CHAPTER 9

Information behaviour

> One thing we know now . . . is that underlying human propensities with regard to information emerge again and again, as each new technology becomes familiar and its use second nature.
>
> Marcia Bates (2010, 2385)

> All people are individuals and will seek and use information in different ways . . . [information gathering] is an integral part of our personalities, and we all do it differently. There is no such thing as a homogenous body of information users.
>
> Maurice Line (1998, 223)

Introduction

Information behaviour, the ways in which it is studied, and the significance for practice of the results of such studies, are central topics within information science. Without reliable knowledge of the way in which people find and use information, provision of effective services can be based only on guesswork and prejudice.

This has been a very popular area of information research, and one of the richest for the creation of models and frameworks to explain the complex data produced.

As Case (2006, 295) writes, the information behaviour literature presents a 'bewildering array of topics, populations, samples, sites, theories and methods. Readers wishing to investigate this topic in depth are well served by numerous thorough and detailed overviews, including books (Case, 2007; 2012), review articles (Wilson, 2000; Pettigrew, Fidel and Bruce, 2001; Case, 2006; Savolainen, 2007; Fisher and Julien, 2009; Julien, Pecoskie and Reed, 2011) and encyclopaedia articles (Bates, 2010). Urquhart (2011) even provides a review of recent reviews, while Case (2006) identifies sources reviewing older material. Faced with this plethora of material, this chapter will try only to draw out the main issues and findings, and provide some examples.

We will first consider the question of what information behaviour is, and how it relates to similar ideas, and then briefly outline the historical development of the subject, emphasizing the different ways it has been regarded and studied. A section of theories and models takes a very select look at the wide variety which

have been proposed, followed by a summary of research methods used. We then look at some examples of studies of the information behaviour of different groups, and at the idea of individual styles of information behaviour. The summary section looks at what general lessons have been learned about information behaviour.

What is information behaviour?

'Information behaviour' has two connotations, nicely summarized by Bates (2010, 2381) as:

> the many ways in which human beings interact with information, in particular the ways in which people seek and utilize information ... [and also] ... a subdiscipline [of library and information science] that engages in a wide range of types of research conducted in order to understand the human relationship to information.

It is usually defined in a rather broad way. Wilson (2000, 49), for example, defined it as:

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

Some commentators, such as Case (2006) have warned against too wide a broadening of scope; ultimately there may be nothing in the information sciences which could not be called 'information behaviour'. They suggest that system evaluations, searching strategies, etc., should be left outside the definition, and this is the approach taken in this chapter. Wilson (1999) gave a useful pictorial model of the components of information behaviour, shown in an expanded form in Figure 9.1 below.

This shows 'information behaviour' as a wide concept, set within the whole of an individual's life world. Within it is 'information seeking': the purposeful activities of looking for information to meet a need, solve a problem, or increase understanding. Within that, in turn, is 'information retrieval': the seeking for some definite information within some kind of information system.

The idea of information behaviour, and its more specific components, is closely tied up with two other concepts: information use and information need. Information use was discussed in Chapter 4, where we saw that it was far from a simple concept; see Savolainen (2009) and Fleming-May (2011). The idea of

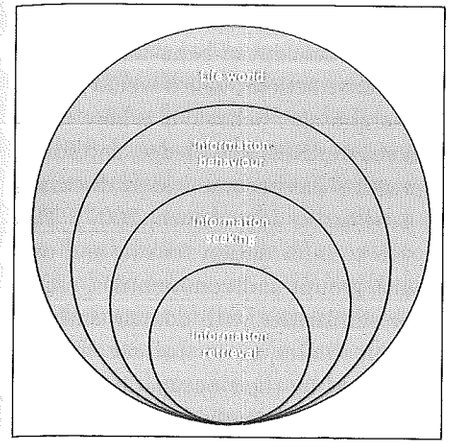

Figure 9.1
The nested model of information behaviour

an 'information need' poses similar problems. Information needs (or 'wants' or 'demands') are a part of overall information behaviour, and can only be understood in the wider context of the use of information in work, in study and in life generally. They may be expressed explicitly – 'what I want to know is ...' – or implicitly – 'I am a doctor (so obviously I need to know about) ...'. Over 30 years ago, Wilson (1981, 5) commented that 'within the field of user studies the investigation of "information needs" has presented seemingly intractable problems ... progress towards some theoretical understanding of the concept of "information need" has been slow'. The situation has not improved much since then, Case (2007, 69) writing that 'not only has a definition of "information need" been difficult to establish, describing exactly how it influences human behavior has also been controversial.'

There is no accepted definition of an information need, though there have been numerous suggestions (Case, 2012, Chapter 4). Most revolve around the idea of a need being some kind of 'recognized gap' between what one knows and what one wants to know: associated with a desire to seek answers, reduce uncertainty, or make sense.

The whole idea of an 'information need' is a contested concept, some writers arguing that there is no such thing. Some scholars argue either that information needs are 'really' other kinds of need – so that a need for information on the location of the nearest pizza restaurant is 'really' an expression of a need for food – or that information needs are 'only' an expression of a psychological state of mind.

In any event, it is clear that an information need is an abstract concept. Not directly observable, such needs exist only 'inside someone's head'. Observation can give only indirect information about such needs. They can only be found directly by asking someone to describe their own need, which they may find difficult to do, as the needs may be implicit, too obvious to be mentioned, not recognized, etc.

Returning to the idea of information behaviour, there have been two objections to the term itself (Savolainen, 2007). One is grammatical; information cannot behave, so the correct term should be 'information-related behaviour'. While recognizing the validity of this point, we accept that the grammatically incorrect

term is ubiquitous, so we use it here. The second is more substantial: 'behaviour' has connotations of the discredited psychological concept of behaviourism, and could be taken to be limited to observable, objective actions, which would greatly limit the scope of the idea. However, in general usage, behaviour is here taken to include cognitive behaviour: needs, opinions, motives, knowledge, and so on.

The alternative concept of 'information practice' has become widely discussed since 2000, although the phrase had been used earlier (Savolainen, 2007). This approach brings a more sociological approach to information seeking and use, treating them and phenomena associated with groups and communities, rather than with individuals; it therefore has some similarities with domain analysis, discussed in Chapter 5. Although many previous studies, as we shall see, focused on groups of individual information users defined by their occupation or role, information practice considers information activities to be embedded in the wider social practices of the group, and particularly on the cultural factors affecting information sharing. Savolainen (2007) gives a review of the concept, and a distinction from information behaviour; an early study of 'everyday life information seeking' based on the idea provides a good example (McKenzie, 2003). The term 'information work' (not to be confused with the use of that phrase to mean the work of an information specialist) has also been used to imply something rather similar to information practice; see Savolainen (2007) for a discussion, and Palmer and Neumann (2002) for an example, in a study of humanities scholars.

Notwithstanding these developments, we will use information behaviour as the umbrella term for the remainder of this chapter.

As was just noted, we will not in this chapter look at studies of the way in which people use particular information systems. This is the area of human-computer interaction (HCI), usability, system evaluation, and search strategies and tactics. These have, of course, an overlap with more general information behaviour; they are presented in an integrated way, for example, in Chowdhury and Chowdhury's 2011 book on 'users and usability'. These are considered in the chapter dealing with information technologies.

Origins and development of information behaviour studies

A specific concern for users of information has been evident from the earliest days of the information professions. Bates (2010) reminds us that Samuel Green, one of the founders of the library profession in the USA, who began his 1891 Presidential Address to the American Library Association with 'The function of the library is to serve its users', was writing as early as 1876 that librarians should 'mingle freely' with their users, and 'help them in every way' (Green, 1876, 78). However, although Green pointed out that one benefit of such mingling was that 'you find out what books the actual users of the library need ... what subjects the constituency of the institution are interested in, and what is the degree of

simplicity they require in the presentation of knowledge', systematic research into the needs and behaviours of users came only later.

The early developments are outlined by Wilson (1994; 2000; 2008), who identifies studies of library use and users dating back to 1916, reviewed by McDiarmid in 1940. However, like much else in the information sciences, research into information behaviour was stimulated by a concern for improved methods for handling scientific and technical information, catalysed by the 1948 London conference of the Royal Society, at which use of documents and libraries was discussed. By the time of the follow-up 1958 Washington conference on scientific information, a significant part of the programme was devoted to information needs and sources.

As a consequence, the first major programme of research on the topic was carried out during the 1950s and 1960s on the information needs and behaviours of academics and practitioners in STEM (science, technology, engineering and medicine) subjects, mainly using quantitative surveys. These early studies are reviewed by Menzel (1966) and Meadows (1974). From this first phase of information behaviour research activity emerged many ideas of wider significance, such as the 'information gatekeeper' (a person who acts as an information resource for colleagues) and the 'invisible college' (a network for communicating academic and professional information outside the formal publication process).

During the 1960s and 1970s, there was an expansion of interest in information behaviour relevant to the social sciences, including business and management; initially that of academic and professional groups in the area, and then spreading to an interest in 'ordinary people', and to information from outside formal published sources. Project INISS, a major study of information needs and behaviour in UK social services, is a good example, and was highly influential in the development of concerns and methods (Streatfield and Wilson, 1982). These developments were fuelled by an enthusiasm, particularly in the USA, for 'evaluation' studies of government programmes to address poverty, inequality, poor education, discrimination, and so on: this provided both new areas for information behaviour studies, and new tools – both quantitative and qualitative – to address them (Bawden, 1990).

The term 'information behaviour' began to be used widely during the 1970s; previously such research had been classed as 'user studies', 'information needs and use', 'communication behaviour', and so on. Coincident with this was a new interest in social science methodology, qualitative studies, and creation of conceptual models of information behaviour (Ellis, 2011).

Only during the 1990s did attention turn to the information behaviours of academics and practitioners in the arts and humanities. This progress of interest in information behaviours – beginning with the STEM subjects, progressing to the social sciences, and culminating with the humanities – both is a response to the

external factors noted and also reflects the general advancement of information services in different domains. The introduction of online information services, for example, and other technological developments followed exactly the same pattern. Given that much of the focus of behaviour studies has been in seeing how people adapt to new information technologies, the way they have developed is understandable. From the 1980s, much attention was paid to the use of digital tools: online and CD-ROM databases, online catalogues and, later, internet resources.

From 1990 onwards there was a very great increase in academic interest in the area. This manifested itself not just in a larger number of studies, but also an increase in the range of research methods used, and of theories, models and frameworks adopted; both methods and models will be discussed below. The concept of 'information seeking' as an area of study emerged, broader than user studies or information retrieval and allowing for greater consideration of the context in which the information was sought and used.

Theories and models

Information behaviour is the area within the information sciences which has led to the greatest proliferation of theories and models; the 2005 book edited by Karen Fisher, Sandra Erdelez and Lynne McKechnie lists no fewer than 73. We will make no attempt to list, still less discuss and compare them all. Rather, we will give a categorization, and briefly describe some important examples; readers with an interest in the topic will find further information on these examples, and others, in Case (2006; 2012), Wilson (1999; 2010), Fisher and Julien (2009), Fisher, Erdelez and McKechnie (2005), Pettigrew, Fidel and Bruce (2001) and Robson and Robinson (2012). We also show some of the models in diagram form, as this helps make their nature immediately obvious; note, however, that most have extensive text description to go with the pictures. While most of these models have been derived by information science researchers, there is some overlap with models originating in communication science (Robson and Robinson, 2012; McQuail and Windahl, 1993).

It is difficult to distinguish clearly between a 'theory' and a 'model' in this subject and so we will consider them together. 'Theories' here are usually qualitative descriptions and explanations, rather than the mathematical and predictive theories used in the sciences. 'Models' are generally rather simple 'conceptual models', taking the form of flow charts or diagrams; very different from the mathematical models used in science and economics, and the physical or computer models used by architects to picture new buildings and by chemists to display the structure of chemical substances. Their aim is to show the factors involved in information behaviour, and how they relate to one another, to depict the stages and processes of information seeking and use, and sometimes to illustrate a person's thought processes and changing cognitive state as they deal with information (Wilson, 2010; Järvelin and Wilson, 2003).

The idea of conceptual models for information behaviour has been advocated most strongly by Tom Wilson over many years. Wilson, a British information science professor who has spent most of his career at Sheffield University, was one of the leaders in the investigation of information use in the social sciences, and in the application of qualitative methods for studying information behaviour. He was instrumental in establishing the series of 'Information Seeking in Context' (ISIC) international conferences, which have been very influential in promoting the study of the wider contexts of information use. His 1981 paper 'On user studies and information needs' was the first to try to establish a set of definitions and models for the area, and was highly influential (Bawden, 2006). He has derived a number of information behaviour models, whose development he reviews in Wilson (1981; 1999; 2005; 2010).

We can divide the numerous models of this area into four rough categories, depending on their purpose and scope.

Descriptive models

The first class of models we may call *descriptive*. These simply list the factors and activities involved in the aspects of information behaviour being considered; they may be presented graphically or just as a list.

The earliest of these was a diagrammatic representation of a very general information communication model, showing relations between users and information resources, mediated by technology and tools, published by Tom Wilson (1981), and shown, in a simplified form, in Figure 9.2 on the next page.

A later model in this category, and one which attracted much interest, was the behavioural model, derived by David Ellis, another British information science professor originally from the Sheffield school, and now at the University of Aberystwyth. The model, developed in two stages (Ellis, 1989; Ellis, Cox and Hall, 1993), identified eight features of behaviour within information seeking:

- starting – activities at the start of information seeking
- chaining – following references, citations, etc.
- browsing – scanning areas of interest
- differentiating – filtering material by source and quality
- monitoring – keeping up to date by checking sources regularly
- extracting – systematically working through a source
- verifying – checking accuracy of information
- ending – concluding steps.

The model does not define the interrelations between the features, nor the order in which they are carried out; that is determined for each situation. This has

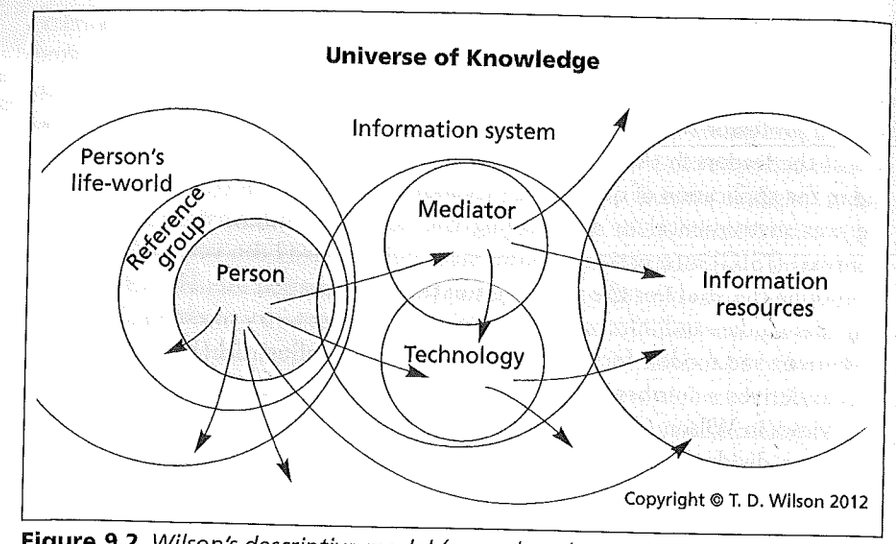

Figure 9.2 *Wilson's descriptive model (reproduced courtesy of Tom Wilson)*

been one of the most tested of all information behaviour models, having been used with studies of groups including scientists and engineers, lawyers, web users and social science researchers.

Process models

Models of this first kind have the limitation that they simply enumerate or display the stages or activities of information seeking, and the entities which affect them. The second class of models for information behaviour comprises *process* models, showing what happens in what order for the information behaviour being illustrated; typically, these are represented as flow-charts or process diagrams.

Wilson (1981) was again the innovator here, deriving the model shown (in a slightly revised form) in Figure 9.3, which is often termed Wilson's first model; he acknowledged its limitations, suggesting that it was little more than a map of the area to be explored, with little explanatory power.

A similar simple model was produced by Krikelas (1983). Later models of this kind were based on studies of occupational groups, and included specific mention of tasks and work roles. Examples are the models of Byström and Järvelin (1995) and of Leckie, Pettigrew and Sylvain (1996); the latter is shown in Figure 9.4.

This model has been used with groups including engineers, lawyers, doctors, nurses and dentists.

Cognitive models

The previous class of models has the limitation that they can, for the most part,

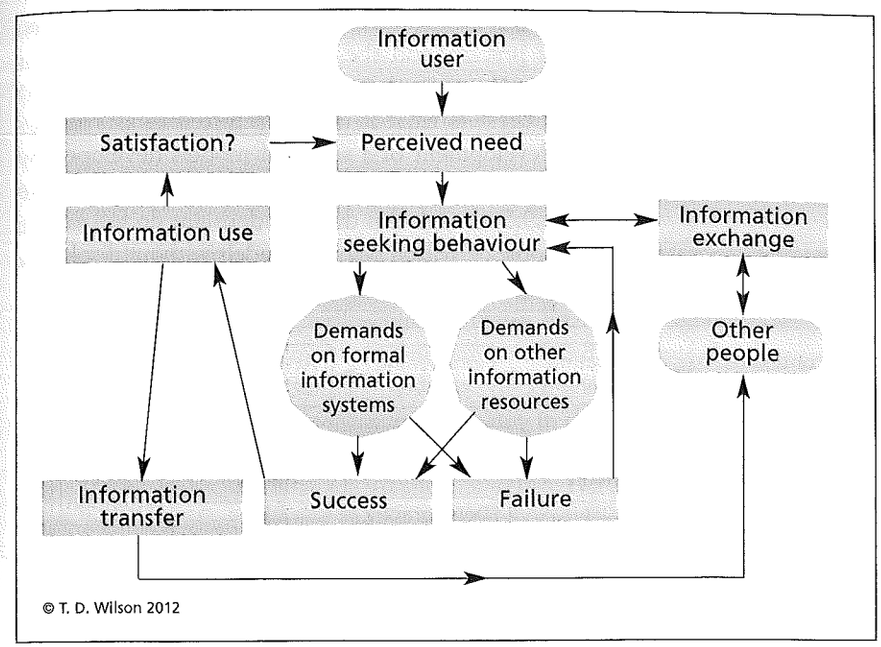

Figure 9.3 *Wilson's first model of information behaviour (reproduced courtesy of Tom Wilson)*

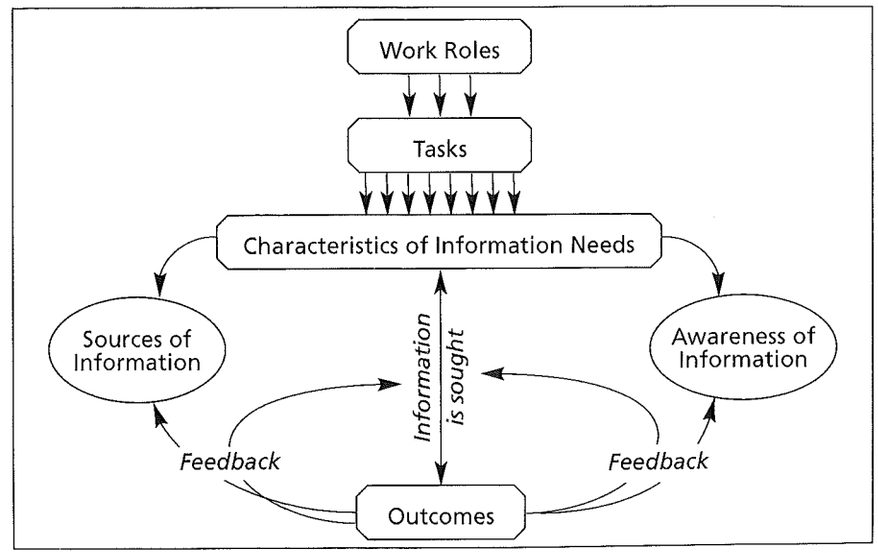

Figure 9.4 *Leckie's 'professional information seeking' model (reproduced from Leckie, Pettigrew and Sylvain, 1996, by permission of University of Chicago Press)*

show only observable behaviours and activities. A third category of models, which may be called *cognitive process*, add the thoughts and motivations of people to the actions and entities shown in the second category.

Arguably the best known of these is what is usually referred to as Wilson's 'expanded model'. The final development of a series of models developed by Tom Wilson (Wilson and Walsh, 1996), it added contextual and cognitive elements. It is shown in Figure 9.5, though this diagram does not do full justice to the ideas, since it subsumes some of Wilson's earlier models without displaying all their detail.

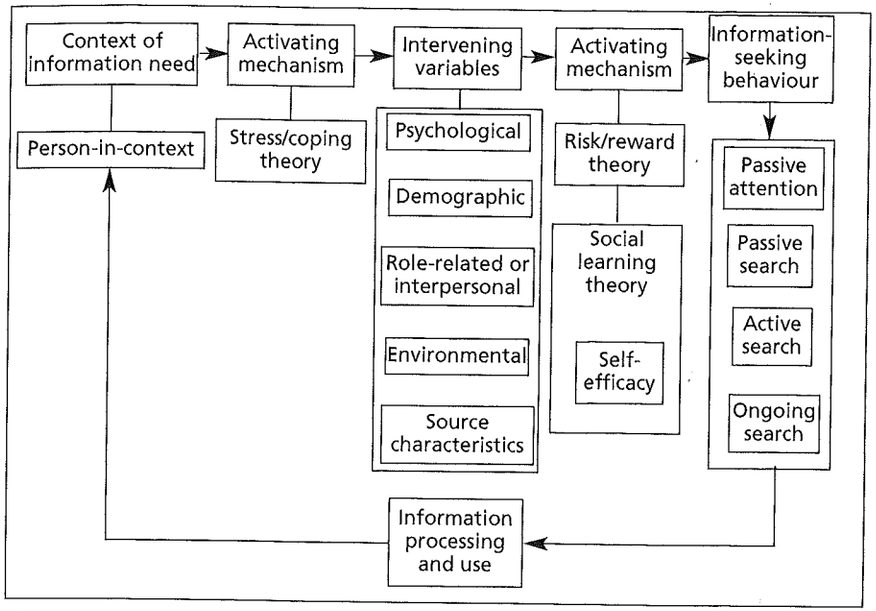

Figure 9.5 *Wilson's expanded model (Reproduced from Wilson and Walsh, 1996. © the British Library Board)*

Other models involving cognitive aspects were presented by Ingwersen (1996), focusing specifically on the information retrieval aspects of information seeking, and by Choo (2006), taking a wider scope of all information needs, seeking and use.

Finally in this category, we should mention the 'information search process' model, derived by Carol Kuhlthau, a library science professor with a long career at Rutgers University. This model, developed between 1980 and 2000, considers six stages of a search process: initiation, selection, exploration, formulation, collection and presentation. For each of these stages, three aspects are described: thoughts, feelings, and actions. This is a rather different kind of model from the

others: it is focused on the user's subjective experience as the search progresses, has to be understood holistically, and is not usually displayed as a diagram (Kuhlthau, 2003; 2005). It has been particularly used in studies of school and college students, and also with occupational groups.

Complex models

The models considered so far all tend to explain information behaviour as a linear, ordered set of stages, and to focus on specifically information-related action and cognition. In the fourth and last category are a group of more elaborate models, which we might call *complex*. These introduce a greater degree of context and an increased number of perspectives, and are typically non-linear or multidirectional, rather than having a single sequence of steps.

The non-linear nature of information seeking in the real world has been most clearly captured in the model devised by Alan Foster, another British academic originally from the Sheffield school and now at Aberystwyth. This model defines three 'contexts of interaction' for the information seeker: external (e.g. the social or organizational setting); internal (e.g. feeling and thoughts), and their cognitive approach (e.g. openness). They influence three 'core processes': opening (e.g. browsing); orientation (e.g. problem definition); and consolidation (e.g. verifying). Behaviour patterns described in this way are likened to an artist's palette, able to be combined in any way, to reflect the dynamic and holistic nature of information seeking (Foster, 2004).

Another in this category, described as a 'comprehensive model of information seeking', and aiming to include factors not included in previous information behaviour models, was devised to explain the information behaviour of cancer patients, although it has also been used with engineers (Johnson, 1997; Johnson, Andrews and Allard, 2001). Using some of the ideas of Dervin's Sense-Making (see below), it focuses on the factors relating to people and sources, and on the reasons for particular forms of information seeking, rather than the details of information seeking, and is shown in Figure 9.6 on the next page.

Other models in this category include two 'general models of information behaviour'. Niedzwiedzka (2003) develops Wilson's expanded model, by extending it to broader areas of information behaviour and emphasizing the character of the activities. Godbold (2006) combines Wilson's model with that of Ellis and with Dervin's Sense-Making to the same ends. Another model of this kind develops Ingwersen's original cognitive model in similar ways (Ingwersen and Järvelin, 2005).

While these more sophisticated models undoubtedly capture more of the complexity of information behaviour in the real world, this very fact means that it is less easy to employ them in the straightforward way that the simpler models can be used.

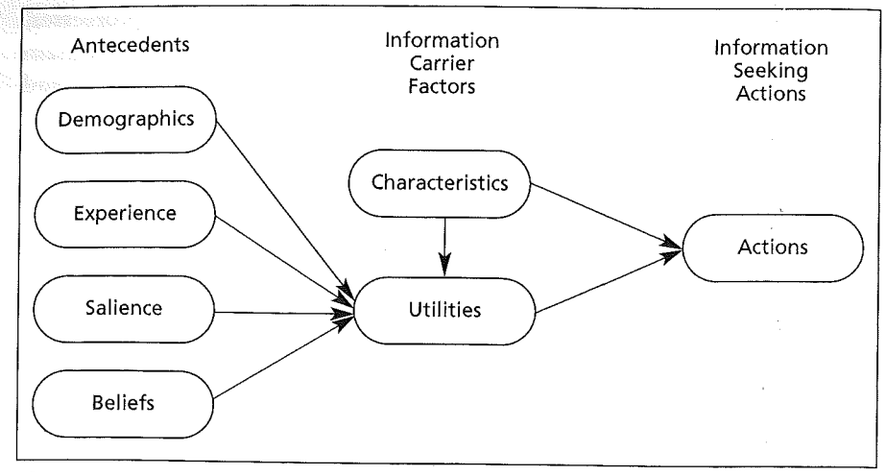

Figure 9.6 *Johnson's 'comprehensive model of information seeking' (reproduced from Johnson, Andrews and Allard, 2001, by permission of Elsevier)*

Individual perception theories

Another approach to explaining information behaviour has been to put forward theories or frameworks based on a constructivist approach, focusing on the subjective perceptions of individuals as they go about dealing with information. Usually a very wide scope is taken in what counts as information behaviour; there is certainly no limitation to formal sources and retrieval processes.

Of these theories, the most influential has certainly been Brenda Dervin's 'Sense-Making' methodology (always with a capital 'S' and 'M', to indicate the specific use of the phrase). Dervin, a US academic whose work straddles the information and communication sciences, has developed the idea over several decades, to provide a very general methodology, rather than a specific model or theory, for understanding how people derive meaning from information, and thereby understand their information behaviour in the widest sense (Dervin, 2005; Dervin, Foreman-Wernet and Lauterbach, 2003; Savolainen, 2006). The ideas, as noted above, have influenced several more specific models of information behaviour.

There are other examples of this kind of theory, of which we will mention four well known ones. Reijo Savolainen's 'everyday life information seeking' (ELIS) gives a holistic framework for understanding the social and psychological factors underlying the way people use information in everyday settings (Savolainen, 1995; 2005). Elfreda Chatman's 'life in the round' or 'small world' theories similarly seek to explain the everyday information behaviour of people in their social context (Chatman, 1999; Fulton, 2005). The 'information grounds' theory, developed by Karen Pettigrew and Karen Fisher, concentrates on the detail of the social contexts in which people find and share information (Fisher, 2005). These are many and varied; as well as libraries and information centres, they include clinics, playgrounds, shops, restaurants, and transport settings. Finally, Sandra Erdelez's concept of 'information encountering' focuses on the ways in which people make unexpected discoveries of interesting information, and the extent to which they actively seek to make this happen (Erdelez, 2004).

Evolution and ecology

Finally, in our rapid survey of models and theories of information behaviour, we should mention two general approaches which have arisen from analogies with the biological world. *Information ecology* examines the contexts of information behaviour by analogy with ecological habitats and niches, identifying behaviours in biological terms such as 'foraging' (see, for example, Nardi and O'Day, 1999; Pirolli, 2007; and Huvila, 2009), while Amanda Spink (2010) has put forward an evolutionary perspective for information behaviour.

Methods for studying information behaviour

We will consider information research methods in Chapter 14, but we should note here that a wide variety of research methods has been used to investigate information behaviour. The texts and reviews mentioned above give more details and examples; the books by Donald Case (2007; 2012) are particularly helpful. In summary, we can say that interviews of one kind or another have been the most common method, but many others have applied to some extent, including: questionnaires; telephone and web surveys; focus groups; observation; diaries, logs, audio journals, and photo diaries; think aloud; ethnography, critical success factors, critical incidents, and vignettes; web log analysis; content and discourse analysis; document analysis; and meta-synthesis of the literature.

In general terms, there has been a move from largely quantitative survey methods, almost universal in the first decades of 'user studies', to greater use of in-depth qualitative techniques, as interest has moved towards investigating information behaviour in wider contexts. The focus has similarly changed. Initial studies were generally carried out from a systems perspective, investigating which systems and services were used, by whom, and to what extent, with limited consideration of the purpose or success of their use. Later studies considered the information behaviour of individuals, from a cognitive viewpoint, while a primarily social viewpoint, including detailed consideration of information in the wider context of the life and work of social groups, followed.

As a simple illustration of the range of methods currently employed, the following list shows a selection of papers published between 2008 and 2011, with a note of the methods used.

Information behaviour research examples

Krampen, G., Fell, C. and Schui, G. (2011) Psychologists' research activities and professional information-seeking behaviour, *Journal of Information Science*, 47(4), 439–50. [Online survey.]

Vilar, P. and Žumer, M. (2011) Information searching behaviour of young Slovenian researchers, *Program*, 45(3), 279–93. [Computer session recordings, questionnaires.]

Lu, L. and Yuan, Y. C. (2011) Shall I Google it or ask the competent villain down the hall? The moderating role of information need in information source selection, *Journal of the American Society for Information Science and Technology*, 62(1), 133–45. [Interviews, questionnaires.]

Bartlett, J. C., Ishimura, Y. and Kloda, L. A. (2011) Why choose this one? Factors in scientists' selection of bioinformatics tools, *Information Research*, 2011, 16(1), paper 463, available from http://InformationR.net/ir/16-1/paper463.html. [Diaries, interviews.]

Pilerot, O. and Limberg, L. (2011) Information sharing as a means to reach collective understanding: a study of design scholars' information practices, *Journal of Documentation*, 67(2), 312–33. [In-depth interviews, discourse analysis.]

Mason, H. and Robinson, L. (2011) The information-related behaviour of emerging artists and designers: inspiration and guidance for new practitioners, *Journal of Documentation*, 67(1), 159–80. [Online questionnaires.]

Brine, A. and Feather, J. (2010) The information needs of UK historic houses: mapping the ground, *Journal of Documentation*, 66(1), 28–45. [Postal questionnaires and interviews.]

Robinson, M. A. (2010) An empirical analysis of engineers' information behaviours, *Journal of the American Society for Information Science and Technology*, 61(4), 640–58. [Self-reporting using PDAs.]

Niu, X. et al. (2010) National study of information seeking behavior of academic researchers in the United States, *Journal of the American Society for Information Science and Technology*, 61(5), 869–90. [Web-based in-depth questionnaire.]

Medaille, A. (2010) Creativity and craft: the information seeking behavior of theatre artists, *Journal of Documentation*, 66(3), 327–47. [Online questionnaires and interviews.]

Nicholas, D. et al. (2010) Diversity in the e-journal use and information-seeking behaviour of UK researchers, *Journal of Documentation*, 66(3), 409–33. [Web log analysis.]

Martinez-Silveira, M. S. and Oddone, N. (2009) Information-seeking behavior of medical residents in clinical practice in Bahia, Brazil, *Journal of the*

Medical Library Association, 96(4), 381–84. [Questionnaire, critical incidents.]

Tenopir, C., King, D. W., Edwards, S. and Wu, L. (2009) Electronic journals and changes in scholarly article seeking and reading patterns, *Aslib Proceedings*, 61(1), 5–32. [Questionnaires, critical incidents, comparison over time.]

Hider, P. N., Griffin, G., Walker, M. and Coughlan, E. (2009) The information seeking behaviour of clinical staff in a large health care organization, *Journal of the Medical Library Association*, 97(1), 47–50. [Postal questionnaires.]

Hemmig, W. S. (2008) The information seeking behaviour of visual artists: a literature review, *Journal of Documentation*, 64(3), 343–62. [Literature analysis.]

Trotter, M. I. and Morgan, D. W. (2008) Patients' use of the Internet for health related matters: a study of Internet usage in 2000 and 2006, *Health Informatics Journal*, 14(3), 175–81. [Questionnaires, comparison over time.]

Reddy, M. C. and Spence, P. R. (2008) Collaborative information seeking: a field study of a multidisciplinary patient care team, *Information Processing and Management*, 44(1), 242–55. [Ethnography.]

Inskip, C., Butterworth, R. and MacFarlane, A. (2008) A study of the information needs of the users of a folk music library and the implications for the design of a digital library system, *Information Processing and Management*, 44(2), 647–62. [Context analysis, conceptual framework derived, individual interviews.]

Miranda, S. V. and Tarapanoff, K. M. A. (2008) Information needs and information competencies: a case study of the off-site supervision of financial institutions in Brazil, *Information Research*, 13(2), paper 344, available from http://informationr.net/ir/13-2/paper344.html. [Content analysis, interviews, focus groups, observation, document analysis.]

Information behaviour of groups

Information research has focused on a wide variety of groups of user, becoming wider as time has passed, from an initial focus on academic and professional groups; again, the texts and reviews give full details. We give some examples of the kind of groups studied below, following Case (2006; 2007; 2012) in categorizing the groups studied as defined by occupation or discipline, by role or by demographic status. Occupational groups have been most studied, and almost all research has been carried out in the developed world. For examples of the limited number of studies in the developing world, see Mooko (2005) and Musoke (2007). Some examples of groups studied are:

By occupation or discipline

Scientists, engineers, doctors, nurses, pharmacists, social scientists, humanities scholars, psychologists, industrial managers, journalists, lawyers, farmers, artists, police officers, arts administrators, theologians, architects, teachers, janitors.

By role

Patients, carers, students, researchers, professors, citizens, job-seekers, genealogists, hobbyists (e.g. cooks, coin buyers, knitters), library users, shoppers, readers, internet users.

By demographic

Children, teenagers, women, mothers, older people, immigrants, poor people, homeless people, retired persons. Inhabitants of particular countries or areas, ethnic minorities.

Copious individual examples are given in the books and general review articles noted above. For readers interested in an overview of the kind of studies involved, and the understanding gained, there are overviews for all categories. As examples of reviews of the literature on studies by occupation or discipline, see Case (2007) (scientists and engineers, lawyers, journalists), Robinson (2010) (healthcare workers), Hemmig (2008) (visual artists) and Kloda and Bartlett (2009) (rehabilitation therapists). As examples of reviews by role, see Case (2007) (citizens, consumers, patients, students) and Savolainen (2008) (unemployed people, environmental activists); and as examples of reviews by demography, see Urquhart and Yeoman (2010) (women), Caidi, Allard and Quirke (2010) (immigrants), Spink and Heinström (2011) (young children) and Dutta (2009) (inhabitants of developing countries).

Individual information behaviour styles

As we have seen, several of the models and frameworks mentioned above focus on the individual information user; their actions, thoughts and motivations. An interesting extension of this is to try to determine, and label or categorize, an individual's typical pattern of information behaviour, which we might call their 'information style'.

This area has been reviewed in detail (Bawden and Robinson, 2011), so here we will only mention some main points and examples. Much of the work in this area has analysed the relation between personality factors and interaction with computer systems, typically web searching; as with search strategies and tactics, this is a 'micro' level of information behaviour which was discussed in Chapter 7.

One way in which this kind of 'information style' emerges is as an almost

accidental by-product of a wider study. An early example is that of Palmer's study of scientists working at an agricultural research organization, based on semi-structured interviews and questionnaires (Palmer, 1991a; 1991b). Cluster analysis of the results showed the participants falling into five groups, which were denoted as:

- 'non-seekers', for whom information access was not a priority
- 'lone, wide rangers', preferring to work alone, reading and scanning widely, and relying on serendipitous information discovery
- 'unsettled, self-conscious seekers', concerned about missing important information
- 'confident collectors', amassing their own information collections, rather than routinely searching for information
- 'hunters', with regular information-gathering routines, and a focus on currently relevant information.

Palmer then went on to derive an alternative and, by her description, subjective six-fold typology, based on her appreciation of participants' information habits, and including such factors as appearance, body language and intonation in response to questions:

- 'information overlord', operating an extensive and controlled information environment
- 'information entrepreneur', creating an information-rich environment, using many sources and strategies
- 'information hunter', organized and predictable information gatherer, in narrowly focused areas
- 'information pragmatist', occasional gatherer of information, only when need arises
- 'information plodder', rarely seeking information, relying on own knowledge or personal contacts
- 'information derelict', seeming to neither need nor use information.

Classifications of this kind are great fun and may spark insights, and there are a number in the literature; however, they are never consistent with one another, and their objective validity has to be doubted.

Another, and more systematic, approach is to try to determine information behaviour by some kind of survey, and then to compare the results with personality as assessed by some psychometric test. An example is the work of Jannica Heinström (2003, 2005), who assessed information behaviour of students by survey, identifying three behavioural patterns: fast surfing, broad

scanning and deep diving. These behaviour patterns could then be related to personality and learning style, identified from another survey. For example, the fast surfing behaviour – associated with a rapid search for a few highly relevant documents, ideally supporting already formed viewpoints – was related to neuroticism, to cautiousness (low openness to experience) and to carelessness (low conscientiousness), as well as to a typically superficial and non-strategic approach to study. These ideas have been elaborated in a book, which identifies five 'information attitudes', linked to personality traits, and resulting in typical patterns of information behaviour: invitational; exploring; purposeful; passive; and avoiding (Heinström, 2010).

These studies, and others reviewed by Bawden and Robinson (2011), open the intriguing potential for a categorization of individual information behaviour. Knowledge of individual 'information styles' could be valuable for information service provision in several ways, such as customization of interfaces, or provision of training and support in the most appropriate way; it has long been recognized that information users, even with the same subject interests and same education level, cannot be treated as a homogenous mass (see, for example, Line, 1998). However, we still have no agreed method for determining such styles reliably.

Summary: so what do we know?

There have been, as the account above makes clear, very many studies of information behaviour. These have produced much information about the detailed behaviours of many different kinds of people: from the academic and professional groups who were the main focus of early studies to the much more diverse groups and individuals studied since. While there is therefore a large body of good evidence to support the practice of information provision to a variety of user groups, it is not so clear that many general findings have emerged. What, after over 50 years of effort, do we know about information behaviour in general?

As the quote from Marcia Bates which opened this chapter reminds us, one thing we know is that technology does not change our basic ways of dealing with information, although the details of sources and systems, search tactics and access methods, will obviously change markedly.

One general finding is that, the more carefully it is investigated, the more subtle and differentiated information behaviour is found to be. Behaviours are often not what would be expected; sometimes they are counter-intuitive, and sometimes difficult to interpret.

The law which governs information behaviour has been found, over and over again, to be Zipf's law of least effort. Familiarity of sources, and ease of access and use, is usually (though not invariably) more important than perceived quality. This principle is sometimes expressed as the 'good enough', sometimes as 'satisficing'; it can be found in virtually all information environments.

Perhaps, to the chagrin of an early generation of information researchers, who believed that their findings would be used mainly to improve traditional library and information services, personal and informal sources have always held a very high place, in academic and professional contexts as well as with the general public. The ubiquity of social media now raises this effect to a new level. Similarly, unstructured and serendipitous information seeking is often found to be more important than the use of formal sources in a structured way.

Domains are important. To a large extent information behaviour is correlated with membership of a domain: occupation, academic discipline, role, etc. But, as the opening quote from Maurice Line reminds us, that is not the whole story: individual personality is important, even if we do not yet have a reliable way of assessing individual information styles.

Information behaviour cannot be considered in isolation; we need to explicitly understand the wider context. Information skills and behaviour are usually pragmatic and problem-based: most of the time, people are trying to solve problems, to make sense of the world, and to do things, not to find information for its own sake. Experience has shown that the more context can be brought into the understanding of information behaviour, the more realistic and helpful are the results.

There are now many alternative models for information behaviour: a good indication that none is wholly adequate. The recent trend is to try to combine and improve them, rather than to create new ones. Similarly, the initial trend for quantitative surveys, and the subsequent enthusiasm for qualitative methods, have been replaced by the recognition that both are needed; the subject is too complex for any single solution.

- Information behaviour has been studied for over 50 years, using a wide variety of research methods.
- There are numerous conceptual models and qualitative theories accounting for different aspects of information behaviour.
- Information behaviour is determined primarily by domain (occupation, academic subject, etc.) but is also affected by personality differences.
- A great deal is known about information behaviour within particular domains, but there are few general principles.

Key readings

K. E. Fisher, S. Erdelez, and L. E. F. McKechnie (eds), *Theories of information behavior*, Medford NJ: Information Today, 2005.
[A very accessible set of short descriptions of many theories and models.]

Donald Case, *Looking for information: a survey of research on information seeking, needs and behavior* (3rd edn), Bingley: Emerald, 2012.
[A thorough and detailed coverage of all aspects, equally valuable for reference as for tutorial reading; the two earlier editions of the book are also valuable for older material.]

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CHAPTER 10

Communicating information: changing contexts

We are all patrons of the Library of Babel now, and we are the librarians too.
James Gleick (2011, 426)

If you want to truly understand something, try to change it.
Kurt Lewin, German-American psychologist

It is not necessary to change. Survival is not mandatory.
W. Edwards Deming, American statistician

Introduction

In this chapter, we will look at some of the changes which have occurred, and are still occurring, to the way in which recorded information is communicated. These changes are largely a result of new technologies, specifically the 'digital transition' to a world in which most information is in digital form most of the time, but also reflect economic and social factors.

The significance of these changes for the information sciences is two-fold. The environment in which information practitioners work is very different indeed to what it was 30 years ago, and we may expect it to change equally dramatically in the coming decades. A full understanding of these changes, and an appreciation of what is to come, is essential for effective information provision. Perhaps more positively, the information sciences can make very significant contributions to steering these changes, so as to take best advantage of new capabilities without losing the best of past practices.

We will mainly consider the present situation in this chapter, having looked at historical developments in Chapter 2, and leaving consideration of future trends to the final chapter. We will first look at some general frameworks to help understand the issues, before examining the digital transition from the print-based information environment, changing economic factors and new forms of recorded communication. We will then look at some new forms of research and scholarly activity which both take advantage of, and contribute to, new communication formats, and conclude with a reflection on changing information spaces and places.