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## The Importance of Accessing and Browsing Information and Communication

It is well understood that in the last generation the United States and other developed countries have become information societies, where most of the economy, and the central nature of work, is involved in creating, processing, communicating, using, and evaluating information. Major social changes emphasizing the importance of information seeking include rapidly increasing knowledge work and cognitive demands from digitized symbols, interconnectedness of and interaction with information technologies and networks, and forms, sources, and amounts of information (Marchionini 1995, 3–4).

Information seeking is an enduring topic of theoretical, practical, and economic relevance, treated in many textbooks, research studies, commercial products, and university courses that consider the processes and outcomes of people's attempts to acquire and use information. Further, with the development of the Internet, online databases, CD-ROMS, interactive retrieval interfaces, and digital libraries comes the promise of nearly unlimited retrieval of information.

At the same time, however, a new focus on the user and the user's context has developed to challenge many of the traditional approaches to the design of information systems and the study of information seeking. Further, there are many concerns about increasing information inequity and the "digital divide," whereby many people and groups may be excluded from this growth in information services and opportunities. Many people complain of overload, confusion, frustration, becoming lost, not knowing where to go to find what they need, or not being able to interpret and evaluate information after obtaining it.

This book argues that many of these tensions, contradictions, and challenges arise from an incomplete conceptualization of what has been traditionally (but less so recently) called the information-seeking process. This traditional approach conceives of information seeking as an intentional process whereby a user, with a more or less known problem, uses some kind of information resource (usually a print or

computer medium, such as a library's card catalog or online catalog or the Internet) to find some specific facts or data that would resolve the problem. Typically, this process takes the form of matching a user's search query with terms from a database of indexed key words or even full text.

However, this traditional, narrow conceptualization of information seeking may in fact be the last, most easily observable, perhaps not even primary stage of a complex set of activities—ongoing, conscious as well as unconscious, intentional as well as serendipitous, and social as well as political and cognitive. Borgman (2000, 7) argues that tasks are becoming more interdependent and their boundaries blurring. There are also many more information types and formats, sources, access points (virtual, temporal, and physical), and strategies. So it is increasingly difficult to identify and distinguish the components of information seeking, and less justifiable to define information seeking in a traditional way as consisting of the activities between the recognition of an information need and the acquisition of relevant information. Marchionini (1995) also sees “information seeking as a broader process rather than the more limited notion of information retrieval” (ix) and argues that “a variety of disciplinary perspectives are needed to advance our state of knowledge and to develop better systems” (x). Information seeking is “a process in which humans purposefully engage in order to change their state of knowledge” (5). It is much more general and dynamic than “information retrieval”; it overlaps with learning and problem solving in that its results may be stored for later use, but differs somewhat because the results may also be discarded after immediate use.

Further, this process not only involves “information” in the form of useful symbols stored and represented in some medium, but also “communication,” the exchange and creation of meaning through interaction among social actors via a variety of media ranging from face-to-face to hypermedia World Wide Web sites. As Buckland (1991b, 8) concurs, “Interpersonal communications and mass communications clearly ought to be within our scope”; he also notes that Mooers (1951) referred to information retrieval as “communication through time” (61). Because “organizations are societies of minds,” “information use for interpretation involves the social construction of reality, and information representation and delivery should support the multilevel interaction of social discourse” (Choo 1995, 1, 25). In line with cybernetic theory, information does not “flow through a system” but is the basis for “mutually constitutive interactions” (Hayles 1999, 11). Even the more formal manifestation of information—documents—“is embedded in ... communities and relationships” (Borgman 2000, 99), such as opinion leadership, invisible

colleges, citation and co-author relationships, journal and disciplinary norms, and so on.

Rather, accessing and browsing information and communication are highly consequential and multidimensional aspects of the information user's entire experience—often even including barriers to that experience. Indeed, we argue that general issues and processes of accessing and browsing information and communication are fundamental and very general human behaviors, not limited solely to the arena of seeking print or computer information. This book reviews literature from a wide range of disciplines on these two fundamental human activities to develop preliminary integrated frameworks for understanding accessing and browsing. Then, using multiple sources of evidence, these preliminary frameworks are evaluated, refined, and validated. The final result is an interdisciplinary approach to understanding two basic human behaviors, accessing and browsing, with respect to two basic human resources, information and communication. In line with recent developments in conceptualizing information seeking, we propose that the process of seeking information is a broad, pervasive aspect of human behavior and that a user-centered, interdisciplinary approach is required to fully understand it.

Studies of human information-seeking behavior in the fields of library studies and information science have long suffered from a lack of coherent theories because of narrow assumptions about information environments and information needs and uses (Chang 1993; Dervin 1980; Dervin and Nilan 1986; Durrance 1989; Johnson 1996; Katzer and Fletcher 1992; Roberts 1982; Wersig and Windel 1985; Wilson 1981). Roberts (1982) challenges the implicit assumptions of most user studies that information behavior is rationally motivated and organized, and that information activities only take place within recognizably artificial information environments such as the formal information system of a single organization. In the same vein, Katzer (1987) argues that in a world of information overload, limited time, and interpersonal pressures, it is difficult for us to achieve optimal rationality. This concept of bounded rationality corresponds to Simon's (1976) satisficing theory, which states that people tend to look for a course of action that is satisfactory, or good enough, rather than optimal. Thus, research in the area of user studies has become more focused on discovering the motivations, obstacles, contexts, and dimensions of people's information-seeking behavior and what uses they make of information in various settings.

This book extends these approaches by developing interdisciplinary frameworks for *accessing information and communication* (part I) and *browsing information*

*and communication* (part II), thus extending the scope of the information-seeking process.

## Accessing Information and Communication

### Defining the Parameters of Access

Access can be understood from the perspective of privileged, as well as excluded, access. In many cases, gaining access to information requires gaining access to relevant interpretations of a society, group, or organization (Geertz 1973). Membership in a community is recognized in different ways by different “tribes” (Taylor 1968). For example, insider stock trading cannot occur without “insiders” (and by implication, “outsiders”). In the context of technological systems, there are those with the necessary skills and access to the technologies, those with some skills and partial access, and those without. At a more basic level, there are those with the knowledge that such systems exist and those lacking that knowledge. Such divisions or distinctions have existed historically in the academic research tradition. For example, across academic disciplines, women have generally been treated as “other,” as deviant, as outside the norm (Simone de Beauvoir 1989, xxi). It has been in accordance with such standards that evaluation has been carried out.

In the context of information science, the “standard” human type might more saliently be described as elite. Historically, the development of information science as a field of research is rooted in the need to control and gain access to scientific information (Sparck Jones 1981), information that plays a role in a nation’s relative position of power in the world. In developing our field based on this perspective, we have focused on elites, on their needs, applications, and uses of information. In so doing, we have risked making access to pertinent information more difficult and less likely for nonelites, for a vast and perhaps majority population of “others.”

This unintentional limiting of access illustrates what Stuart Hall (1982) refers to as hegemonic power. A critical reading leads to an understanding that the power in this context lies not only in conscious decisions to control access. It lies primarily in the power to set and follow the terms of the debate, to define the parameters for form and content, to establish the framework for the very notion of what information can mean. Hall describes two groups of participants in the “struggle over access to the very means of signification”:

those accredited witnesses and spokesmen who had a privileged access, as of right, to the world of public discourse and whose statements carried the representativeness and authority which permitted them to establish the primary framework or terms of an argument;... and

those who had to struggle to gain access to the world of public discourse at all; whose “definitions” were always more partial, fragmentary and delegitimated; and who, when they did gain access, had to *perform with the established terms of the problematic in play*. (81; emphasis in original)

In the example of information science, the scientists, researchers, and corporate players are those with privileged access, those who determine the language in use, the questions asked. Others are left outside the arena of public discourse.

### **Barriers in Libraries and Information Science**

In a library setting we encounter hegemonic structures, barriers, and power systems. Insiders such as reference librarians or frequent system users, at the very least, understand the “rules of the game” (Taylor 1968) and have realistic expectations about what needs they might address through information. Others, outsiders, may never become users because the barriers to the inside—such as the necessary belief that access to a periodical article might be applicable to situations in their particular lives, or issues and situations that fall within the existing framework of citations and documents, or the required knowledge of a variety of formats and functions of computer technologies in order to retrieve the information—experiential barriers that inevitably leave a potential user feeling “stupid” and like an “outsider,” are too great to overcome. When “others” do gain access, they must perform within the established terms of the problematic in play (Hall 1982).

In particular, the boundaries around what constitutes the population of interest (concerning issues of access as well as users) to library and information science researchers have been drawn very narrowly. It is rare for user studies to account for those who never enter the inside, who never use a library or information system. Although Belkin (1978) points out difficulties in studying information in its most general sense, definitions of the discipline (Belkin and Robertson 1976; Wersig and Neveling 1975) do not necessarily rule out a broader theoretical understanding of what information means, nor do they rule out a consideration of “others” in addition to elites.

Given arguments that purchasing power will increasingly be the price of entry to the inside circle of participating citizens (Murdock and Golding 1989), that a complex of social and economic disadvantages becomes compounded over time, making entry into the world of elites less and less likely for the majority of the population (Gandy 1988), or that technology has increased tremendously the power of bureaucratic insiders relative to that of individual outsiders (Gandy 1989; Singer 1980), it is clear that the information-rich have *privileged* access to information. The

struggle to gain access for “others” requires that they learn and adapt to the framework of those with privileged access to the world of public discourse (Hall 1982).

An alternative perspective might view information systems as designed with the potential to address issues of access for those outsiders who, thus far, have carried out their lives beyond the scope of interest of research on information science. Given the potential implications of widely differential levels and types of access to information, from diverse research perspectives, it is time to expand our focus, to include “others” in our research, and to consider access issues and dimensions outside narrowly drawn boundaries of specific disciplines or professions.

### **Importance of Access as Focus of Research**

Historically, evaluation in information retrieval has focused on the effectiveness of a system (Robertson 1981), and “system” has traditionally implied a computer-based set of technology and software. Generally, this has meant how well a given system retrieves representations of documents (descriptors, citations, abstracts, text) in response to requests for information as represented by a query statement—usually referred to as relevance judgments (for example, Swanson 1965). Most such studies say nothing about the role of access in system evaluation. However, if a user is in a position to make a relevance judgment (Saracevic 1975), evaluate the utility of information (Cleverdon 1974; Cooper 1973a; 1973b), measure satisfaction (Auster and Lawton 1984; Tessier, Crouch, and Atherton 1977), or put information to use (Dervin 1983; Wilson and Streatfield 1977), several dimensions of access necessarily are already involved and have already been achieved. Implicit in the information-seeking process are dimensions of access, many of which occur or are addressed long before a user formulates (or finds herself unable to formulate) a query statement.

For several decades researchers have been aware that the quantity or quality of information available from a system is frequently less important to users than is the degree of ease with which they gain access to the information (Taylor 1968). Although researchers have begun to look at access to information systems (Culnan 1983; 1984; 1985; Gerstberger and Allen 1968; Hart and Rice 1991; Hiltz and Johnson 1989; O’Reilly 1982; Rice and Shook 1986; 1988), these studies have focused primarily on physical access to systems or access to other individuals through communication media. Other dimensions of access—for example, cognitive, affective, political, economic, and cultural—are also worthy of exploration.

We know very little about the potential dimensions of access or about users’ awareness or perceptions of such dimensions of access to information. Yet access to

information and communication affects many aspects of our lives, from economic well-being to privacy rights, from workplace management and monitoring to policy and decision making, and transnational business operations. With access underlying many different areas of everyday life, and implicit in much research, we need to understand its dimensions in order to consider seriously its implications. As we consider system design and evaluation, it is necessary to ask what the objectives are when these systems are employed in the individual's communication process (Budd 1987). Do we expect information systems to meet the needs only of those who already have access to such systems, or do we expect access to be open also to potential (currently non-) users? Is physical access sufficient, or are many other dimensions of access necessary, sufficient, or facilitative? In considering potential implications of increased access to information (for example privacy issues, or protection from corporate espionage or computer viruses), what are the pertinent dimensions? Such questions carry important implications for theory and method as well as for policy issues and freedom of information.

An explicit understanding of the dimensions of access, and of the access issues a user must address in the information-seeking process in any given situation, is likely to contribute to improved design, development, implementation, and evaluation of future information systems and services. Further, it may help inform policy debates about access to information and information systems in society by explicitly identifying previously implicit aspects of access and by describing interrelations among what are often seen as separate aspects of access.

Access is covered, or at least mentioned, in a variety of communication- and information-related literatures. Each vantage point illuminates access issues from a unique perspective. Every research literature, then, stands to be informed from new perspectives of other bodies of literature. Rice (1988) has noted the difficulty of integrating growing research on computer-mediated communication systems. The same difficulty lies in other areas of research that are by nature interdisciplinary. Certainly, the notion of access to information is interdisciplinary. An understanding of how the concept is treated in different research areas will contribute to a fuller understanding of access and its underlying dimensions. This, in turn, may contribute to integration of research across situations, disciplines, systems, and research processes.

### **Research Questions**

To develop a framework identifying the underlying dimensions of accessing information and communication, part I considers the following research questions:

1. What are the common issues and concerns implied by discussions of access-related issues in several relevant research areas (see chapter 3)?
2. What are the influences and constraints on access to information (see chapter 3)?
3. What are the assumptions and primary issues or foci of each research area that lead to the differences among them (see chapter 4)?

To test the framework, this study raises the following research questions:

4. How well does the framework capture/organize participants' perceptions of access to information across situations, individuals, and settings (see chapter 6)?
5. Do the study results suggest additional components or dimensions for the framework (see chapters 6 and 7)?

### **Browsing Information and Communication**

The ultimate goal of information systems and services has been to serve human needs for information and facilitate information-seeking and retrieval processes. To this end, much recent research has addressed the concern for better understanding of information seeking and application from the user's point of view (Dervin and Nilan 1986; Durrance 1989; Hewins 1990; Taylor 1991).

A commonly observed form of information seeking is browsing. Browsing has been observed and investigated in the context of information seeking in the library in general (Ayris 1986; Bates 1989; Ellis 1989; Hancock-Beaulieu 1990; Hyman 1972) and has increasingly assumed greater importance in human-machine interaction in particular (Belkin et al. 1987; Croft and Thompson 1987; Oddy 1977). Browsing as a concept and an activity appears to be a fundamental part of human behavior, which takes place in diverse contexts in daily life. People tend to follow "the principle of least effort" and may be constantly gathering, monitoring, and screening information around them as they go through daily life. Indeed, browsing has been conceived as a way to overcome information overload and is routinely employed as a screening and monitoring technique by many information system users (Baker 1986b; Hiltz and Turoff 1985).

The concept of browsing has both scientific and popular meanings, and appears in a wide variety of literatures, including library studies, consumer research, mass media studies, organizational communication, and information science. However, the concept appears rather infrequently, and is considered differently, in each literature. Previous browsing-related research has mostly focused on browsing as a search strategy rather than browsing per se, and has been limited to a specific



context (e.g., libraries) or information source (e.g., books or databases). A deeper appreciation of browsing as a fundamental behavior across various resources, situations, and contexts is needed. To the extent that browsing is a fundamental human information-seeking behavior, it appears to have scientific significance, though research about it seems still in a primitive stage. The concepts and nature of browsing have not been systematically studied and are thus not well understood. Because of this, there are at least five important issues or problems associated with research on browsing.

#### **A Common but Not Well Understood Phenomenon**

We all experience browsing to different degrees in various contexts in order to make sense of the world around us, such as when we read newspapers or go window shopping. We also browse to resolve an anomalous state of knowledge when we seek information in libraries or through computers. In its common use, *browsing* means to look through or glance at reading materials or goods for sale casually or randomly (Random House Dictionary 1987). The word *browsing* has been used by different groups of researchers often without a clear description or definition, or with specific but different meanings assigned to it. It has been construed as a search strategy in library studies and information science, a viewing pattern in media research, a screening technique in organization literature, and an entertaining activity in consumer research. All these different conceptualizations of browsing lead to the questions: What is the nature of browsing? and What are the underlying dimensions of browsing that allow us to understand those different yet related conceptualizations?

#### **Confusion between Browsing and Searching**

Because what constitutes browsing behavior and what characteristics are associated with it are not well understood, considerable confusion between the concepts of searching and browsing arises. For example, as Bates (1989) points out, in online databases, the term *browsing* is used in a very specific and limited sense, usually referring to reading short lists of alphabetically arranged subject terms or reading citations and their associated abstracts. On the other hand, in the library setting, there has been a tendency to see browsing as a casual, don't-know-what-to-do behavior, in contrast to directed searching. Herner (1970, 414) states that "much of what we call 'searching' is, upon dissection, primarily browsing. However, traditionally we tend to separate out searching when we think about browsing, placing

the search on a more rigorous plane. In doing so, we are probably deluding ourselves, and mean levels of browsing rather than searching versus browsing.” It has been suggested that a better conceptualization of information seeking or searching is the level of browsing involved. Yet we do not have good vocabularies to describe and discuss various forms or levels of browsing.

### **A Bias toward Specific, Direct Searching**

Although browsing is a prevalent form of human behavior, usually associated with library users as a means of searching for information, a tendency to emphasize and more highly value direct, precise searching as opposed to iterative, exploratory searching, such as browsing, has been common in library and information science literature (Greene 1977; Hancock-Beaulieu 1989; Hyman 1972). This bias is due partly to the fact that we do not know very well what motivates people to browse and partly to some unrealistic assumptions from researchers and librarians about users, their information needs, and the nature of information seeking. Until recently, these assumptions have been that users have static information needs, know exactly what they are looking for, and are output-oriented. Although some information-seeking situations are specific (e.g., item-searching behavior), in many cases users are in an anomalous state of knowledge (Belkin, Oddy, and Brooks 1982a; 1982b) and their needs for information are difficult to articulate in a verbal form (Taylor 1968) or they do not have predefined search criteria (Hildreth 1982). Their expression and interest in an information situation may change dynamically during the searching and browsing activities (Hildreth 1987a). Hildreth (1987a) notes that most end-users are not going after a specific known item, and that the process of searching (involving browsing) and discovery is more central to end-users’ searching objectives and satisfaction. Further, Stone (1982) supports that (at least for humanities scholars) the assumptions used in delegating searching to intermediaries—what is required is known and can be communicated—are not realistic. She suggests the importance of the humanist’s need to browse on the basis of the view that the search process itself is as important as the results.

As Bawden (1986) points out, “Although the importance of browsing is generally recognized, its nature appears to be little understood. . . . Little is known of the success rate of this sort of information seeking and still less of those factors which are likely to encourage it and make it more productive” (211). As browsing becomes a valid alternative search strategy (that is, it is no longer undervalued or associated with unskilled users), two important questions arise: What motivates people to browse? and What is the relationship of browsing to other types of information-

seeking behavior? Without a better understanding of browsing behavior, conceptualization of information-seeking behavior cannot be complete.

### **New Issues Raised by Information Technology**

Along with the proliferation of microcomputers, the emergence of diverse forms and contents of databases (including audiovisual materials), and continuing development of technology (e.g., hypermedia, the World Wide Web), browsing as an information search strategy has assumed a greater importance as end-user searching has become commonplace. Research has shown that there are significant differences in end-users' and intermediaries' information-seeking behaviors. Among others, they differ in their knowledge of mechanical (e.g., syntax) and conceptual (e.g., search logic) aspects of searching. Borgman (1986b) addressed this issue when she discussed the nature of the searching problem associated with most existing information systems that have been designed for direct searching that has been well-expressed in advance. This has made many end-user systems difficult to use because those systems demand previous training and a high cognitive load from users (Marchionini 1987). Browsing (in the sense of recognizing as opposed to specifying) is increasingly seen to be a valid alternative search strategy to keyword searching (Fox and Palay 1979; Oddy 1977). Moreover, perceived as a natural means of information seeking that requires no training and demands less cognitive load, browsing has been put forward as the most important form of searching for casual use (Tuori 1987) and for certain types of information (e.g., pictorial or audio databases) (Batley 1989).

As in many other aspects in life that are influenced by technology, these important differences and relations between browsing and other types of information-seeking behavior such as direct searching suggest different implications for system design. Indeed, many information systems have not succeeded because their designers failed to take into account various users' information requirements and behavior patterns (Antonoff 1989; Buckley and Long 1990; Shim and Mahoney 1991). Interactive systems of all sorts will need to support various search strategies, including browsing (Bates 1989; Ellis 1989). A prerequisite to such design is a better understanding of the influences on browsing, what functions browsing serves, and what the consequences of browsing may be.

Such understanding will also have implications for system evaluation. Traditional relevance-based evaluation criteria in information retrieval assumes that finding information is the goal of using an information system. As more applications and more diverse contents of databases become available to users for direct access,

databases are not only searched to find information but also browsed to learn about information or to gain general technology skills or even for intrinsic entertainment (such as “surfing the Web”). Thus, relevance judgments based on the final output may not be adequate. Research on browsing may have useful suggestions for such critical issues as how to account for such learning effects and how to devise appropriate criteria in evaluating a system’s support for browsing activities, or its “browsability.”

### **Research Questions**

Part II sets out to explore the phenomenon of browsing in an attempt to develop a coherent conceptual framework within which various interpretations and conceptualizations of browsing can be related. The purpose of this study is to provide a better analytical language for understanding important aspects of browsing as human information-seeking behavior. To develop a framework identifying the underlying dimensions of browsing for information and communication, part II considers the following research questions:

1. What is the nature of browsing?
2. Why do people engage in browsing?
3. What are the underlying dimensions of the browsing process?
4. What types of browsing exist?
5. What influences browsing?
6. What are the consequences of browsing?

### **General Approach**

Parts I and II are based upon two related research projects (Chang 1995 and Chang and Rice 1993; McCreddie 1997 and McCreddie and Rice 1999a and 1999b). Both were motivated and structured by a similar general method. Specifics of the methods are provided in their respective parts.

The general research method guiding both projects includes three basic steps: (1) developing—analyzing and synthesizing the research literatures of related areas to propose a preliminary framework; (2) testing—conducting a main case study to check the framework and content coding, revising the framework and content coding accordingly, and for the access framework only, conducting a follow-up case study to ensure theoretical variance; and (3) refining—evaluating and assessing the revised framework to arrive at a refined framework. Figure 1.1 summarizes this process.

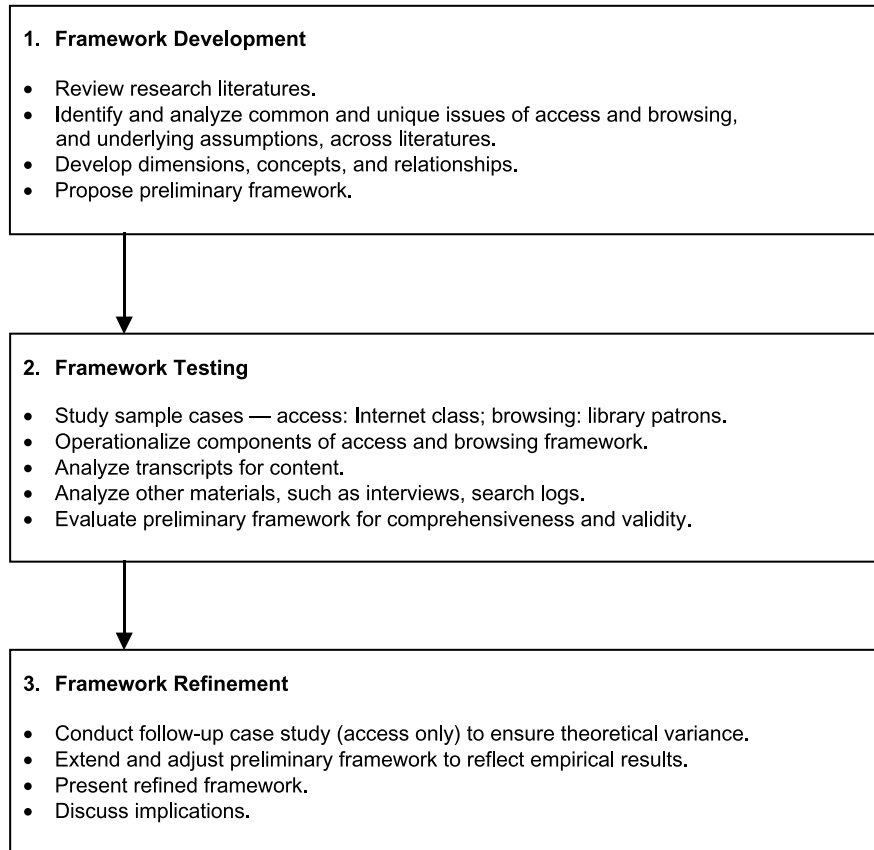


Figure 1.1  
Framework Development Process

### Framework Development

The first step was an extensive review and analysis of the literatures of several research areas. Allen's (1996) advocacy of a user-centered approach to designing information systems, Borgman's (2000) development of the global information infrastructure concept, and Choo's book (1995) on organizational scanning all take such an interdisciplinary approach. Literatures of the selected research areas represent a broad range of perspectives, increasing the likelihood of the developing theory's accounting for a wider range of characteristics. Concerning *access*, six literatures were reviewed: library studies, information science, "information society," mass communication, organizational communication, and economics of

information. Concerning *browsing*, six literatures were reviewed: library user studies, end-user computing and information science, consumer research, audience research, organizational research, and environmental planning and architectural design.

Divergent views were represented, including potentially conflicting perspectives, in order to account for as full an explanation as possible of the phenomenon under consideration and to expand the frame of thinking. Reconciliation of divergent views raises the theoretical level and generalizability of the results (Eisenhardt 1989). We identified candidate research areas most likely to cover the spectrum of related concerns and shed light on issues of access or browsing. For each research area, the focus on issues of access or browsing guided and limited the selection of which publications and books to include in the review process.

We note here that the particular designation of each research literature, and the materials that are reviewed as part of each literature, may well be questioned. For example, it might be more current to group library studies and information science into one category, or group them with “information society” and information economics, and even end-user computing and information systems, all in the recently labeled “social informatics.” Further, distinctions among some literatures are difficult to make, especially for those fields that are interdisciplinary in nature. For instance, there is an overlap between the library literature and information science literature in the treatment of computer applications such as online public access catalogs (OPACs). However, while the various common and unique perspectives and assumptions of each literature are interesting in themselves, that analysis is only a by-product of our general intention to survey as much relevant literature as possible in order to generate a comprehensive, interdisciplinary framework. Thus, particular regroupings of some of these research literatures would not change the essential framework. Still, we accept that some may disagree with our general groupings and labelings of the literatures and with what we list as unique perspectives in specific literatures.

While we tried to be comprehensive, it may well be that we missed some key publications, although we have tried to update our prior work to include the most recent relevant books. However, the reviews here are more complete within the traditional literatures of information science, library studies, and information society than any prior study of access or browsing, and we also apply concepts and results from literatures that are typically well outside these traditional areas, such as mass communication, consumer research, audience research, and environmental planning and architectural design. It may well be, though, that some other research literatures could provide additional concepts, dimensions, and results that would slightly alter

or expand our proposed frameworks. We invite the reader to explore these possibilities, and adapt and improve our initial attempts.

The next step was to create outlines of and notes on the publications, highlighting perspectives or comments on, and explanations or questions about, access or browsing. We then generated databases (one for access, one for browsing) of references and abstracts, capturing from the notes and outlines key treatments of access or browsing. The databases served as an organizing and analytical tool, allowing multiple runs at identifying and grouping categories, and seeking a balance between comprehensiveness and parsimony in working toward identifying theoretical propositions on which to build frameworks for understanding access and browsing information and communication.

#### **Framework Testing and Refinement**

The purpose of the framework testing stage was to compare the preliminary frameworks against the behavior and perceptions of real users addressing situations arising in their everyday lives. These were evaluated through in-depth case studies (involving observations, computer search logs, interviews, and surveys) to test the validity and scope of the particular framework and its theoretical propositions.

Testing the initial theoretical propositions (identified through the literature review) through case studies generates data that can either confirm the emergent propositions of the frameworks or provide the opportunity to revise or expand the frameworks, thus refining and extending the theory under development. According to Yin (1989), a case study approach is the preferred strategy when designing a study that aims to be explanatory, exploratory, or descriptive. He defines a case study as “an empirical enquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used” (23). The case study approach can provide description, test theory, or generate theory (Eisenhardt 1989).

This method allows testing of the theoretical framework and relies on replication logic (Yin 1989). First, the main case study may have revealed inadequacies in the preliminary framework, providing an opportunity for the investigator to refine both the theoretical framework and data collection plans. Cases may yield evidence confirming the theoretical propositions of the framework, thereby lending support for the validity of the framework. Cases may also yield evidence contradicting the propositions of the framework, thereby offering insight for refinement or extension of the theoretical framework.

### **Discussion of Implications**

Finally, each part presents its extended and refined interdisciplinary framework and discusses the implications and potential applications of the framework as well as limitations for future research. The results have the potential to contribute to the development of theories about communication and information, the choice of research and evaluation methods in studying information seeking and use, and the design and use of communication media and information systems. In addition, such a framework has the potential to inform policy issues and practice by clarifying dimensions of access or browsing that, from some perspectives and thus in various practices, have been omitted from consideration altogether, or by emphasizing aspects that have received attention from multiple research literatures.



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**Accessing Information and Communication**