○	○	○
Worried	○	○	○	○
Neutral feelings	○	○	○	○

[Q10] The following statements describe how your activities of disseminating information impact on you, or your colleagues, or your organisation. Please indicate the strength of your agreement. *
Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Processes are improved (e.g. better decision-making, being proactive, being more efficient, better meeting needs of customers)	○	○	○	○	○
Reputation is enhanced	○	○	○	○	○

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Lessons are drawn from the experience of the information activity	○	○	○	○	○
Organisation is a key influencer of national policies	○	○	○	○	○
Staff are motivated	○	○	○	○	○
Good relationships are established	○	○	○	○	○
Information sharing culture is established	○	○	○	○	○
Others are blamed when outcome is undesirable (e.g. shifting responsibility to others when something goes wrong)	○	○	○	○	○
Others not directly involved in the activity are deskilled	○	○	○	○	○

[Com4] Please provide comments, if any, on the above questions.

Please write your answer here:

Section 5
This section is about your associated information activities of multitasking and collaborative working.

[Q11] When you engage in the core information activities of seeking/acquiring, producing and disseminating information, how often do you engage in the following associated activities? *

Please choose the appropriate response for each item:

	Never	Hardly ever	Some of the time	Most of the time
Multitasking - engaging in simultaneous activities (e.g. skim reading while speaking on the phone)	○	○	○	○
Multitasking - interrupting activities with other activities and resuming previous activities	○	○	○	○
Collaborating with peers	○	○	○	○
Collaborating with specialists or experts	○	○	○	○
Collaborating because you must do so as part of the work process	○	○	○	○

[Com5] Please provide comments, if any, on the above questions.

Please write your answer here:

Section 6
... and finally, this last section mainly captures your personal details. *Please answer all questions with an asterisk (*).*

[Q12] Please indicate your sex. *

Please choose **only one** of the following:

○ Female

○ Male

[Q13] How many years have you been working in ISD? *

Please choose **only one** of the following:

○ 1 year or less

○ 2 years

○ 3 years

○ 4 years

○ 5 years

○ 6 years

○ 7 years

○ 8 years

○ 9 years

○ 10 years

○ 11 years

○ 12 years

○ 13 years

○ 14 years

○ 15 years

○ 16 years

○ 17 years

○ 18 years

○ 19 years

○ 20 years

○ 21 years

○ 22 years

○ 23 years

○ 24 years

○ 25 years

○ 26 years

○ 27 years

○ 28 years

○ 29 years

○ 30 years

○ 31 years

○ 32 years

○ 33 years

○ 34 years

○ 35 years

[Q14] What is your main work area? *

Please choose **only one** of the following:

○ Waiting times

○ Analyst team

○ Data Quality Assurance

○ Data Monitoring

○ Information Governance

○ Women and Children Information

○ Health and Social Care Information

○ Practice Team Information

○ Data Standards and Terminology (reference files, dictionary, development, terminology, implementation)

[Q15] Which age group do you belong to? *

Please choose **only one** of the following:

○ < 21 years

○ 21-25 years

○ 26-30 years

○ 31-35 years

○ 36-40 years

○ 41-45 years

○ 46-50 years

○ 51-55 years

○ 56-60 years

○ 61-65 years

○ >65 years

[Com6] Please provide comments, if any, on the above questions.

Please write your answer here:

Thank you ever so much for taking your time to participate in this survey.

Your survey has been submitted anonymously.

If you have any questions about the survey, please contact r.davies@rgu.ac.uk or call extension 6195.

Submit your survey.
Thank you for completing this survey.

Appendix 7: Invitation letter for participating in content validation

I am refining a research instrument for capturing information activities of information workers including the feelings and emotions that arise from their activities and the information workers' perceptions of the long-term effects, within the organisation, of their activities.

As you have some knowledge and, in some cases personal experience, of activities that information workers engage in, you are invited to volunteer as a participant for rating the content of the instrument.

The process involves you giving each of the 151 items a score of 1 to 4 as follows:

      1 – Item not relevant

      2 – Item not relevant because it requires complete change

      3 – Item relevant but requires minor modifications

      4 – Item relevant

You are also required to provide me with comments, if any, about the clarity of any item and if necessary, suggest any additional items. Together with your scores, I will therefore be able to remove, amend or add items that you suggest and thereby refine the instrument for the next stage of pre-testing.

Please see attached a copy of the draft questionnaire, a list of all items and their codes, and a spreadsheet for inputting your score and, if applicable, comment against each item.

Thank you very much.

Regards

Richmond Davies
PhD student
Robert Gordon University
r.davies@rgu.ac.uk

Appendix 8: Coded items and rating scales

Code	Item description	Rating Scale				
		Customers of data/information				
		Never (1)	Hardly ever (2)	Some of the time (3)	Most of the time (4)	
Q1a	Patients	1	2	3	4	
Q1b	NHS organisations (incl. healthcare providers)	1	2	3	4	
Q1c	Local authorities (incl. social services)	1	2	3	4	
Q1d	Scottish Government	1	2	3	4	
Q1e	Private organisations	1	2	3	4	
Q1f	Universities / Research bodies / Researchers	1	2	3	4	
Q1g	Voluntary organisations	1	2	3	4	
Q1h	Royal colleges and professional bodies	1	2	3	4	
Q1i	IT/Systems developers	1	2	3	4	
Q1j	The media	1	2	3	4	
Q1k	The general public	1	2	3	4	
Q1l	Other national organisations **(e.g. Information Centre in Leeds)**	1	2	3	4	
Q1m	Colleagues within the organisation	1	2	3	4	
	Activities when seeking or acquiring data/information					
Q2a	Browsing the internet	1	2	3	4	
Q2b	Searching (using specific search terms to look for information online)	1	2	3	4	
Q2c	Delegating (using other people's help to seek or acquire data/information)	1	2	3	4	
Q2d	Capturing (e.g. by a data collection scheme)	1	2	3	4	
Q2e	Clarifying details with others	1	2	3	4	
Q2f	Consulting with others to get feedback	1	2	3	4	
Q2g	Emailing	1	2	3	4	
Q2h	Encountering (accidentally bumping into useful information during an active search for some other information).	1	2	3	4	
Q2i	Figuring out (e.g. thinking)	1	2	3	4	
Q2j	Telephoning	1	2	3	4	
Q2k	In-depth reading	1	2	3	4	
Q2l	Skim reading	1	2	3	4	
Q2m	Retrieving data from database or data warehouse or information system.	1	2	3	4	
Q2n	Scanning the wider information environment for items of interest	1	2	3	4	
	Feelings and emotions as outcome of acquiring information					
Q3a	Encouraged	1	2	3	4	
Q3b	Rewarded	1	2	3	4	
Q3c	Reassured	1	2	3	4	
Q3d	Happy	1	2	3	4	
Q3e	Togetherness **(e.g. camaraderie)**	1	2	3	4	
Q3f	Excited	1	2	3	4	
Q3g	Relieved	1	2	3	4	
Q3h	Proud	1	2	3	4	
Q3i	Pleased	1	2	3	4	

Code	Item description	Rating Scale				
Q3j	Determined (desire to persevere or press on)	1	2	3	4	
Q3k	Sense of accomplishment	1	2	3	4	
Q3l	Confident	1	2	3	4	
Q3m	Good	1	2	3	4	
Q3n	Satisfied	1	2	3	4	
Q3o	Neutral feelings	1	2	3	4	
Q3p	Uncomfortable	1	2	3	4	
Q3q	Overwhelmed	1	2	3	4	
Q3r	Hopeless	1	2	3	4	
Q3s	Annoyed	1	2	3	4	
Q3t	Tired	1	2	3	4	
Q3u	Disappointed	1	2	3	4	
Q3v	Frustrated	1	2	3	4	
Q3w	Confused	1	2	3	4	
Q3x	**Worried**	1	2	3	4	
Q3y	**Anxious**	1	2	3	4	
	Internal impact of activities of seeking or acquiring information					
		Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
Q4a	Processes are improved **(e.g. better decision-making, being proactive, being more efficient, better customer service)**	1	2	3	4	5
Q4b	Reputation is enhanced	1	2	3	4	5
Q4c	Lessons are drawn from the experience of the information activity	1	2	3	4	5
Q4d	Organisation is a key influencer of national policies	1	2	3	4	5
Q4e	Staff are motivated	1	2	3	4	5
Q4f	Good relationships are established	1	2	3	4	5
Q4g	Information sharing culture is established	1	2	3	4	5
Q4h	Others are blamed when outcome is undesirable **(e.g. shifting responsibility to others when something goes wrong)**	1	2	3	4	5
Q4i	Others not directly involved in the activity are deskilled	1	2	3	4	5
		Never (1)	Hardly ever (2)	Some of the time (3)	Most of the time (4)	
	Activities when producing information					
Q5a	Analysing (using analytical techniques)	1	2	3	4	
Q5b	Checking **(e.g. validating, proof reading, quality assurance)**	1	2	3	4	
Q5c	Comparing	1	2	3	4	
Q5d	Formatting	1	2	3	4	
Q5e	Integrating (bringing items of data/information together)	1	2	3	4	
Q5f	Separating (e.g. taking out, filtering, isolating) data/information	1	2	3	4	
Q5g	Making changes e.g. editing, deleting, reviewing	1	2	3	4	
Q5h	Interpreting	1	2	3	4	
Q5i	Manipulating data	1	2	3	4	
Q5j	Writing /preparing reports/documents	1	2	3	4	
Q5k	Making sure the data/information are secure	1	2	3	4	
Q5l	Storing the data/information	1	2	3	4	

Code	Item description	Rating Scale				
Q5m	Transforming the data/information (e.g. converting, coding, classifying, standardising)	1	2	3	4	
	Feelings and emotions as outcome of acquiring information					
Q6a	Encouraged	1	2	3	4	
Q6b	Rewarded	1	2	3	4	
Q6c	Reassured	1	2	3	4	
Q6d	Happy	1	2	3	4	
Q6e	Togetherness **(e.g. camaraderie)**	1	2	3	4	
Q6f	Excited	1	2	3	4	
Q6g	Relieved	1	2	3	4	
Q6h	Proud	1	2	3	4	
Q6i	Pleased	1	2	3	4	
Q6j	Determined (desire to persevere or press on)	1	2	3	4	
Q6k	Sense of accomplishment	1	2	3	4	
Q6l	Confident	1	2	3	4	
Q6m	Good	1	2	3	4	
Q6n	Satisfied	1	2	3	4	
Q6o	Neutral feelings	1	2	3	4	
Q6p	Uncomfortable	1	2	3	4	
Q6q	Overwhelmed	1	2	3	4	
Q6r	Hopeless	1	2	3	4	
Q6s	Annoyed	1	2	3	4	
Q6t	Tired	1	2	3	4	
Q6u	Disappointed	1	2	3	4	
Q6v	Frustrated	1	2	3	4	
Q6w	Confused	1	2	3	4	
Q6x	**Worried**	1	2	3	4	
Q6y	**Anxious**	1	2	3	4	
	Internal impact of activities of producing information					
		Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
Q7a	Processes are improved **(e.g. better decision-making, being proactive, being more efficient, better meeting needs of customers)**	1	2	3	4	5
Q7b	Reputation is enhanced	1	2	3	4	5
Q7c	Lessons are drawn from the experience of the information activity	1	2	3	4	5
Q7d	Organisation is a key influencer of national policies	1	2	3	4	5
Q7e	Staff are motivated	1	2	3	4	5
Q7f	Good relationships are established	1	2	3	4	5
Q7g	Information sharing culture is established	1	2	3	4	5
Q7h	Others are blamed when outcome is undesirable **(e.g. shifting responsibility to others when something goes wrong)**	1	2	3	4	5
Q7i	Others not directly involved in the activity are deskilled	1	2	3	4	5
	Activities when disseminating information					
		Never (1)	Hardly ever (2)	Some of the time (3)	Most of the time (4)	
Q8a	Cascading information (i.e. sending information out so that others can distribute it	1	2	3	4	
Q8b	Making information available online (e.g. publishing on ISD website)	1	2	3	4	

Code	Item description	Rating Scale				
Q8c	Presenting information formally (e.g. at conferences, seminars, formal meetings)	1	2	3	4	
Q8d	Presenting information informally (e.g. at informal meetings, to team colleagues, giving advice)	1	2	3	4	
Q8e	Transmitting information by physical or electronic means (e.g. posting out information, emailing information, transferring information)	1	2	3	4	
	Feelings and emotions as outcome of disseminating information					
Q9a	Encouraged	1	2	3	4	
Q9b	Rewarded	1	2	3	4	
Q9c	Reassured	1	2	3	4	
Q9d	Happy	1	2	3	4	
Q9e	Togetherness **(e.g. camaraderie)**	1	2	3	4	
Q9f	Excited	1	2	3	4	
Q9g	Relieved	1	2	3	4	
Q9h	Proud	1	2	3	4	
Q9i	Pleased	1	2	3	4	
Q9j	Determined (desire to persevere or press on)	1	2	3	4	
Q9k	Sense of accomplishment	1	2	3	4	
Q9l	Confident	1	2	3	4	
Q9m	Good	1	2	3	4	
Q9n	Satisfied	1	2	3	4	
Q9o	Neutral feelings	1	2	3	4	
Q9p	Uncomfortable	1	2	3	4	
Q9q	Overwhelmed	1	2	3	4	
Q9r	Hopeless	1	2	3	4	
Q9s	Annoyed	1	2	3	4	
Q9t	Tired	1	2	3	4	
Q9u	Disappointed	1	2	3	4	
Q9v	Frustrated	1	2	3	4	
Q9w	Confused	1	2	3	4	
Q9x	**Worried**	1	2	3	4	
Q9y	**Anxious**	1	2	3	4	
	Internal impact of activities of disseminating information					
		Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
Q10a	Processes are improved **(e.g. better decision-making, being proactive, being more efficient, better meeting needs of customers)**					
Q10b	Reputation is enhanced					
Q10c	Lessons are drawn from the experience of the information activity					
Q10d	Organisation is a key influencer of national policies					
Q10e	Staff are motivated					
Q10f	Good relationships are established					
Q10g	Information sharing culture is established					
Q10h	Others are blamed when outcome is undesirable **(e.g. shifting responsibility to others when something goes wrong)**					
Q10i	Others not directly involved in the activity are deskilled					

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Code	Item description	Rating Scale				
		Associated activities of multitasking and collaborating				
		Never (1)	Hardly ever (2)	Some of the time (3)	Most of the time (4)	
Q11a	Multitasking - engaging in simultaneous activities (e.g. skim reading while speaking on the phone)					
Q11b	Multitasking - interrupting activities with other activities and resuming previous activities					
Q11c	Collaborating with peers					
Q11d	Collaborating with specialists or experts					
Q11e	Collaborating because you must do so as part of the work process					
		Demographics				
Q12	Gender	1 Female 2 Male				
Q13	Years of service	≤1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 … 35				
Q14	Main work area	1 Waiting Times 2 Analysts 3 Data Quality Assurance 4 Data Monitoring 5 Information Governance 6 Data Standards and Terminology 7 Women and Children 8 Health and Social care Information 9 Practice Team Information				
Q15	Age group	1 < 21 years 2 21-25 years 3 26-30 years 4 31-35 years 5 36-40 years 6 41-45 years 7 46-50 years 8 51-55 years 9 56-60 years 10 61-65 years 11 >65 years				

Appendix 9: Content Validity Index (CVI) of Survey Items

Key

R1 to R10 = rating scores for each of 10 participants.

1 – Item not relevant

2 – Item not relevant because it requires complete change

3 – Item relevant but requires minor modifications

4 – Item relevant

Item	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	CVI
Q1a	4	4	4	4	4	4	4	4	4	4	1.00
Q1b	4	4	4	4	4	4	4	4	4	4	1.00
Q1c	4	4	4	4	4	4	4	4	4	4	1.00
Q1d	4	4	4	4	4	4	4	4	4	4	1.00
Q1e	4	4	4	4	4	4	4	4	4	4	1.00
Q1f	4	4	4	4	4	4	4	4	4	4	1.00
Q1g	4	4	4	4	4	4	4	4	4	4	1.00
Q1h	4	4	4	4	4	4	4	4	4	4	1.00
Q1i	4	4	4	4	4	4	4	4	4	4	1.00
Q1j	4	4	4	4	4	4	4	4	4	4	1.00
Q1k	4	4	4	4	4	4	4	4	4	4	1.00
Q1l	4	4	3	3	4	4	4	3	4	4	1.00
Q1m	4	4	4	4	4	4	4	4	4	4	1.00
Q2a	4	4	4	4	4	4	4	4	4	4	1.00
Q2b	4	4	4	4	4	4	4	4	4	4	1.00
Q2c	4	4	4	4	4	4	4	4	4	4	1.00
Q2d	4	4	4	4	4	4	4	4	4	4	1.00
Q2e	4	4	4	4	4	4	4	4	4	4	1.00
Q2f	4	4	4	4	4	4	4	4	4	4	1.00
Q2g	4	4	4	4	4	4	4	4	4	4	1.00
Q2h	4	4	4	4	4	4	4	4	4	4	1.00
Q2i	4	4	4	4	4	4	4	4	4	4	1.00
Q2j	4	4	4	4	4	4	4	4	4	4	1.00
Q2k	4	4	4	4	4	4	4	4	4	4	1.00
Q2l	4	4	4	4	4	4	4	4	4	4	1.00
Q2m	4	4	4	4	4	4	4	4	4	4	1.00
Q2n	4	4	4	4	4	4	4	4	4	4	1.00
Q3a	4	4	4	4	4	4	4	4	4	4	1.00
Q3b	4	4	4	4	4	4	4	4	4	4	1.00
Q3c	4	4	4	4	4	4	4	4	4	4	1.00
Q3d	4	4	4	4	4	4	4	4	4	4	1.00
Q3e	3	3	4	4	4	3	3	3	3	4	1.00
Q3f	4	4	4	4	4	4	4	4	4	4	1.00
Q3g	4	4	4	4	4	4	4	4	4	4	1.00
Q3h	4	4	4	4	4	4	4	4	4	4	1.00
Q3i	4	4	4	4	4	4	4	4	4	4	1.00
Q3j	4	4	4	4	4	4	4	4	4	4	1.00
Q3k	4	4	4	4	4	4	4	4	4	4	1.00
Q3l	4	4	4	4	4	4	4	4	4	4	1.00
Q3m	4	4	4	4	4	4	4	4	4	4	1.00
Q3n	4	4	4	4	4	4	4	4	4	4	1.00
Q3o	4	4	4	4	4	4	4	4	4	4	1.00
Q3p	4	4	4	4	4	4	4	4	4	4	1.00
Q3q	4	4	4	4	4	4	4	4	4	4	1.00
Q3r	4	4	4	4	4	4	4	4	4	4	1.00
Q3s	4	4	4	4	4	4	4	4	4	4	1.00

Q3t	4	4	4	4	4	4	4	4	4	4	1.00
Q3u	4	4	4	4	4	4	4	4	4	4	1.00
Q3v	4	4	4	4	4	4	4	4	4	4	1.00
Q3w	4	4	4	4	4	4	4	4	4	4	1.00
Q4a	3	4	3	4	4	3	3	4	4	3	1.00
Q4b	4	4	4	4	4	4	4	4	4	4	1.00
Q4c	4	4	4	4	4	4	4	4	4	4	1.00
Q4d	4	4	4	4	4	4	4	4	4	4	1.00
Q4e	4	4	4	4	4	4	4	4	4	4	1.00
Q4f	4	4	4	4	4	4	4	4	4	4	1.00
Q4g	4	4	4	4	4	4	4	4	4	4	1.00
Q4h	4	4	4	4	4	4	3	3	4	3	1.00
Q4i	4	4	4	4	4	4	4	4	4	4	1.00
Q5a	4	4	4	4	4	4	4	4	4	4	1.00
Q5b	4	3	3	4	4	4	4	4	4	4	1.00
Q5c	4	4	4	4	4	4	4	4	4	4	1.00
Q5d	4	4	4	4	4	4	4	4	4	4	1.00
Q5e	4	4	4	4	4	4	4	4	4	4	1.00
Q5f	4	4	4	4	4	4	4	4	4	4	1.00
Q5g	4	4	4	4	4	4	4	4	4	4	1.00
Q5h	4	4	4	4	4	4	4	4	4	4	1.00
Q5i	4	4	4	4	4	4	4	4	4	4	1.00
Q5j	4	4	4	4	4	4	4	4	4	4	1.00
Q5k	4	4	4	4	4	4	4	4	4	4	1.00
Q5l	4	4	4	4	4	4	4	4	4	4	1.00
Q5m	4	4	4	4	4	4	4	4	4	4	1.00
Q6a	4	4	4	4	4	4	4	4	4	4	1.00
Q6b	4	4	4	4	4	4	4	4	4	4	1.00
Q6c	4	4	4	4	4	4	4	4	4	4	1.00
Q6d	4	4	4	4	4	4	4	4	4	4	1.00
Q6e	3	3	4	4	4	3	3	3	3	4	1.00
Q6f	4	4	4	4	4	4	4	4	4	4	1.00
Q6g	4	4	4	4	4	4	4	4	4	4	1.00
Q6h	4	4	4	4	4	4	4	4	4	4	1.00
Q6i	4	4	4	4	4	4	4	4	4	4	1.00
Q6j	4	4	4	4	4	4	4	4	4	4	1.00
Q6k	4	4	4	4	4	4	4	4	4	4	1.00
Q6l	4	4	4	4	4	4	4	4	4	4	1.00
Q6m	4	4	4	4	4	4	4	4	4	4	1.00
Q6n	4	4	4	4	4	4	4	4	4	4	1.00
Q6o	4	4	4	4	4	4	4	4	4	4	1.00
Q6p	4	4	4	4	4	4	4	4	4	4	1.00
Q6q	4	4	4	4	4	4	4	4	4	4	1.00
Q6r	4	4	4	4	4	4	4	4	4	4	1.00
Q6s	4	4	4	4	4	4	4	4	4	4	1.00
Q6t	4	4	4	4	4	4	4	4	4	4	1.00
Q6u	4	4	4	4	4	4	4	4	4	4	1.00
Q6v	4	4	4	4	4	4	4	4	4	4	1.00
Q6w	4	4	4	4	4	4	4	4	4	4	1.00
Q7a	3	4	3	4	4	3	3	4	4	3	1.00
Q7a	4	4	4	4	4	4	4	4	4	4	1.00
Q7b	4	4	4	4	4	4	4	4	4	4	1.00
Q7c	4	4	4	4	4	4	4	4	4	4	1.00
Q7d	4	4	4	4	4	4	4	4	4	4	1.00
Q7e	4	4	4	4	4	4	4	4	4	4	1.00
Q7f	4	4	4	4	4	4	4	4	4	4	1.00

Q7g	4	4	4	4	4	4	4	4	4	4	1.00
Q7h	4	4	4	4	4	4	3	3	4	3	1.00
Q7i	4	4	4	4	4	4	4	4	4	4	1.00
Q8a	4	4	4	4	4	4	4	4	4	4	1.00
Q8b	4	4	4	4	4	4	4	4	4	4	1.00
Q8c	4	4	4	4	4	4	4	4	4	4	1.00
Q8d	4	4	4	4	4	4	4	4	4	4	1.00
Q8e	4	4	4	4	4	4	4	4	4	4	1.00
Q9a	4	4	4	4	4	4	4	4	4	4	1.00
Q9b	4	4	4	4	4	4	4	4	4	4	1.00
Q9c	4	4	4	4	4	4	4	4	4	4	1.00
Q9d	4	4	4	4	4	4	4	4	4	4	1.00
Q9e	3	3	4	4	4	3	3	3	3	4	1.00
Q9f	4	4	4	4	4	4	4	4	4	4	1.00
Q9g	4	4	4	4	4	4	4	4	4	4	1.00
Q9h	4	4	4	4	4	4	4	4	4	4	1.00
Q9i	4	4	4	4	4	4	4	4	4	4	1.00
Q9j	4	4	4	4	4	4	4	4	4	4	1.00
Q9k	4	4	4	4	4	4	4	4	4	4	1.00
Q9l	4	4	4	4	4	4	4	4	4	4	1.00
Q9m	4	4	4	4	4	4	4	4	4	4	1.00
Q9n	4	4	4	4	4	4	4	4	4	4	1.00
Q9o	4	4	4	4	4	4	4	4	4	4	1.00
Q9p	4	4	4	4	4	4	4	4	4	4	1.00
Q9q	4	4	4	4	4	4	4	4	4	4	1.00
Q9r	4	4	4	4	4	4	4	4	4	4	1.00
Q9s	4	4	4	4	4	4	4	4	4	4	1.00
Q9t	4	4	4	4	4	4	4	4	4	4	1.00
Q9u	4	4	4	4	4	4	4	4	4	4	1.00
Q9v	4	4	4	4	4	4	4	4	4	4	1.00
Q9w	4	4	4	4	4	4	4	4	4	4	1.00
Q10a	3	4	3	4	4	3	3	4	4	3	1.00
Q10b	4	4	4	4	4	4	4	4	4	4	1.00
Q10c	4	4	4	4	4	4	4	4	4	4	1.00
Q10d	4	4	4	4	4	4	4	4	4	4	1.00
Q10e	4	4	4	4	4	4	4	4	4	4	1.00
Q10f	4	4	4	4	4	4	4	4	4	4	1.00
Q10g	4	4	4	4	4	4	4	4	4	4	1.00
Q10h	4	4	4	4	4	4	3	3	4	3	1.00
Q10i	4	4	4	4	4	4	4	4	4	4	1.00
Q11a	4	4	4	4	4	4	4	4	4	4	1.00
Q11b	4	4	4	4	4	4	4	4	4	4	1.00
Q11c	4	4	4	4	4	4	4	4	4	4	1.00
Q11d	4	4	4	4	4	4	4	4	4	4	1.00
Q11e	4	4	4	4	4	4	4	4	4	4	1.00
Q12	4	4	4	4	4	4	4	4	4	4	1.00
Q13	4	4	4	4	4	4	4	4	4	4	1.00
Q14	4	4	4	4	4	4	4	4	4	4	1.00
Q15	4	4	4	4	4	4	4	4	4	4	1.00

Appendix 10: Online Survey Email Invitation

Online Survey for PhD Thesis - Windows Internet Explorer

https://db3prd0104.outlook.com/owa/?ae=Item&a=New&t=IPM.Note&cc=MTQuMTUuNDguMCxlbi1HQiw0MjklOOTY3Mjk1LEhUTUwsMCwx&pspid=_1336837577843_313379633

Send | Options... HTML

From: RICHMOND DAVIES (0614573)

To...

Cc...

Subject: Online Survey for PhD Thesis

Arial | 18 | B | I | U

Dear

You will recall you agreed to disseminate the details of my online questionnaire to members of your team in order to help me with collecting data on information activities of information workers.

Well, just to recap, I am a PhD student at Robert Gordon University engaged in a research study about the information behaviour of an information provider. You are aware that I completed the interviews with team leads or their representatives sometime ago and I am now at the next stage of the study which involves a survey questionnaire of all information workers in the group.

When you click on the link of the questionnaire, there are instructions that reveal details of how the questionnaire is structured, the voluntary participation of information workers, the respect for confidentiality and my assurance that, when reporting the findings, I will apply disclosure control to ensure that responses remain anonymous. Some of the questions are repetitive and the reason is that I want to capture feelings and perceptions of impact of information activities for each group of information activities.

It takes only 15 minutes out of your valuable time to complete the online questionnaire and anyone completing it will find it beneficial in helping them to reflect on their practice. **The URL is http://behaviour.limequery.org/99818**

Many thanks for your help.

Richmond Davies

PhD Student, Robert Gordon University
r.davies@rgu.ac.uk

Internet | 100%

start | Richmond | AAAAAFiles | Richmond Davi... | Email for online... | RICHMOND DA... | Online Survey ... | EN | 16:57

Appendix 11: An Email Confirming Cascade of Online Survey

From: ▮▮▮▮▮▮▮▮▮▮▮▮▮
Sent: 15 July 2010 11:33
To: Davies, Richmond
Subject: Survey update

Hi Richmond,

Everyone has been forwarded your email with the questionnaire URL and I understand from all those in today that they have completed it.

▮▮▮▮▮▮▮▮

Appendix 12: Emergence of Sub-themes for Positive Feelings

Sub-theme	Significant statement
Satisfied	"It's **satisfying** when you get it, it's frustrating when you don't" (FE25_T) "And that's quite **satisfying**, I think, actually finding out the information is like a quiz, if you get the right answer it's very, very satisfying" (FE25_T). "it's quite **satisfying** to know that something you've done has been checked, it's gone through some processes for checking and it's out there and people can read it and can use it" (FE25_T). "Well, it gave me a feeling of **satisfaction** to think 'Oh yes, that is it. If I go and do this, this, and this, then I'll have what I need" (KJ21_T). "Once we were finished, and once I'd got the finished document ready to go, it was very **satisfying**" (AL30_T).
Togetherness (solidarity, camaraderie), Satisfied	"I think we can feel a warm glow of **satisfaction** and a **feeling of camaraderie**, of a shared experience. I think these are sort of common experiences when you do something together, when you all pull together to a common goal" (HT23_T). "Because we worked closely together as a team and overcame such difficulties, there was that feeling of **being together** as an even more close-knit team" (AL30_T). "The newsletter brings everything together and we feel like a **well-bonded team** for producing such a highly-regarded product" (BQ29_T).. "I think those of us who were involved in receiving and answering the customers' difficult queries felt a certain amount of **cohesion** in adversity, as it were" (HT23_T).
Proud	"It gives you a bit of **pride** because, you know, you've created an

	output which is to help your customer" (FE25_T)
	"It's about making that available to anybody after the hard work and feeling **proud** about that" (AL30_T).
	We are **proud** of our newsletter and it instils a **good** feeling in us
Good	"The **good** feelings are that you're getting through the records quickly because you've got time constraints in getting the job done" (CK28_T).
	"It felt **good** to see the outcome of what you collect and what you process" (DN27_T).
	"If you're successful, you do feel... it does make you feel **good**" (EK26_T).
Confident	"It made me feel **confident** that if I was to go back and ask for information again or more information I could get that information and I knew exactly where to go" (DN27_T).
	"They do gain feelings of **confidence** from something that's been published" (GO24_T).
	"It builds their **confidence**, I think. You know, knowing that the mysteries of whatever you're trying to do, it's not a mystery. You can do what seemed to be complicated things" (FE25_T).
Sense of accomplishment	"I think generally there's a **feeling of achievement** when individuals are able to solve the particular request themselves" (CK28_T).
	"It makes you **feel like you are achieving**, hopefully achieving the initial outcome, and that you will have a successful conclusion at the end of the audit, and you'll be able to feedback something positive or negative to the customer" (EK26_T)
	"On the whole I guess a **sense of accomplishment** and I think for [redacted] specifically because they have worked on it more closely" (GO24_T).
	"There was also a **sense of achievement** in having, kind of got to

	know people out in the boards better and the people that I would be dealing with on a month to month basis. So I think I found it very useful and a very worthwhile exercise" (JC22_T). "I personally get a lot out of finding that the information that's coming in is already correct and I'm not marking things in error. I **feel like I've accomplished** something" (CK28_T).
Determined	"But then it's that challenge thing and you think, "Well, if I haven't found it I need to think of something else"; and then it's having that thought, you think, "Right, if I can't find it in this way can I add in something, I'll come at it from another direction. That was how **determined we felt**" (FE25_T). "You keep on thinking one more, one more search or one more, let's try this database, one more and you know and its almost you know **you get hooked on just trying to find that one more hit**. That was how we felt" (GO24_T). "**Frustrated** because it was difficult to filter the information but I knew there's a lot of good information in there. But nevertheless **determined** to keep on going" (AL30_T).
Encouraged, Happy	"Posting all that information online is… It's **encouraging**. It feels that… I suppose, from my point of view, the whole point of my role is to provide the tools, and the equipment, and the information so that people can access it themselves without having to come to a national person and ask for this or that information" (AL30_T). "I sort of felt **encouraged** especially as I always successfully found what I was looking for" (KJ21_T). "It's also about me feeling **happy** as a result of being successful at what we are looking for and feeling **encouraged** as well" (AL30_T).
Happy	"I was quite **happy** with the way we worked collaboratively to obtain shared ownership" (BQ29_T). "I think that in a sense has brought along a certain amount of **happiness** knowing that we have made the information available in such a way that the customers can generate useful bespoke reports themselves" (JC22_T).

Reassured, Happy	"I felt **reassured** about the security of the information we had secured electronically" (BQ29_T). "And having done it, I feel **happy** and **reassured** that the process has been used many times before" (AL30_T).
Relieved	"**Relief. Relief**. It's great. When a request comes in for something like that, and you're able to go away and source the information that people are looking for, and easily use it and provide it back, or easily link somebody to it, it's **pleasing**; but it's partly **relief** because it's an easy process". (AL30_T). "But I was **relieved** that we got there at the end - to bring all those pieces of information together" (BQ29_T).
Pleased, Reassured, Relieved	"I'm **pleased** that keeping everyone in the loop, as it were, ensured that we delivered on time" (BQ29_T). "I was very **pleased** with the fact that our efforts in convincing them that their data will be secure and then dealing with the huge mountain of data actually paid off" (BQ29_T). "I was actually feeling very **pleased** and **reassured** that some organisation as big as [redacted] had a, did have a good set of information that they could supply on a routine basis. That was a feeling of **relief**" (DN27_T).
Rewarded	"The fact that we were able to make it easily available to all is a **rewarding** feeling" (AL30_T). "It was very **rewarding** because of me having being involved right at the onset before the data was collected, been involved in the data collection, disseminating, presenting the information and then finally participating in its production as a formal report and I think it's good to see the whole process because it's not just about one side of it (DN27_T).
Excited	"The brainstorming and that kind of initial mind map phase - that's quite an **exciting** feeling because you are hearing everyone else's kind of take on that and then trying to figure out the way forward" (GO24_T). "It's quite **exciting** while searching" (FE25_T).

| | "I was **excited** about this approach because that's how I've always worked in my previous jobs - and I've got results" (BQ29_T). |

Appendix 13: Emergence of Sub-themes for Negative Feelings

Sub-theme	Significant statement
Frustrated	"It was very **frustrating**. I felt like banging my head against a brick wall at times" (AL30_T). "**Frustrated** because it was difficult to filter the information but I knew there's a lot of good information in there" (AL30_T). "There were some **frustrations** in getting that information" (BQ29_T). "When we fail to get our figures published on time, it feels just **frustrating** because it's beyond our control as the problem lies with IT" (CK28_T). "So that was really quite **frustrating**. It took something like ten or eleven months to get the report produced and actually released, which is a lot longer than normal" (KJ21_T). "I think it is a bit **frustrating** sometimes because you have an idea in your head of what you're looking for but can't find it when trawling, and I don't know if trawling through the internet is the best option sometimes" (GO24_T).
Disappointed	"Everybody hadn't realised that the nature of the collection was much larger than they'd anticipated. It took a lot longer time than we anticipated and so, having collected all this information, we didn't have enough time to properly analyse the information. We didn't do enough interpretation of the data. We had to just give them very high level numbers rather than spend more time looking at the data, maybe pulling in other data sources to see how it compared with that. I and others were very **disappointed**" (DN27_T). "**Disappointed** that we weren't able to prove or disprove the information we were searching for was good, and **disappointed** that we would have to look for alternative methods of being able to audit the information as well" (EK26_T).

	"It's a bit **disheartening or disappointing** when you then spend two days and you don't find the information you've been trying to look for" (GO24_T). "But obviously the feeling is that of **disappointment** but at the same time the disappointment is due to the constraints within the information system that you're trying to work, not the constraints of the individual" (CK28_T).
Hopeless	"You do wonder if you are doing something wrong when you're actually trying to search and without success, it might be that you. . .,I probably waste... I dunno if I can say wasted time but I felt that I was wasting time. Felt **hopeless**" (GO24_T). "The effect, you know, was quite negative because there was a lot of work that had been put into that. A lot of work with clinicians, as well, you know, working with health board managers, working with clinical staff, working with steering groups, you know, IT managers, really in the hope that the information that was there could be used. We felt **hopeless**" (EK26_T).
Tired	"How did I feel? I would say [pause] no, not frustrated but very **tired**" (KJ21_T). "Obviously, if you're finding a lot of errors then, okay, you're doing what's expected of you in terms of your job but you naturally feel a wee bit deflated, or rather **tired**, as you're finding all these errors" (CK28_T). "It's very **tiring** quality checking such masses of information. It's quite draining" (CK28_T).
Annoyed	"It made me feel, I was **annoyed**" (DN27_T). - in response to the perception that the output was of low quality due to time constraints "I felt so **annoyed** that I was unable to shorten the time for producing the report; basically because there were many factors out with our control" (KJ21_T)
Confused, Frustrated	"Others had a variety of different errors which made us feel even more **confused** while trying to make sense of them" (KJ21_T).

	"So how did that make me feel [pause] **confused**" (BQ29_T) – in response to trying to figure out the information requirements of a customer. "I felt very **frustrated and confused**. I felt that there was a real danger that the project was going to fail" (HT23_T). – in response to the scheme for capturing data not working according to plan because instructions were to cascaded to the appropriate people supplying the data.
Uncomfortable	"I suppose I had that feeling of **discomfort** as a result of always having to check my work against information from the other home countries" (AL30_T). "I couldn't find any sort of basic information on how many people in Scotland have that particular condition and I felt **uncomfortable** using the incomplete data we already had because there were too many caveats" (DN27_T). "I felt **uncomfortable** about the way we were disseminating the information and had to suggest that the plan was revisited" (HT23_T).
Overwhelmed	"Trawling through the internet can feel onerous, **overwhelming**" (GO24_T). "I would then feel **overwhelmed** with the sheer amount of info we would have to sift through" (KJ21_T).

Appendix 14: Extracts of Chi-Square and Fisher's Exact Tests for Gender

Gender * In-depth reading when acquiring info

Crosstab

			Never/ Hardly ever	Some/ Most of the time	Total
Gender	Female	Count	9	33	42
		Expected Count	15.0	27.0	42.0
		% within Gender	21.4%	78.6%	100.0%
		% within In-depth reading when acquiring info	36.0%	73.3%	60.0%
		% of Total	12.9%	47.1%	60.0%
		Std. Residual	-1.5	1.2	
	Male	Count	16	12	28
		Expected Count	10.0	18.0	28.0
		% within Gender	57.1%	42.9%	100.0%
		% within In-depth reading when acquiring info	64.0%	26.7%	40.0%
		% of Total	22.9%	17.1%	40.0%
		Std. Residual	1.9	-1.4	
Total		Count	25	45	70
		Expected Count	25.0	45.0	70.0
		% within Gender	35.7%	64.3%	100.0%
		% within In-depth reading when acquiring info	100.0%	100.0%	100.0%
		% of Total	35.7%	64.3%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	9.333[a]	1	.002	.005	.003	
Continuity Correction[b]	7.843	1	.005			
Likelihood Ratio	9.358	1	.002	.005	.003	
Fisher's Exact Test				.005	.003	
Linear-by-Linear Association	9.200[c]	1	.002	.005	.003	.002
N of Valid Cases	70					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.00.

b. Computed only for a 2x2 table

c. The standardized statistic is -3.033.

Symmetric Measures

		Value	Approx. Sig.	Exact Sig.
Nominal by Nominal	Phi	-.365	.002	.005
	Cramer's V	.365	.002	.005
	Contingency Coefficient	.343	.002	.005
N of Valid Cases		70		

Gender * Securing data/info when producing info

Crosstab

| | | | Securing data/info when producing info | | |
			Hardly ever	Most of the time	Total
Gender	Female	Count	2	40	42
		Expected Count	5.4	36.6	42.0
		% within Gender	4.8%	95.2%	100.0%
		% within Securing data/info when producing info	22.2%	65.6%	60.0%
		% of Total	2.9%	57.1%	60.0%
		Std. Residual	-1.5	.6	
	Male	Count	7	21	28
		Expected Count	3.6	24.4	28.0
		% within Gender	25.0%	75.0%	100.0%
		% within Securing data/info when producing info	77.8%	34.4%	40.0%
		% of Total	10.0%	30.0%	40.0%
		Std. Residual	1.8	-.7	
Total		Count	9	61	70
		Expected Count	9.0	61.0	70.0
		% within Gender	12.9%	87.1%	100.0%
		% within Securing data/info when producing info	100.0%	100.0%	100.0%
		% of Total	12.9%	87.1%	100.0%

Chi-Square Tests

	Value	df	Sig. (2-sided)	Exact Sig. (2-sided)	Sig. (1-sided)	Point Probability
Pearson Chi-Square	6.141[a]	1	.013	.025	.018	
Continuity Correction[b]	4.468	1	.035			
Likelihood Ratio	6.141	1	.013	.025	.018	
Fisher's Exact Test				.025	.018	
Linear-by-Linear Association	6.054[c]	1	.014	.025	.018	.016
N of Valid Cases	70					

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is

b. Computed only for a 2x2 table

c. The standardized statistic is -2.460.

Symmetric Measures

		Value	Approx. Sig.	Exact Sig.
Nominal by Nominal	Phi	-.296	.013	.025
	Cramer's V	.296	.013	.025
	Contingency Coefficient	.284	.013	.025
N of Valid Cases		70		

Gender * Collaborating with specialists or experts

Crosstab

| | | | Collaborating with specialists or experts | | |
			Hardly ever	Most of the time	Total
Gender	Female	Count	6	36	42
		Expected Count	10.2	31.8	42.0
		% within Gender	14.3%	85.7%	100.0%
		% within Collaborating with specialists or experts	35.3%	67.9%	60.0%
		% of Total	8.6%	51.4%	60.0%
		Std. Residual	-1.3	.7	
	Male	Count	11	17	28
		Expected Count	6.8	21.2	28.0
		% within Gender	39.3%	60.7%	100.0%
		% within Collaborating with specialists or experts	64.7%	32.1%	40.0%
		% of Total	15.7%	24.3%	40.0%
		Std. Residual	1.6	-.9	
Total		Count	17	53	70
		Expected Count	17.0	53.0	70.0
		% within Gender	24.3%	75.7%	100.0%
		% within Collaborating with specialists or experts	100.0%	100.0%	100.0%
		% of Total	24.3%	75.7%	100.0%

Chi-Square Tests

	Value	df	Sig. (2-sided)	Exact Sig. (2-sided)	Sig. (1-sided)	Point Probability
Pearson Chi-Square	5.710[a]	1	.017	.024	.018	
Continuity Correction[b]	4.432	1	.035			
Likelihood Ratio	5.639	1	.018	.024	.018	
Fisher's Exact Test				.024	.018	
Linear-by-Linear Association	5.629[c]	1	.018	.024	.018	.014
N of Valid Cases	70					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.80.

b. Computed only for a 2x2 table

c. The standardized statistic is -2.372.

Symmetric Measures

		Value	Approx. Sig.	Exact Sig.
Nominal by Nominal	Phi	-.286	.017	.024
	Cramer's V	.286	.017	.024
	Contingency Coefficient	.275	.017	.024
N of Valid Cases		70		

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Appendix 15: Summary of Findings of Tests of Associations

Associations between gender and information behaviour (2x2 contingency tables)	Chi-square	Fisher's Exact	p-value (2-sided)
Gender * Browsing internet while acquiring info	^		0.705
Gender * Searching while acquiring info	0.000		1.000
Gender * Delegating when acquiring info	^		0.506
Gender * Capturing when acquiring info	1.037		0.445
Gender * Clarifying when acquiring info	^^		^^
Gender * Consulting when acquiring info	^		0.400
Gender * Emailing when acquiring info	^		1.000
Gender * Encountering when acquiring info	2.188		0.139
Gender * Figuring out when acquiring info	^		0.560
Gender * Telephoning when acquiring info	0.729		0.393
Gender * In-depth reading when acquiring info	9.333		0.002
Gender * Skim reading when acquiring info	0.466		0.495
Gender * Retrieving data when acquiring info	^		0.751
Gender * Scanning the environment when acquiring info	2.456		0.117
Gender * Analysing data when producing info	0.292		0.589
Gender * Checking when producing info	^^		^^
Gender * Comparing when producing info	^		0.149
Gender * Formatting when producing info	^		0.426
Gender * Integrating when producing info	^		1.000
Gender * Separating when producing info	^		0.107
Gender * Refining when producing info	^		0.468
Gender * Interpreting when producing info	^		1.000
Gender * Manipulating data when producing info	0.518		0.472
Gender * Writing/preparing reports when producing info	^		0.506
Gender * Securing data/info when producing info	^		0.025
Gender * Storing data/info when producing info	^		0.183
Gender * Transforming when producing info	1.373		0.241
Gender * Cascading when disseminating info	0.864		0.353
Gender * Publishing online when disseminating info	0.012		0.911
Gender * Presenting formally when disseminating	0.038		0.845
Gender * Presenting informally when disseminating	^		1.000
Gender * Transmitting when disseminating	^		1.000
Gender * Multitasking (concurrent)	0.000		1.000
Gender * Multitasking (sequential)	^		1.000
Gender * Collaborating with peers	^		0.513
Gender * Collaborating with specialists or experts	5.710		0.017
Gender * Collaborating as part of work process	^		0.294

NOTES

^ Assumptions of Chi-square test violated. Therefore Fisher's Exact test p-value show n.

  (Fisher's Exact test value not computed for 2x2 table)

^^ No statistics computed because of zero values in one of the columns in the contingency table.

Associations between age group and information behaviour (7x2 contingency tables)	Chi-square	Fisher's Exact	p-value (2-sided)
Age group * Browsing internet while acquiring info	^	4.491	0.579
Age group * Using search terms while acquiring info	^	12.246	0.029
Age group * Delegating when acquiring info	^	8.165	0.140
Age group * Capturing when acquiring info	^	8.065	0.211
Age group * Clarifying when acquiring info	^^		^^
Age group * Consulting when acquiring info	^	8.462	0.200
Age group * Emailing when acquiring info	^	4.978	0.725
Age group * Encountering when acquiring info	^	10.819	0.076
Age group * Figuring out when acquiring info	^	4.734	0.642
Age group * Telephoning when acquiring info	^	9.856	0.083
Age group * In-depth reading when acquiring info	^	13.210	0.026
Age group * Skim reading when acquiring info	^	15.090	0.008
Age group * Retrieving data when acquiring info	^	6.197	0.342
Age group * Scanning the environment when acquiring info	^	9.212	0.145
Age group * Analysing data when producing info	^	10.030	0.093
Age group * Checking when producing info	^^		^^
Age group * Comparing when producing info	^	4.151	0.678
Age group * Formatting when producing info	^	2.321	0.933
Age group * Integrating when producing info	^	8.834	0.094
Age group * Separating when producing info	^	5.579	0.378
Age group * Refining when producing info	^	5.076	0.484
Age group * Interpreting when producing info	^	4.389	0.601
Age group * Manipulating data when producing info	^	2.637	0.902
Age group * Writing/preparing reports when producing info	^	9.978	0.059
Age group * Securing data/info when producing info	^	7.223	0.209
Age group * Storing data/info when producing info	^	7.045	0.231
Age group * Transforming when producing info	^	1.999	0.961
Age group * Cascading when disseminating info	^	6.484	0.333
Age group * Publishing online when disseminating info	^	4.195	0.665
Age group * Presenting formally when disseminating	^	22.973	0.000
Age group * Presenting informally when disseminating	^	11.506	0.030
Age group * Transmitting when disseminating	^	6.985	0.227
Age group * Multitasking (concurrent) activities	^	9.915	0.084
Age group * Multitasking (sequential) activities	^	5.913	0.336
Age group * Collaborating with peers	^	6.985	0.227
Age group * Collaborating with specialists or experts	^	16.657	0.004
Age group * Collaborating as part of work process	^	6.538	0.221

NOTES

^ Assumptions of Chi-square test violated. Therefore Fisher's Exact test p-value shown.

^^ No statistics computed because of zero values in one of the columns in the contingency table.

Associations between age group and information behaviour (7x2 contingency tables)	Chi-square	Fisher's Exact	p-value (2-sided)
Age group * Browsing internet while acquiring info	^	4.491	0.579
Age group * Using search terms while acquiring info	^	12.246	0.029
Age group * Delegating when acquiring info	^	8.165	0.140
Age group * Capturing when acquiring info	^	8.065	0.211
Age group * Clarifying when acquiring info	^^		^^
Age group * Consulting when acquiring info	^	8.462	0.200
Age group * Emailing when acquiring info	^	4.978	0.725
Age group * Encountering when acquiring info	^	10.819	0.076
Age group * Figuring out when acquiring info	^	4.734	0.642
Age group * Telephoning when acquiring info	^	9.856	0.083
Age group * In-depth reading when acquiring info	^	13.210	0.026
Age group * Skim reading when acquiring info	^	15.090	0.008
Age group * Retrieving data when acquiring info	^	6.197	0.342
Age group * Scanning the environment when acquiring info	^	9.212	0.145
Age group * Analysing data when producing info	^	10.030	0.093
Age group * Checking when producing info	^^		^^
Age group * Comparing when producing info	^	4.151	0.678
Age group * Formatting when producing info	^	2.321	0.933
Age group * Integrating when producing info	^	8.834	0.094
Age group * Separating when producing info	^	5.579	0.378
Age group * Refining when producing info	^	5.076	0.484
Age group * Interpreting when producing info	^	4.389	0.601
Age group * Manipulating data when producing info	^	2.637	0.902
Age group * Writing/preparing reports when producing info	^	9.978	0.059
Age group * Securing data/info when producing info	^	7.223	0.209
Age group * Storing data/info when producing info	^	7.045	0.231
Age group * Transforming when producing info	^	1.999	0.961
Age group * Cascading when disseminating info	^	6.484	0.333
Age group * Publishing online when disseminating info	^	4.195	0.665
Age group * Presenting formally when disseminating	^	22.973	0.000
Age group * Presenting informally when disseminating	^	11.506	0.030
Age group * Transmitting when disseminating	^	6.985	0.227
Age group * Multitasking (concurrent) activities	^	9.915	0.084
Age group * Multitasking (sequential) activities	^	5.913	0.336
Age group * Collaborating with peers	^	6.985	0.227
Age group * Collaborating with specialists or experts	^	16.657	0.004
Age group * Collaborating as part of work process	^	6.538	0.221

NOTES

^ Assumptions of Chi-square test violated. Therefore Fisher's Exact test p-value shown.

^^ No statistics computed because of zero values in one of the columns in the contingency table.

Associations between work experience (years of service) and information behaviour (10x2 contingency tables)	Chi-square	Fisher's Exact	p-value (2-sided)
Years of service * Browsing internet while acquiring info	^	6.474	0.660
Years of service * Searching while acquiring info	^	8.581	0.424
Years of service * Delegating when acquiring info	^	10.641	0.141
Years of service * Capturing when acquiring info	^	8.689	0.474
Years of service * Clarifying when acquiring info	^^		^^
Years of service * Consulting when acquiring info	^	12.150	0.543
Years of service * Emailing when acquiring info	^	9.542	0.321
Years of service * Encountering when acquiring info	^	3.852	0.953
Years of service * Figuring out when acquiring info	^	7.502	0.612
Years of service * Telephoning when acquiring info	^	13.845	0.049
Years of service * In-depth reading when acquiring info	^	8.324	0.517
Years of service * Skim reading when acquiring info	^	6.578	0.707
Years of service * Retrieving data when acquiring info	^	3.547	0.987
Years of service * Scanning the environment when acquiring info	^	15.291	0.066
Years of service * Analysing data when producing info	^	9.723	0.340
Years of service * Checking when producing info	^^		^^
Years of service * Comparing when producing info	^	5.632	0.868
Years of service * Formatting when producing info	^	5.063	0.915
Years of service * Integrating when producing info	^	10.793	0.112
Years of service * Separating when producing info	^	8.361	0.305
Years of service * Refining when producing info	^	8.882	0.286
Years of service * Interpreting when producing info	^	6.109	0.739
Years of service * Manipulating data when producing info	^	12.844	0.136
Years of service * Writing/preparing reports when producing info	^	8.845	0.311
Years of service * Securing data/info when producing info	^	6.048	0.743
Years of service * Storing data/info when producing info	^	4.706	0.927
Years of service * Transforming when producing info	^	10.949	0.277
Years of service * Cascading when disseminating info	^	9.577	0.321
Years of service * Publishing online when disseminating info	^	17.220	0.016
Years of service * Presenting formally when disseminating	^	13.137	0.142
Years of service * Presenting informally when disseminating	^	4.939	0.905
Years of service * Transmitting when disseminating	^	9.542	0.321
Years of service * Multitasking (concurrent) activities	^	13.823	0.055
Years of service * Multitasking (sequential) activities	^	8.392	0.300
Years of service * Collaborating with peers	^	12.103	0.011
Years of service * Collaborating with specialists or experts	^	11.820	0.150
Years of service * Collaborating as part of work process	^	7.626	0.429

NOTES

^ Assumptions of Chi-square test violated. Therefore Fisher's Exact test p-value shown.

^^ No statistics computed because of zero values in one of the columns in the contingency table.

Appendix 16: Reliability Analysis Output

Case Processing Summary

		N	%
Cases	Valid	70	100.0
	Excluded[a]	0	.0
	Total	70	100.0

a. Listwise deletion based on all variables in the procedure.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Patients as customers	29.61	22.907	.296	.292	.747
Healthcare providers as customers	27.20	22.278	.366	.379	.740
Local authorities as customers	28.64	21.392	.320	.445	.747
Scottish Govt as customers	27.53	23.586	.160	.479	.758
Private organisations as customers	28.86	20.704	.482	.416	.726
Researchers/Universities as customers	28.49	23.152	.177	.409	.758
Voluntary organisations as customers	29.07	19.777	.662	.537	.706
Professional bodies as customers	28.69	20.190	.574	.498	.716
IT/Systems developers as customers	28.84	23.352	.061	.344	.782
The media as customers	28.77	18.527	.688	.645	.696
General public as customers	28.94	21.098	.436	.521	.732
Other national organisations as customers	28.86	20.385	.647	.525	.711
Colleagues as customers	27.64	23.885	.102	.346	.763

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.754	.752	13

Case Processing Summary

		N	%
Cases	Valid	70	100.0
	Excluded[a]	0	.0
	Total	70	100.0

a. Listwise deletion based on all variables in the procedure.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Browsing internet while acquiring info	39.00	19.333	.303	.621	.767
Searching while acquiring info	39.13	17.998	.436	.679	.755
Delegating when acquiring info	39.09	18.166	.467	.305	.752
Capturing when acquiring info	39.23	18.904	.170	.386	.794
Clarifying when acquiring info	38.64	18.755	.528	.676	.751
Consulting when acquiring info	38.76	18.737	.534	.647	.751
Emailing when acquiring info	38.47	19.499	.306	.391	.767
Encountering when acquiring info	39.61	18.501	.463	.499	.753
Figuring out when acquiring info	38.90	19.048	.478	.465	.755
Telephoning when acquiring info	39.17	19.014	.418	.474	.758
In-depth reading when acquiring info	39.43	17.698	.544	.452	.744
Skim reading when acquiring info	39.23	17.541	.608	.502	.739
Retrieving data when acquiring info	38.71	21.077	-.059	.464	.808
Scanning the environment when acquiring info	39.56	17.149	.633	.546	.735

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.773	.802	14

Scale: Q3 - Information acquisition behaviour - Positive feelings

Case Processing Summary

Cases		N	%
	Valid	70	100.0
	Excluded[a]	0	.0
	Total	70	100.0

a. Listwise deletion based on all variables in the procedure.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Feel encouraged following info acquisition	37.39	24.066	.664	.751	.873
Feel rewarded following info acquisition	37.47	24.340	.558	.560	.879
Feel reassured following info acquisition	37.34	24.287	.701	.758	.872
Feel happy following info acquisition	37.54	23.904	.671	.633	.873
Feeling of togetherness following info acquisition	37.69	24.335	.655	.549	.874
Feel excited following info acquisition	37.97	24.695	.559	.495	.879
Feel relieved following info acquisition	37.59	26.565	.358	.470	.887
Feel proud following info acquisition	37.79	24.808	.571	.545	.878
Feel pleased following info acquisition	37.40	26.186	.655	.595	.878
Feel determined following info acquisition	37.36	26.088	.377	.379	.887
Feel sense of accomplishment following info acquisition	37.34	25.098	.652	.544	.875
Feel confident following info acquisition	37.46	24.455	.615	.499	.876
Feel good following info acquisition	37.50	25.123	.677	.731	.874
Feel satisfied following info acquisition	37.37	27.744	.197	.268	.891

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.886	.887	14

Scale: Q3 - Information acquisition behaviour - Negative feelings

Case Processing Summary

Cases		N	%
	Valid	70	100.0
	Excluded[a]	0	.0
	Total	70	100.0

a. Listwise deletion based on all variables in the procedure.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Feel confused following info acquisition	19.47	19.209	.544	.485	.883
Feel uncomfortable following info acquisition	19.89	18.364	.703	.632	.872
Feel overwhelmed following info acquisition	19.73	19.099	.520	.376	.885
Feel hopeless following info acquisition	20.40	19.461	.550	.404	.882
Feel annoyed following info acquisition	19.80	18.568	.718	.546	.871
Feel tired following info acquisition	19.59	19.116	.641	.535	.876
Feel disappointed following info acquisition	19.80	19.699	.524	.570	.884
Feel frustrated following info acquisition	19.36	19.218	.581	.570	.880
Feel anxious following info acquisition	20.01	17.927	.760	.682	.867
Feel worried following info acquisition	19.96	18.071	.710	.627	.871

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.888	.888	10

Scale: Q4 - Information acquisition behaviour - Perceived positive impact

Case Processing Summary

		N	%
Cases	Valid	70	100.0
	Excluded[a]	0	.0
	Total	70	100.0

a. Listwise deletion based on all variables in the procedure.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Processes are improved following info acquisition	22.11	6.422	.480	.369	.742
Reputation is enhanced following info acquisition	22.19	5.893	.538	.382	.728
Lessons are learnt following info acquisition	22.10	6.120	.484	.268	.740
Policy makers are influenced following info acquisition	22.51	6.051	.411	.202	.758
Staff are motivated following info acquisition	22.56	6.076	.499	.310	.737
Good relationships are established following info	22.14	6.385	.505	.386	.738
Info sharing culture established following info acquisition	22.30	5.865	.522	.322	.732

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.768	.772	7

Scale: Q4 - Information acquisition behaviour - Perceived negative impact

Case Processing Summary

		N	%
Cases	Valid	70	100.0
	Excluded[a]	0	.0
	Total	70	100.0

a. Listwise deletion based on all variables in the procedure.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Others are blamed following info acquisition	2.56	.830	.535	.287	[a]
Others are deskilled following info acquisition	2.29	.787	.535	.287	[a]

a. Not applicable

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.697	.697	2

453

Scale: Q5 - Information production behaviour - Subtype

Case Processing Summary

		N	%
Cases	Valid	70	100.0
	Excluded[a]	0	.0
	Total	70	100.0

a. Listwise deletion based on all variables in the procedure.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Analysing data when producing info	37.20	16.684	.253	.292	.746
Checking when producing info	36.47	16.775	.418	.381	.729
Comparing when producing info	36.77	15.947	.511	.499	.718
Formatting when producing info	36.93	16.241	.477	.581	.722
Integrating when producing info	36.93	14.908	.666	.527	.698
Separating when producing info	36.87	15.592	.588	.482	.710
Refining when producing info	36.93	17.227	.220	.406	.747
Interpreting when producing info	37.06	17.504	.164	.347	.753
Manipulating data when producing info	37.24	15.433	.448	.450	.722
Writing/preparing reports when producing info	36.99	17.232	.201	.510	.750
Securing data/info when producing info	36.79	16.751	.246	.390	.747
Storing data/info when producing info	36.87	16.085	.376	.382	.731
Transforming when producing info	37.64	15.363	.366	.289	.735

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.747	.758	13

Scale: Q6 - Information production behaviour - Positive feelings

Case Processing Summary

		N	%
Cases	Valid	70	100.0
	Excluded[a]	0	.0
	Total	70	100.0

a. Listwise deletion based on all variables in the procedure.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Feel encouraged following info production	37.83	23.361	.733	.672	.899
Feel rewarded following info production	37.96	23.375	.624	.488	.903
Feel reassured following info production	37.87	23.128	.709	.609	.900
Feel happy following info production	38.04	22.360	.805	.755	.895
Feeling of togetherness following info production	38.14	23.168	.611	.574	.904
Feel excited following info production	38.34	22.518	.636	.500	.903
Feel relieved following info production	38.14	25.023	.343	.391	.913
Feel proud following info production	38.19	23.255	.575	.466	.905
Feel pleased following info production	37.94	23.620	.769	.665	.899
Feel determined following info production	37.90	24.845	.423	.410	.910
Feel sense of accomplishment following info production	37.83	24.492	.625	.535	.904
Feel confident following info production	37.86	24.443	.494	.438	.907
Feel good following info production	37.97	23.014	.715	.667	.899
Feel satisfied following info production	37.87	23.795	.651	.687	.902

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.909	.912	14

Scale: Q6 - Information production behaviour - Negative feelings

Case Processing Summary

		N	%
Cases	Valid	70	100.0
	Excluded[a]	0	.0
	Total	70	100.0

a. Listwise deletion based on all variables in the procedure.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Feel confused following info production	17.64	17.711	.567	.401	.894
Feel uncomfortable following info production	18.06	17.823	.581	.479	.892
Feel overwhelmed following info production	17.91	17.703	.556	.451	.895
Feel hopeless following info production	18.36	18.001	.642	.484	.889
Feel annoyed following info production	17.84	16.917	.627	.552	.890
Feel tired following info production	17.64	18.262	.592	.444	.892
Feel disappointed following info production	17.86	17.458	.720	.641	.884
Feel frustrated following info production	17.50	16.804	.697	.581	.885
Feel anxious following info production	18.06	16.837	.786	.759	.879
Feel worried following info production	18.10	17.367	.743	.684	.882

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.898	.901	10

Scale: Q7 - Information production behaviour - Perceived positive impact

Case Processing Summary

		N	%
Cases	Valid	70	100.0
	Excluded[a]	0	.0
	Total	70	100.0

a. Listwise deletion based on all variables in the procedure.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Processes are improved following info production	22.40	8.678	.594	.539	.850
Reputation is enhanced following info production	22.40	8.591	.711	.643	.838
Lessons are learnt following info production	22.41	8.014	.729	.674	.832
Policy makers are influenced following info production	22.93	8.125	.510	.416	.867
Staff are motivated following info production	22.77	8.324	.583	.546	.852
Good relationships are established following info	22.40	8.388	.655	.531	.842
Info sharing culture established following info production	22.57	7.437	.739	.687	.829

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.864	.871	7

455

Scale: Q7 - Information production behaviour - Perceived negative impact

Case Processing Summary

		N	%
Cases	Valid	70	100.0
	Excluded[a]	0	.0
	Total	70	100.0

a. Listwise deletion based on all variables in the procedure.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Others are blamed following info production	2.44	.830	.677	.459	[a]
Others are deskilled following info production	2.27	.954	.677	.459	[a]

a. Not applicable

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.806	.808	2

Scale: Q8 - Information dissemination behaviour - Subtype

Case Processing Summary

		N	%
Cases	Valid	70	100.0
	Excluded[a]	0	.0
	Total	70	100.0

a. Listwise deletion based on all variables in the procedure.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Cascading when disseminating info	11.70	4.619	.494	.305	.670
Publishing online when disseminating info	11.81	4.559	.337	.137	.750
Presenting formally when disseminating	12.13	4.114	.623	.536	.614
Presenting informally when disseminating	11.56	4.685	.615	.535	.634
Transmitting when disseminating	11.09	5.094	.413	.315	.700

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.722	.739	5

Scale: Q9 - Information dissemination behaviour - Positive feelings

Case Processing Summary

		N	%
Cases	Valid	70	100.0
	Excluded[a]	0	.0
	Total	70	100.0

a. Listwise deletion based on all variables in the procedure.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Feel encouraged following info dissemination	37.81	41.632	.861	.821	.941
Feel rewarded following info dissemination	37.91	42.949	.729	.724	.945
Feel reassured following info dissemination	37.84	42.453	.791	.793	.943
Feel happy following info dissemination	37.84	41.671	.860	.868	.942
Feeling of togetherness following info dissemination	38.01	42.797	.716	.618	.945
Feel excited following info dissemination	38.24	41.810	.752	.669	.945
Feel relieved following info dissemination	38.01	44.275	.560	.518	.949
Feel proud following info dissemination	38.00	43.159	.679	.628	.946
Feel pleased following info dissemination	37.74	43.498	.807	.879	.944
Feel determined following info dissemination	37.81	43.342	.567	.530	.950
Feel sense of accomplishment following info	37.61	43.197	.783	.802	.944
Feel confident following info dissemination	37.73	43.795	.674	.642	.946
Feel good following info dissemination	37.80	42.133	.783	.888	.944
Feel satisfied following info dissmination	37.64	43.334	.791	.809	.944

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.949	.950	14

Scale: Q9 - Information dissemination behaviour - Negative feelings

Case Processing Summary

		N	%
Cases	Valid	70	100.0
	Excluded[a]	0	.0
	Total	70	100.0

a. Listwise deletion based on all variables in the procedure.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Feel confused following info dissemination	16.54	28.368	.654	.533	.942
Feel uncomfortable following info dissemination	16.66	26.837	.829	.730	.933
Feel overwhelmed following info dissemination	16.73	28.230	.687	.579	.940
Feel hopeless following info dissemination	17.04	29.317	.765	.665	.938
Feel annoyed following info dissemination	16.66	27.562	.799	.775	.935
Feel tired following info dissemination	16.43	27.843	.784	.673	.936
Feel disappointed following info dissemination	16.74	28.426	.779	.692	.936
Feel frustrated following info dissemination	16.44	26.714	.833	.770	.933
Feel anxious following info dissemination	16.76	27.723	.744	.726	.938
Feel worried following info dissemination	16.89	28.190	.807	.772	.935

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.943	.944	10

Scale: Q10 - Information dissemination behaviour - Perceived positive impact

Case Processing Summary

		N	%
Cases	Valid	70	100.0
	Excluded[a]	0	.0
	Total	70	100.0

a. Listwise deletion based on all variables in the procedure.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Processes are improved following info dissemination	22.79	11.127	.709	.646	.882
Reputation is enhanced following info dissemination	22.77	10.643	.726	.614	.879
Lessons are learnt following info dissemination	22.80	10.829	.716	.689	.881
Policy makers are influenced following info dissemination	23.07	11.372	.522	.433	.904
Staff are motivated following info dissemination	22.96	10.708	.755	.731	.876
Good relationships are established following info	22.66	11.098	.740	.629	.879
Info sharing culture established following info dissemination	22.73	10.056	.771	.632	.874

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.898	.900	7

Scale: Q10 - Information dissemination behaviour - Perceived negative impact

Case Processing Summary

		N	%
Cases	Valid	70	100.0
	Excluded[a]	0	.0
	Total	70	100.0

a. Listwise deletion based on all variables in the procedure.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Others are blamed following info dissemination	2.39	.965	.775	.600	[a]
Others are deskilled following info dissemination	2.21	.808	.775	.600	[a]

a. Not applicable

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.871	.873	2

Scale: Q11 - Multitasking information behaviour

Case Processing Summary

		N	%
Cases	Valid	70	100.0
	Excluded[a]	0	.0
	Total	70	100.0

a. Listwise deletion based on all variables in the procedure.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Multitasking (concurrent) activities	3.47	.340	.609	.371	[a]
Multitasking (sequential) activities	2.96	.505	.609	.371	[a]

a. Not applicable

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.748	.757	2

Scale: Q11 - Collaborative information behaviour

Case Processing Summary

		N	%
Cases	Valid	70	100.0
	Excluded[a]	0	.0
	Total	70	100.0

a. Listwise deletion based on all variables in the procedure.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Collaborating with peers	6.03	1.014	.631	.408	.596
Collaborting with specialists or experts	6.57	.799	.624	.408	.612
Collaborating as part of work process	6.29	1.222	.494	.245	.746

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.745	.749	3

Appendix 17: Consent Form for Respondent Validation Workshop

Respondent Validation Workshop for PhD thesis

This is to confirm that:

- I attended a research validation session facilitated by Richmond Davies on 14th March 2012.
- I understand that the feedback from the session will contribute to the development of a PhD thesis whose aim, objectives and benefits have been explained to me.
- My participation is entirely voluntary and I can withdraw from the session at any time without any repercussions.
- I give permission for my comments to be used in the thesis as long as no comments are attributable to me and that I remain anonymous.

Signature of participant:

Signature of researcher:

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Information Behaviour of an Information Provider.

Research participants' workshop
14 March 2012

Richmond Davies
r.davies@rgu.ac.uk

Questions

- Do the themes and categories make sense?
- Do you believe they represent your experiences?
- Which categories or sub-categories would you remove?
- Which categories or sub-categories would you refine or add?
- Any comments on the survey results?
- What would a final model look like?
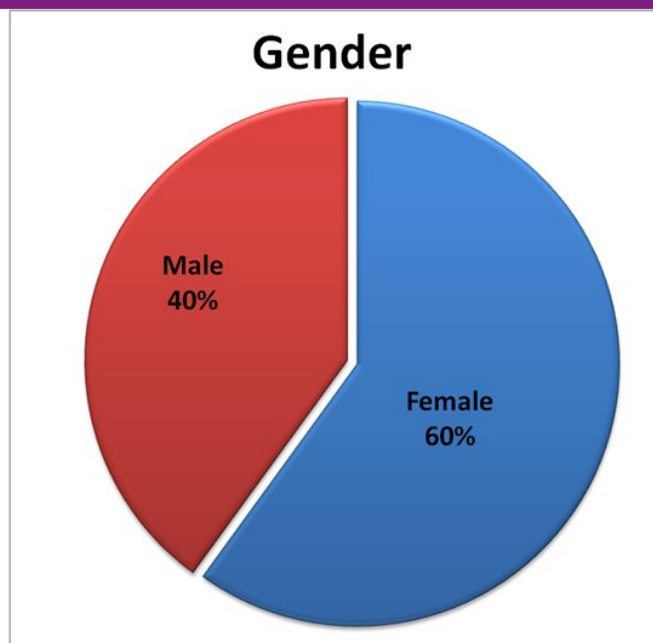- Do you have any general comments?
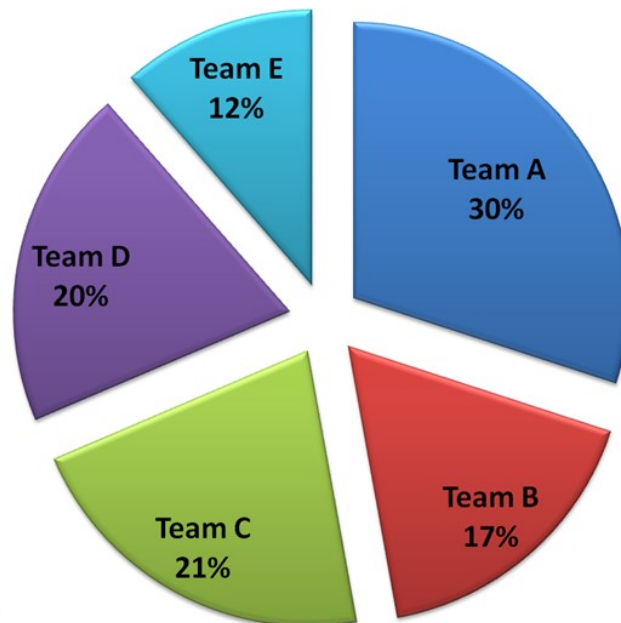
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One-to-One Interviews

- Waiting Times Programme (1)
- Analyst Team (1)
- Data Quality Assurance Team (1)
- Data Monitoring Team (1)
- Information Governance Team (1)
- Data Standards & Terminology Team (2)
- Women & Children Information Programme (1)
- Health & Social Care Information (1)
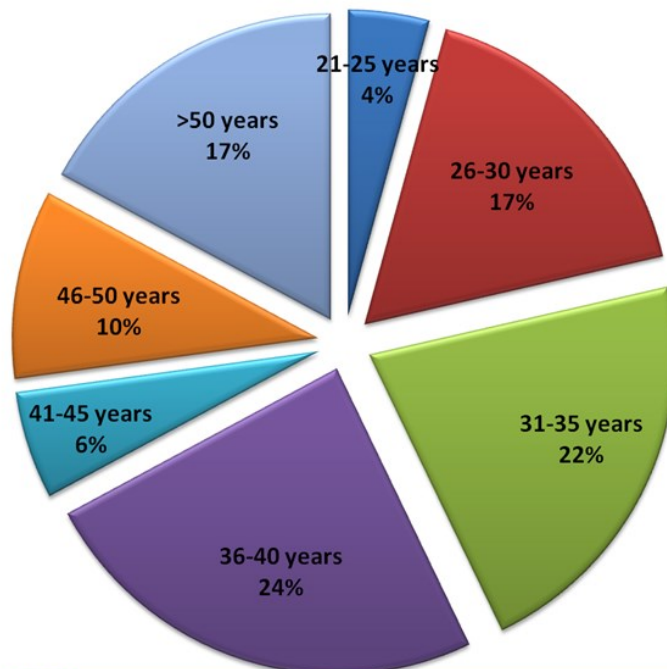- Practice Team Information (PTI) Team (1)

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Survey of Population (n=70)

Gender

Male
40%

Female
60%

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Main work area

- Team A 30%
- Team B 17%
- Team C 21%
- Team D 20%
- Team E 12%

Age group

- 21-25 years 4%
- 26-30 years 17%
- 31-35 years 22%
- 36-40 years 24%
- 41-45 years 6%
- 46-50 years 10%
- >50 years 17%

Years of service

- ≤ 1 year — 8%
- 2 years — 7%
- 3 years — 7%
- 4 years — 8%
- 5 years — 13%
- 6 years — 14%
- 7 years — 9%
- 8 years — 9%
- 9 years — 6%
- ≥ 10 years — 19%

The Draft Model of Information Behaviour

The Internal Information Environment of the Provider

Triggers of information behaviour · Information sources · Information acquisition behaviour · Information production behaviour · Information dissemination behaviour · Feelings · Perceived internal impact · Collaborative Information behaviour · Multitasking Information behaviour
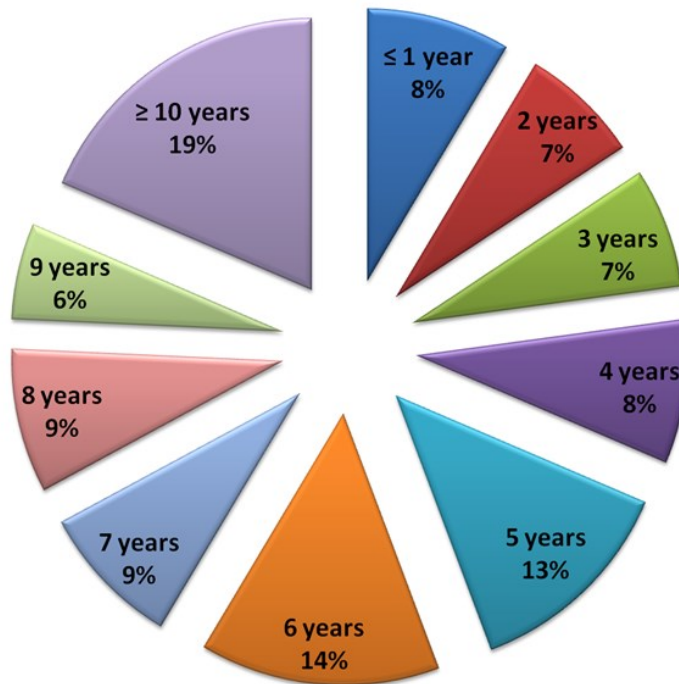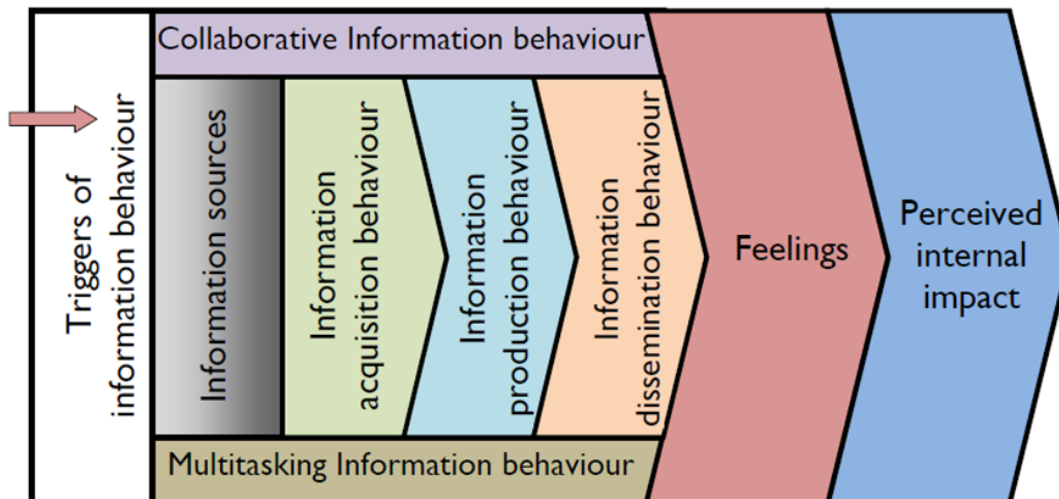
Revisiting the questions

- Do the themes and categories make sense?
- Do you believe they represent your experiences?
- Which categories or sub-categories would you remove?
- Which categories or sub-categories would you refine or add?
- Any comments on the survey results?
- What would a final model look like?
- Do you have any general comments?

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