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## Trends in analyzing access to information. Part II. Unique and integrating conceptualizations

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### Abstract

Part II summarizes and extends the review of fundamental conceptualizations of access to information across six relevant research literatures developed in part I. It identifies unique underlying assumptions of the concept 'access to information' within each of the different disciplines. We discuss implications of the conceptualizations of access, and of influences and constraints on access. We then integrate the common and unique conceptualizations and the implications to propose a general model of access to information. The goal of the two articles is to identify common and unique, as well as hidden and overlooked, aspects of how access is conceptualized in a selected set of relevant literature, and to suggest a comprehensive perspective that may be applied to future studies and policies related to information access. © 1999 Published by Elsevier Science Ltd. All rights reserved.

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### 1. Introduction

As part I argued (McCreadie & Rice, 1998), access to information affects our lives from economic well-being to privacy rights, from workplace management and monitoring to policy and decision making, and from daily errands to transnational business. Part I reviewed how six research literatures conceptualized access — library studies, information science, information society, mass media, organizational communication and economics of information.

Part II delves deeper into how these disciplines consider access to information, by identifying approaches unique to each discipline and by considering general implications of both the common and unique perspectives. Based on this multidisciplinary review and integration, it

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proposes a general framework for use in conceptualizing access to information that attempts to emphasize the common issues, note particularly relevant unique issues, and integrate the various perspectives. Such a framework has the potential to inform policy and practice by clarifying dimensions of access that, from some perspectives, have been omitted from consideration altogether, or by emphasizing aspects of access that have received attention from multiple disciplines.

## 2. Conclusions of cross-disciplinary review in part I

Table 1 summarizes the four major common issues or concerns that emerged from part I.

With respect to *conceptualizations of information*, issues receiving the greatest emphasis *within* disciplines were information as representation, and information as part of the

Table 1  
Common issues/concerns by research area

Issue/concern	Library studies	Information science	Information society	Mass media	Organizational communication	Economics of information
<i>Conceptualization of information</i>						
Resource/commodity				X	X	X
Data	X				X	X
Representation	XX	XX				
Comm process	X	X	X	X	X	
<i>Conceptualization of access</i>						
Knowledge	XX	XX	X	X		
Technology		X	XX	X	XX	
Communication	X	X	XX		X	
Control			X	XX	X	XX
Commodities				X		XX
Participation	X		X			X
<i>Facets of Information-Seeking Process</i>						
Context			X	X		XX
Situation	XX	XX				
Strategies	XX	XX			X	
Outcomes			X	X		X
<i>Influences/constraints</i>						
Physical	X	X	X		XX	
Cognitive	X	XX				
Affective					X	
Economic			X	X		XX
Social			XX	XX		X
Political			X	X		
Mediative	X	X	XX	XX	X	X

Key: XX means: issue is major concern or focus of research area. X means: issue is of some or implicit concern.

communication process, while those receiving the most attention *across* disciplines were information as a commodity/resource, and information as part of the communication process.

With respect to *conceptualizations of access to information*, issues receiving the greatest emphasis within disciplines were knowledge, technology, communication and control, while those receiving the most attention across disciplines were knowledge, technology, communication and control. Specific focus on access to participation is rare, except in the information society and to a small extent library studies literatures.

With respect to *facets of the information seeking process*, issues receiving the greatest emphasis within disciplines were the situation and the strategies stages, while those receiving the most attention across disciplines were the context, strategies and outcomes stages.

Finally, with respect to *influences and constraints*, issues receiving the greatest emphasis within disciplines were the physical, cognitive, economic and social aspects, while the aspect receiving the most attention across disciplines was the physical. Specific focus on affective influences or constraints was essentially nonexistent, except for a small coverage in the organizational communication literature.

We might say, then, that the general area of 'access to information' covers these four concerns and the associated issues within them. However, while each discipline covers at least one of the issues within each of the four major concerns, no discipline covers all the issues, even within one of the major concerns. Conversely, no issue receives treatment from all six of the disciplines and only a few issues receive either major attention within a discipline, or frequent attention across disciplines.

This means that each discipline or research literature overlooks or privileges certain issues associated with access to information, in different ways. This also means that only by taking a multidisciplinary approach to conceptualizing access are we likely to deal with all the apparently relevant aspects of access. One might look to those other disciplines that treat issues that are specifically overlooked within a particular discipline.

Thus it might be important to understand not only what is common across disciplines, but also what is unique or even implicitly assumed by specific disciplines. From these discussions, we consider what are some of the research and practice implications of the various perspectives for concerns about access to information, and about influences/constraints on that access. Finally, we attempt to integrate this vast review into a very general integrative framework.

### 3. Unique perspectives of the research areas

For each body of literature this section identifies some assumptions and primary foci about access to information that are obscured when only one research perspective, or only those issues common to multiple disciplines, are considered.

#### 3.1. Library Studies

The literature of library studies tends to view the issue of access to information from the perspective of the user, a shift from an earlier focus on the institution (library) or the information system (stacks or online catalogue). In general, the users studied are those seeking

print information in the setting of a library building, using subject headings or key words to represent the reality of the need for information. A further shift is moving the perspective toward understanding the information seeking process as movement through space and time in an attempt to make sense of one's world (Atwood & Dervin, 1982).

This focus on users carries its own limitations, however, particularly as it applies to an issue of significant concern in library studies—information democracy. The limitation is tied to the failure to account for the contexts, situations, and potential strategies of nonusers, and therefore for providing services appropriate to the needs of a broader segment of the population. For example, Chatman (1991) writes of working-class individuals seeking employment, who are likely to trust and attend only to interpersonal sources of information, not to written announcements. Further, scholarly or scientific publications will simply not include information about jobs for which this group is qualified. To account theoretically for factors involved in access to information, library studies needs to broaden thinking about who is seeking information, and what information means (Chatman, 1987; Harris & Dewdney, 1994) and the cultural and organizational contexts of information seeking (Durrance, 1988).

### *3.2. Information science*

In information science, research tends to focus on the nature of information itself (Belkin & Robertson, 1976; Belkin, 1978), and on how elite users go about seeking citations to and abstracts of highly technical or scientific documents (Bamford & Brownstein, 1986). In studies of the latter, the components of the information seeking process under consideration are generally limited to situation and strategies. In particular, the focus is generally limited to cognitive processes from query formulation through retrieval of a list of bibliographic references to print documents, although recent work emphasizes iterative evaluations and influences on subsequent actions of relevance information. Evaluation of the information search process is traditionally based principally on a narrow definition of relevance, derived from matching of query statement with citation.

This research area does attend to issues related to reducing or otherwise addressing 'anomalous states of knowledge' (Belkin, Oddy, & Brooks, 1982). However, as defined, an anomalous state of knowledge assumes far greater user understanding of his or her situation than is often the case among those facing challenges or questions in their everyday lives. The approach of this research area tends to be based on several assumptions: first, that a query statement is a reasonable representation of one's need for information and second, that the research area's narrow definition of relevance is an acceptable measure of performance. In addition, it assumes that access to a citation or bibliographic reference is an adequate representation of access to information, and that it is sufficient to account for cognitive processes as the primary source of influence or constraint on the information seeking process and on access to information.

Critics have suggested that those designing systems need more fully to explore human behavior to include influences in addition to the cognitive (Brown, 1986), in part, to help avoid unintentionally created barriers to access (Budd, 1987). Models of information retrieval need to account for differential access (Borgman, 1989) and differential levels of experience (Cuff, 1980; Kling, 1980; Daniels, 1986), as well as differential factors such as time pressures (Solomon,

1997a). Others suggest a need to account for the contexts within which a particular user encounters a situation and a need for information (Dervin & Nilan, 1986; Chatman, 1991) and, at the other end of the information seeking process, to account for the evaluation of information that is retrieved and used, especially as it may apply to gaps, challenges, needs, or questions encountered in everyday life (Belkin & Vickery, 1985; Chatman, 1987, 1991; Tague & Schultz, 1989).

### 3.3. *Information Society*

The literature on the information society and new technologies tends to view access to information as access to technologies, through which one can gain access to information, power or control. The focus is on the relationship of technology to human communication (Slack, 1984; Dordick, 1987) and commerce (Schement & Curtis, 1995; Wigand, Picot, & Reichwald, 1997) and related social issues such as information democracy (Doctor, 1992). This literature also addresses issues associated with the diffusion of innovations, including technologies that influence access to information (Rogers, 1986). In terms of the information seeking process, this perspective is more likely than others to account for the context and general outcomes of access to information, but not necessarily for the situation or strategies components.

This perspective tends to rely on a number of assumptions, including that society is experiencing a revolutionary transformation (Bell, 1973; Beniger, 1986). These assumptions raise issues of power and distribution of privilege in society, such as, for example, that class membership may determine the type of information to which one has access, and that information policy is a factor in determining the impact of new technologies on specific classes (Braman, 1989). In addition, technology tends to be viewed as a social phenomenon that shapes and is shaped by the host society (Doctor, 1991). Communication and technological competence (or the lack thereof) are related and compound with time and practice (or lack of them).

As is true of library studies, the focus of this perspective on information democracy assumes a commitment to equitable distribution of information and its benefits, as well as equitable distribution of the benefits of information age technology (Bourque & Warren, 1987; Doctor, 1991). There is a tendency to assume also that technology makes information available equally, plentifully and universally, and that technology can span space and time (Hudson, 1988; Kraut, 1989; Larose & Mettler, 1989) and, in so doing, expand access and information flow (Hiltz, 1986).

Critics assert that a mechanistic model prevails (Jansen, 1989) and argue against such a model of communication because it presents technologies as causal, rather than as social, phenomena (Slack, 1984). Some call instead for general cultural analyses of uses of technologies (Sproull, Kiesler, & Zubrow, 1984) or argue that the assumption that technology provides information equally, plentifully and universally, is misleading and irresponsible (Gillespie & Robins, 1989; Lievrouw, 1994).

### 3.4. Mass media

The literature of mass media that explores access to information is most strongly focused on the context of access to information, especially the context in which the information system operates and how those who control the system then set the cultural agenda or context for others. This view assumes that who controls the media influences what is produced and distributed (Compaine, 1985; Herman & Chomsky, 1988) and that the focus of inquiry belongs on the production and distribution of information (Coser, Kadushin, & Powell, 1982; Bagdikian, 1990). To some degree, this view also assumes some technological determinism (Innis, 1951; McLuhan & Fiore, 1967; Meyrowitz, 1985).

Others assume that hegemony is the explanation for cultural consensus building through the media (Gitlin, 1980). It is easy to oppose an argument that is part of the public agenda. It is far more difficult, however, to change the terms and logic of the debate, particularly without privileged access to establishing the terms in the first place (Hall, 1982). Further, there is concern that privatization of information, and the consequent narrowed range of access, threatens the rights of individuals (Schiller, 1981, 1989). An additional view assumes that taking the perspective of the audience member and how he or she makes use of information may change the understanding of the information provided through the media (Radway, 1984).

### 3.5. Organizational communication

Issues of access to information of concern in the literature of organizational communication tend to center on managing information; that is, on information flow and physical access to information systems or to information in the form of messages or data. Another major focus is on the selection and evaluation of media used in organizations to seek information and to exchange communication. Privacy and security issues and the influence of technology on the workplace and its functions, are also of concern.

Several assumptions tend to prevail with regard to access to information in organizational communication. The first is that given physical access to information systems or messages, access to information necessarily follows (Allen, 1969). A second assumption is that the environment and setting play a role in determining information behavior (Mick, Lindsey, & Callahan, 1980), including that interpersonal behavior depends on exposure of information about oneself to others and access to information about others due to relative spatial location (Archea, 1977). This view assumes each person to be at the center of a dynamic field of information behavior, continuously adjusting to the surrounding field.

One pervasive implication of these assumptions has been the emphasis on determinants of channel selection and the effect of that selection on effectiveness of information acquisition, decision-making, and communication performance. For example, the model of Saunders and Jones (1990) of use of sources and media during information acquisition and decision-making identified three main *decisional phases* (identification, development and selection) and various *components of information acquisition* (based on information richness, accessibility and internal/external criteria). Suggested interactions between these phases and components lead to six propositions, such as that new media are more likely to be used when decision makers are working on several priority decisions at once. The more familiar models of channel selection in

organizational settings — media richness, in its initial formulation — presume that media have relatively fixed characteristics (such as feedback and conveyance of nonverbal cues), that the extent to which those characteristics ‘match’ information processing requirements (such as uncertainty or equivocality of the task) influences outcomes, and that some people are more ‘media aware’ and can better match media with tasks (leading to higher performance and evaluations) (Daft & Lengel, 1986). Recent adaptations of channel selection theories include the symbolic value of the content as well as the channel itself, and situational constraints such as location and scheduling (Trevino, Daft, & Lengel, 1990). Extensions and alternative to this perspective include both more constructivist and more structural approaches (Rice & Gattiker, 1999).

Some assume that management styles drive applications of technology (Garson, 1988), and that technology can facilitate a panoptic relationship already of concern in issues of privacy, monitoring and security (Zuboff, 1988; Gandy, 1989; Botan & McCreadie, 1993). Tension between the assumptions that more information is better and that privacy issues are of concern is indicative of other tensions that arise in issues related to access to information, such as the tension between information democracy and privatization of information.

Some critics argue that an obsolete understanding of communication processes and power relations prevents our seeing the corporate domination of available information and processes of public decision making (Deetz, 1992). Others question any restriction of the flow of information in a democratic society (Allen, 1988) and are met by those who raise concerns about national security, privacy rights or worker alienation (US Congress, 1987). The assumption that access to information necessarily and causally follows from physical or system access has not been supported (Culnan, 1984), thereby strengthening the argument for investigating additional influences and constraints on access such as the relationship between perception of availability and use of a system (Culnan, 1983), the relationship between the ability to formulate a query and the perception of accessibility (Culnan, 1985) or the relationship between social considerations and access to information, particularly in an organizational setting (Solomon, 1997b). The assumption that more information is better has been challenged by the argument that the major problem for managers is not lack of data, but rather, reducing the equivocality in information in order to better focus one’s attention and to create a shared sense of meaning (Daft & Lengel, 1986).

### *3.6. Economics of information*

The primary foci with regard to access to information in the literature on economics of information include the free market and privatization, information democracy, considerations of cost, benefit, and value; and privacy and control (McCain, 1988). The notion of value is one that requires that we study the information seeking process through to the outcomes facet, in order to determine whether the user gains access to (can identify or create) the value of information in a given situation (Mulgan, 1991, p. 172). This perspective offers explicit considerations of the weighing of social as well as economic costs and benefits, which provides an important addition to understanding influences and constraints on access to information. A political perspective emphasizes more those of distribution of control capacities and the

availability of resources such as competence and time than of simple access to information (Mulgan, 1991).

Assumptions of this perspective are that information can be viewed as a commodity, but that information is unlike other goods and services (Arrow, 1979; Bates, 1988); that access to information is tied to the ability of the individual to participate fully as a citizen and the ability of the institution to succeed in the economic market; and that information carries with it the potential for public good (Hall, 1981). Some proponents of this perspective assume that when some goods and services (such as information) are necessary resources for citizenship activities, then political rights can become victim to the vicissitudes of the marketplace (Murdock & Golding, 1989; Schement & Curtis, 1995). Some critics see as untenable the notion of information as a commodity, rather than as part of the human communication process (Budd, 1987).

### 3.7. Summary

Table 2 summarizes these primary issues and assumptions identified by considering unique conceptualizations of access to information within each of the six research disciplines.

Table 2  
Unique perspectives of the research areas

Research area	Primary issues, foci	Underlying assumptions
Library studies	how users seek documents in library; information democracy	documents address questions of users; subject headings represent reality; bibliographic sources meet needs for information
Information science	elite users seeking citations to technical, scientific documents; nature of information	access to citation equals access to information; relevance as defined is acceptable measure of performance; ASK or query statement is reasonable representation of need for information; cognitive processes are sufficient focus of inquiry
Information society	relationship of technology to human communication; information democracy	society is experiencing a transformation that will change social structure; the relationship of technology to human behavior and societal context is appropriate focus of inquiry; technology can make information available equally, plentifully, and universally
Mass media	access to control over info production, distribution; cultural agenda setting	who owns and runs the media determines what is produced and disseminated; access to control over production and distribution is appropriate focus of inquiry
Organizational communication	information flow, privacy/security, physical access	physical access to information sources equals access to information; that more information is better/that issues of privacy are of concern
Economics of information	free market, privatization; information democracy; cost, benefit, value	information, if viewed as a commodity, operates differently from other goods and commodities; individuals require access to information to participate fully as a citizen

#### 4. Implications of conceptualizations of access to information

These various perspectives generate a host of implications for the different conceptualizations of access to information.

##### 4.1. Knowledge

Access to information as knowledge can lead to political power (Doctor, 1992; Gandy, 1993), to decision-making power (Gandy, 1988; Braman, 1989) and to citizenship activities (Gandy, 1988; Palmquist, 1992). It can also influence socio-economic opportunities (Braman, 1989; Doctor, 1992), including funds, legal advantage and equity. Further, such access can influence the quality of work life (US Congress, 1987; Zuboff, 1988; Palmquist, 1992) and, indeed, the quality of life in general.

##### 4.2. Technology

Technology raises a wide range of implications. Given the fundamental interest in information retrieval and communication systems in most of the research literatures and the rise in importance of Internet access, implications of technology (especially as mediation) are discussed in greater detail than for the other conceptualizations of access.

While technology is often an explicit issue of common concern across the research areas that interacts with access to information across the four facets of the information seeking process, the more general issue of mediation is often latent. *Mediation* occurs when our natural individual abilities to create, transmit, receive and process visual, auditory, olfactory, gustatory or tactile messages are extended, expanded or enhanced technologically by media or interpersonally by human intermediaries (Ruben, 1993). Mediation has the potential for two primary influences or constraints on access to information, namely, that it can *intensify* or *compensate* (Lievrout, 1994).

The intensifying potential of mediation operates when selected characteristics of the user or the system are intensified with use of mediation. Singer (1980) points out the potential for technology to accelerate or embed access difficulties already extant in an organization. Consider, for example, the claim that 'We *have* to do it that way, otherwise the computer can't handle it'. This exemplifies the intensification of one feature over another. Or consider an interoffice electronic mail system. When only text-based words can be exchanged, mediation intensifies difficulties of interacting, because facial expressions, body language, intonation, inflection and so on, are not exchanged. The bandwidth of information is constrained by mediation, thus diminishing access through intensification of one aspect of communication over others.

In the context of the workplace, others (Marx & Sherizen, 1986; Zuboff, 1988; Gandy, 1993) discuss the potential of technology to intensify surveillance capabilities. They argue that the panoptic potential (Botan & McCreddie, 1990) of communication and information technologies increases both the likelihood that surveillance will be carried out and the capability for matching of data from different sources to produce a new set of data that would not otherwise exist (Gandy, 1993). Because mediation makes possible the matching of data from, for example,

medical records with employment histories, this new set of data could lead to the exclusion of classes of individuals or groups from eligibility to participate in the workplace or in society.

Although the examples illustrate the intensifying of what might be considered negative characteristics, the negativity is a function of the perspective, rather than of the mediation, and the potential for intensifying positive characteristics is equally likely. For example, other possible outcomes of new sets of data are the ability to provide crucial services or avoid dangerous interactions among medical treatments. Access to technology can lead to an increased likelihood of monitoring or surveillance, but also to increased opportunities for interaction, flexibility and creativity, or to isolation and standardization (Kramarae, 1988). Intensifying can therefore also increase access to information, especially for the individual (Frenkel, 1989). As another example of the contextualization of mediation's influence on access, Schiller (1989) argues that technologies facilitate corporate control of culture. From the perspective of those with concerns for the rights of individuals, this may seem to indicate a danger. On the other hand, from the corporate perspective, this may be in keeping with a long-range marketing plan for providing new services to difficult-to-reach customers and may, indeed, appear very desirable to many stakeholders.

Access to technology can also lead to access to information about the system itself. As users gain access to information through technology, they also progress along a learning curve, gaining technological literacy such that subsequent interactions with technology grow progressively easier, more familiar and more accessible. Access to technology can thereby contribute to a compounding effect in that those who gain access are more likely to gain competence, experience and advantage in navigating systems and in gaining further access in the future, to technology, information and value, while those without access may find their deficit compounding over time.

Mediation and technology may also be viewed as *compensating* for potential limitations or barriers to access, spanning boundaries of time or space, or overcoming physical, social, cognitive or other constraints. Technology can cross boundaries of space and time that otherwise might block access to information. For example, technologies can increase the possibilities for access to information as was the case with the printing press or the telephone, or more recently, with the free access to the PEN project in Santa Monica (Rogers, Collins-Jarvis, & Schmitz, 1994) by all citizens, including Santa Monica's significant homeless population. The diversity of that city's population can gain greater access to a wide range of opportunities for information, communication, advocacy and the potential for participation in the political process.

Similarly, mediation can compensate for limitations in procedural knowledge of the user or for a system design that is less than transparent. Consider a typical visit to a library. Depending on the need and experience of the user, access to the information sought may require as little mediation as a few minutes with a technological interface and a glance at a conveniently located map of the building to find the location of the information source identified through the OPAC. It might be more complex, requiring a lengthy interview with the reference librarian, an extended search of several online databases with the librarian acting as intermediary, then again, with guidance from the librarian, directions to locating information sources available in the building, and additional guidance in filling out requests for interlibrary loans. Follow-up may be required for those items that are supposed to be on the shelf, but are

not, and for ideas on how to track down needed sources that are on loan. In other words, specific mediations can compensate for some limitations, but not for others. Following testing of a two-dimensional preliminary framework (McCreadie, 1998), mediation was added as a seventh influence/constraint on access. The synthesizing framework, below, reflects this addition.

Mediation and technology can compensate also for interpersonal or structural barriers to access to information. For example, in computer-mediated communication, individuals may overcome interpersonal barriers such as shyness to interact with others when they would be far less likely to do so face-to-face (Rice & Love, 1987); those with limited hearing gained greater access through telecommunications systems for the deaf and disabled (TDD service).

In an organizational context, upward communication is more likely, and horizontal or cross-boundary communication much more likely, through computer-mediated communication than in traditional, face-to-face contexts, because of physical and normative constraints on interaction. From the perspective of the mail room clerk, this may appear desirable, allowing conveyance of that brilliant idea to the head of the corporation, or requesting problem solutions from others throughout the organization. From the perspective of the CEO, however, the potential for information overload increases when anyone in the organization can send messages or forward documents electronically without regard for what at one time served as hierarchical constraints to access.

#### *4.3. Communication*

Access to information, when understood as access to communication, can lead to social and political equity or to imbalance. Within a social context, access to communication can contribute to a sense of community and to a means of maintaining or building community. In addition, it is the means of developing and cultivating social ties. Access in this context assumes communication competence and implies the compounding effect that communicative advantage or deficiency can impose on future access. Access to communication as making sense of one's world must account for access to information applicable to the everyday life and context of the individual and usable by that individual in a given situation. In the course of gaining access to communication, one can, perhaps through networking, increase the likelihood of gaining access to needed information in a timely fashion, possibly leading to the use of information as a control mechanism.

#### *4.4. Control*

The primary implication of access to control is that power, control, information and knowledge are all linked; indeed, that access to information is tantamount to access to control. Again, the compounding effect is seen as a factor in views of access to information as access to control. Those who are already advantaged are likely to benefit, perhaps at the expense of those less advantaged and current controls often limit potential new interpretations, uses and evaluations of information.

#### *4.5. Goods and commodities*

Consideration of access to information as a good or commodity generally is based on an assumption of an intentional, planned, rational search for information or an intentional, planned effort to control its distribution and availability. Information does not behave as do other commodities in the marketplace. Its value cannot be known until it is consumed, and it carries with it the potential for public good externalities and ancillary social value that are less likely to be considered in a privatized information market. The compounding effect carries with it the potential for reduced access due to the reinforcing of economic barriers by social dynamics, or to reduced benefits by limiting information to the possibilities associated with material goods.

#### *4.6. Participation*

The implications of issues that arise in considerations of access to participation include access to rights of participation as a citizen. Access to services, advocacy and interpretation increase the likelihood that one will gain access to full participation as a citizen. Limitation of access to participation, however, compounds factors that make access ever less likely. If information about one's rights is available through government agencies, but one has no access to those agencies because one is unaware of one's ability or right to participate, then access is socially impossible even if technically feasible. It is also impossible to provide feedback but remove the voice of the individual (Singer, 1980). Tensions are inherent between different perspectives on participation, such as privacy and security, or between different agents, such as individuals and institutions.

### **5. Implications of influences and constraints on access**

There is also a wide range of implications of the variety of influences and constraints on access to information.

#### *5.1. Physical*

Physical influences and constraints on access can alter the complex relations of power in technological development, information flow and how much one can have access to or how much one can make accessible (Archea, 1977; Gillespie & Robins, 1989). Physical accessibility can lead to the perception that information is readily available and that an information system is convenient to use. Such perceived accessibility increases the likelihood that the system will be used in the future (Culnan, 1983, 1984), but may easily lead to unrealistic expectations about other aspects of accessibility.

#### *5.2. Cognitive*

Cognitive influences and constraints on access to information reveal that, for access to occur, adequate matching between user and system is required on content and language, mental

models and expectations and information processing, learning and intelligence style. These requirements call into question a narrow definition of relevance which implies that access is gained when a query statement and a document title or citation match. If understanding, awareness, literacy and competence are required for one to gain access to information, it seems likely that only a small segment of the population is able adequately to understand all his or her information needs, to be aware of the possible and necessary means and the procedural knowledge to address it, and to express that need clearly enough to support the assumption that a query statement is a valid representation of the need for information. Rather, a more realistic understanding of relevance requires that it be evaluated according to how well a user is able to gain access to information that matches the context of the user, that meets the needs of the users' interdependencies with other people, that applies to the real-life situation from which the user's need for information arises, that satisfies the relevant criteria for problem resolution, and that meets the demands of the organization's internal and external environment (Taylor, 1996).

Information systems could be improved and access to information better understood if different intelligences were accounted for (Gardner, 1983), especially in designing access systems. If those who design, select, manage or implement information systems seek to provide broad access to information, then the work of developmental psychologists and cultural anthropologists underscores the need for sensitivity to individual and group differences in seeking to gain or provide access, as well as to attending to how people make sense of information as part of access.

### 5.3. *Affective*

Affective influences or constraints such as one's attitude toward one's capability, or attitude toward information seeking or computing, along with levels of confidence, fear, trust, comfort and discomfort, can have an impact on access to information. One's past experiences, along with level of familiarity with a given setting or situation, relative status, phase or facet of the information seeking process (Saunders & Jones, 1990; Kuhlthau, 1991) and resources lead one to feel more or less confident in seeking to gain access. Motivation level can balance affective constraints on access.

### 5.4. *Economic*

Economic influences and constraints on access to information can lead to control over what information is made available to others, and perceived as well as actual benefits, costs and value. It also has implications for issues of privatization and equity, as well as for censorship, copyright and surveillance. Economic influences and constraints can contribute to the compounding effect of reinforcing the link between socioeconomic class and informational class (Braman, 1989; Murdock & Golding, 1989), and of compounding the advantage of institutions over rights of the individual (Braman, 1989; Gandy, 1993). Economic influences and constraints can also contribute to a situation in which, if profitability is the prime motivation of information agencies, only those with economic resources will have access (Doctor, 1991).

At a slightly more abstract level, constraints on initial access to information serve to reduce the ability to transform (estimated or biased) prior probabilities into (more informed) posterior probabilities. In the context of evaluating information, then, costs associated with second-order (evaluative) information greatly reduce the access to subsequent first-order (substantive) information, so that those with less access to meta-information are likely to invest their efforts less well in deciding which first-order information (or, rather the distribution of information represented by a message or information service) to attempt to access (Hirschleifer & Riley, 1992, p. 179). From a probabilistic decision-making framework, this implies that higher costs for accessing prior probabilities (meta-information) reinforce a priori beliefs at the cost of a posteriori probabilities that may challenge those beliefs, so that any subsequent information is less likely to revise initial beliefs, generating lower value for any subsequent information (Hirschleifer & Riley, 1992, p. 184). We might argue, then, that constraints to access to general information (such as through education, which provides access to second-order information) generate considerable latent constraints and social costs in subsequent access stages.

Economic influences and constraints are tied to market forces, economies of scale, class membership and educational and social background. Such influences are tied, also, to policy development that seems to favor affluent institutions over the individual. In addition, economic influences can contribute to the potential for the consumer behavior of an individual to determine an individual's ability to participate as a citizen (Murdock & Golding, 1989). A natural tension operates between the tenets of information democracy and a free market, carrying with it significant implications for access to information.

### *5.5. Social*

Social influences and constraints can contribute to the compounding effect, reinforcing the link between socioeconomic class and informational class and influencing the degree to which one is able to participate as a citizen. Consequent advantage or disadvantage is similarly potentially compounded over time and can lead to a class privileged along multiple dimensions, and it can lead to an invisible social class of nonusers or outsiders. In addition, one's social environment affects how one makes sense of one's world, whether an individual is able to use access to information effectively and the structures within which information becomes meaningful and usable. Note, too, that higher access costs may be partially determined by individuals' and groups' characteristics, such as aversion to risk, cultural valuation of particular sources and media and motivations for seeking information (Chatman, 1991).

### *5.6. Political*

Through political influences and constraints on access to information, the potential to influence an individual's ability to exercise political rights and power, and to influence an individual's freedom of action, arises. In addition, as noted above, access to information carries implications for access to knowledge and, as such, access to a source of power. Such political influences and constraints are in turn influenced by the ability of the individual to understand and be understood, by resources available and by the social environment. Political

influences and constraints can also lead to selective prevention of access and to the creation of a class of invisible citizens with a weakened political voice (Gandy, 1993).

## 6. Framework for understanding access to information

Because each discipline has its own foci, theoretical concerns and methodological approaches, a comprehensive understanding of the concerns, influences and constraints and implications of access to information will come only from combining the insights, both common and unique, across multiple disciplines. Tables 1 and 2 showed that no discipline explicitly covers all of these issues and no issue is covered by all of the six disciplines. The present integration of reviews of six research literatures has identified several overlapping dimensions of the general concept of 'access to information'.

First, there are several *conceptualizations of information* itself (commodity or resource, data in the environment, representation of knowledge and part of the communication process). Each of these focuses on different aspects of information and makes different assumptions about the nature of participants, communication, content and meaning. Second, there are several *conceptualizations of the notion of access to information* that appear across various disciplines (knowledge, technology, communication, control, goods/commodities and participation). Each of these emphasizes different aspects of the access process (such as form of knowledge, technologies as mediators and economic value) and leads to different implications (concerning power, compounding effects, public and ancillary goods, democratic participation). Third, the research perspectives focus on different *facets of a general information seeking process* (context, situation, strategies and outcomes). This broader scheme substantially extends what is usually a limited concern with one or two components, necessarily overlooking other important factors in accessing information, from implicit design obstacles to assessing the value of retrieved information.

Fourth, various *influences and constraints* affect the nature and extent of access to information (physical, cognitive, affective, economic, social and political). Few system designs, institutional structures or research approaches, attend to all of these influences and constraints, making access a much more complicated and obscured endeavor for all participants. Implications vary from false assumptions about the relationship of system use to access, physical access to evaluation and compounding effects of competence and social networks. And fifth, each discipline operates under *unique assumptions and concepts* that can both highlight specific concerns not considered by other disciplines, as well as limit our understanding of access (ranging from the physical form of information, cognitive processes, industry control, and tensions between privacy and freedom).

Fig. 1 shows one slice of this multidimensional framework for understanding access to information, using the two dimensions that emphasize human behavior in the process of seeking to gain access to information: (1) the information seeking process (horizontal axis) and (2) influences and constraints on access to information (vertical axis). No hierarchical relationship is intended among the influences and constraints and, although context and situation generally precede strategies and outcomes in the components of the information seeking process, the process itself is neither linear nor sequential and is likely to be iterative. At

### Framework for Understanding Access to Information

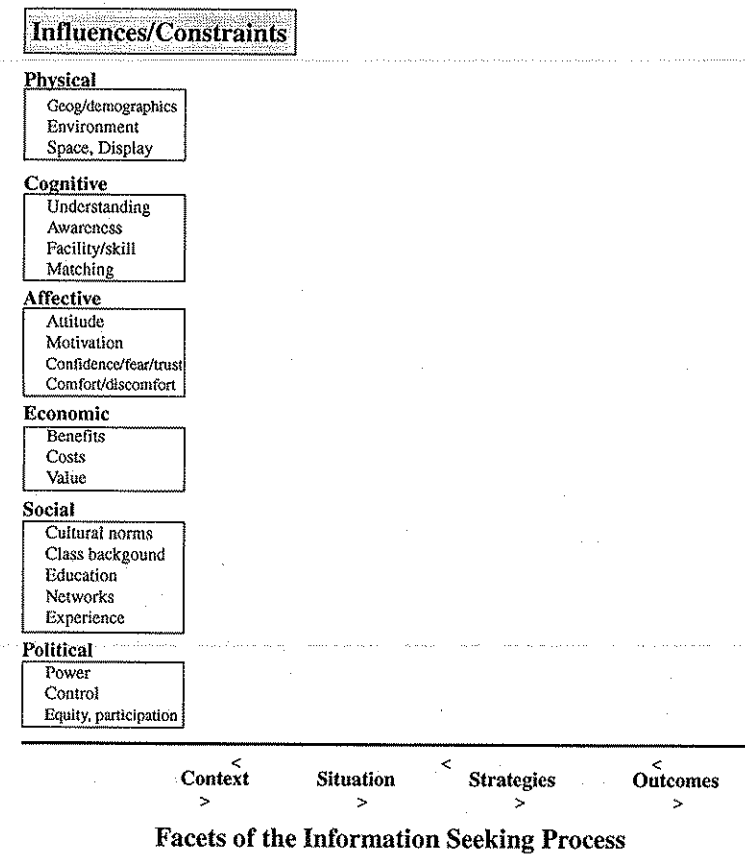


Fig. 1. Preliminary framework for understanding access to information.

any stage in the information seeking process, any of the influences or constraints may come into play. Other common issues and concerns identified in the literature can be considered once the two basic dimensions of the preliminary framework are clarified.

As the user seeks to gain access to information, he or she encounters influences and constraints on access that may be deeply embedded in the context. For example, in the context facet, social influences and constraints might contribute to the likelihood that a given individual generally operates in a milieu that views information and information systems as accessible, thereby influencing the user to see access to information in general as a viable possibility. In the situation facet, social influences and constraints might again contribute to the degree of familiarity of the same user with a particular set of circumstances and need for information. Social influences and constraints might, in the strategies facet, contribute to the likelihood of the individual's knowing the range of information sources available and how to navigate them. Finally, at the outcomes facet, social influences and constraints might contribute to the likelihood that the individual can make use of the information (i.e., understand and apply it) and gain access to the value of information retrieved or apply what is

found to revising the search strategies, reframing the question, reconfiguring the tentative understanding of the situation and returning to other components of the search process.

Testing of the two-dimensional framework (McCreadie, 1998) indicated that *mediation* acts as an influence or constraint on access. Therefore, in the synthesizing framework that follows, mediative represents a seventh category of the *influence/constraint* dimension. Fig. 2 portrays the multiple dimensions of access and their interrelations, within the limitations of a two-dimensional space (the printed page).

Placement indicates neither hierarchical nor linear relationships, but rather aims to indicate the role a given dimension plays relative to a continuum from theory and research, to practice, at which point the perspectives of various actors, such as patrons, service providers, researchers, policy makers, managers, system designers, distributors, creators, etc. (Taylor, 1996; Solomon, 1997c) come into play. In some ways, these 'access environments' are thus analogous to Taylor's 'information use environments'.

Conceptualizations of information, for example, appear near the top of the framework, because they tend to represent theoretical or research concerns in attempting to understand or explain access issues more than they apply in practice (represented at the bottom of the figure). These conceptualizations of information represent different perspectives on the nature of

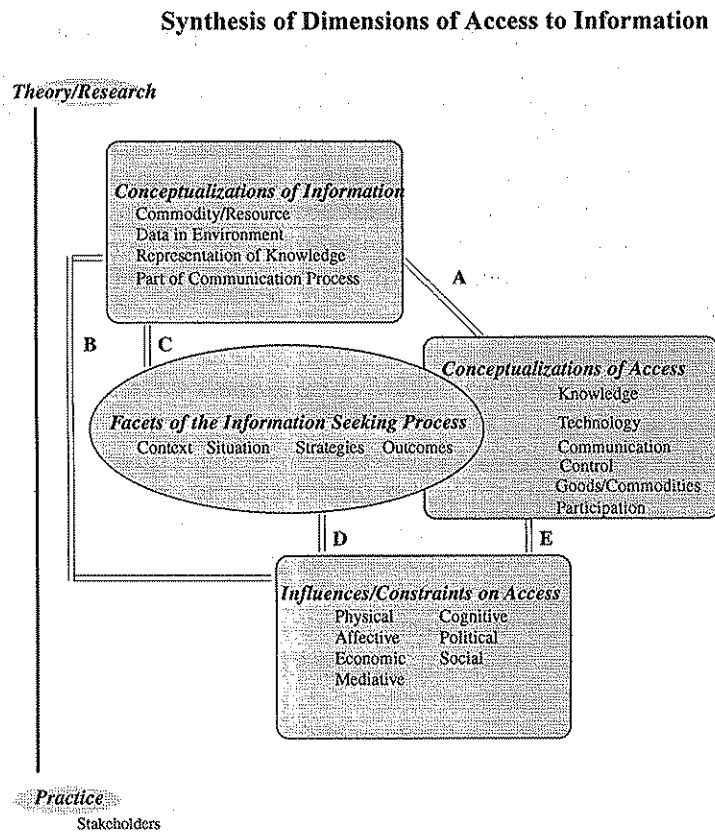


Fig. 2. Synthesis of dimensions of access to information.

information and are of differential interest in the research areas under consideration. For example, only library studies and information science focus on information as a representation of knowledge, but all save economics of information consider information as part of the communication process at least implicitly. A comprehensive model of access to information will account for both conceptualizations, contributing to the research process and a more comprehensive theoretical understanding.

Influences/constraints on access appear closer to the practice end of the theory/research ↔ practice continuum. This is because these influences and constraints on access are factors more likely to arise in the process of seeking to gain access to information than in theory development. Perspective comes into play when we think in terms of the views of the different practitioners. For example, a policy maker who had previously considered access issues only in economic terms might view the impact of policy on individuals differently if aware also of social or physical concerns. A service provider might select or implement a system differently if sensitive to affective and cognitive factors, than if focused exclusively on economic or technology factors. The following paragraphs briefly discuss each of the relations among the components in Fig. 2.

#### *6.1. Conceptualizations of information ↔ conceptualizations of access (A)*

Relationships between dimensions bear exploration. It seems likely, and consistent with analysis of how the research areas consider the categories of the dimensions, that how one conceptualizes information will correspond in some way with how one conceptualizes access to information (relationship A in Fig. 2). A research perspective that tends to view information as a commodity or resource, for example, is more likely also to conceptualize access to information as access to goods and commodities or access to control. By contrast, conceptualizing information as part of the communication process or as part of making sense of the world is more likely to coincide with a view of access to information as access to communication or access to participation.

#### *6.2. Conceptualizations of information ↔ influences/constraints on access (B)*

From a research or theory building perspective, how one conceptualizes information bears on which influences and constraints on access one attends to. For example, conceptualizing of information as data in the environment might lead one to be more aware of physical influences and constraints, such as those a work environment presents. This relationship, when viewed from the practice end of the continuum, suggests that someone dealing with cognitive concerns in designing a system is less likely to conceptualize information as a commodity or resource and more likely to think of it as a representation of knowledge.

#### *6.3. Conceptualizations of information ↔ facets of the information seeking process (C)*

If a researcher thinks of information as a commodity or resource, it makes sense that the focus of his or her inquiry will be on the larger economic context or on the direct outcomes of information seeking, such as number of retrievals, or as new interorganizational relationships.

A view of information as a representation of knowledge, on the other hand, will likely direct the focus to what the question is or how the user goes about finding the information. In other words, the emphasis will be on the situation and strategies facets of the information seeking process. At the practice end of the framework, the user is less likely explicitly to know how she thinks of information, but an understanding of the range of possibilities, based on the proposed framework, might well change the strategies she uses in the process.

#### *6.4. Facets of the information seeking process ↔ influences/constraints on access (D)*

An information seeker might well encounter different influences/constraints on access, depending on the facet of the information seeking process. For example, economic and social factors might be more salient in the context facet, affective in recognizing a situation, and mediative and cognitive in strategies, as the user addresses the situation. Similarly, this relationship (relationship D in Fig. 2) can vary according to the role of the actor in practice and the degree to which the practitioner can view other perspectives. For example, a service provider who is sensitive to a user's affective or physical constraints and views them as part of the context out of which the user's situation arises, might offer different mediative influences in discussion of the situation or in recommending strategies for the user.

#### *6.5. Facets of the information seeking process ↔ conceptualizations of access (overlap)*

This relationship is illustrated with overlapping dimensions, because how one views access, that to which one seeks to gain access, comes into play primarily in the strategies and outcomes facets of the information seeking process. Although the process is often cyclical and iterative, the context and situation of the user tend to exist prior to developing strategies or experiencing outcomes. If a user thinks of access as access to control, her strategies will likely differ from those of someone seeking access to technology, with the latter path more direct than the former.

#### *6.6. Conceptualizations of access ↔ influences/constraints on access (E)*

Here, again, there are natural connections between categories of the two dimensions, particularly from the practice end of the framework. One's role in practice allows a view of access that necessarily is partial and incomplete, and yet may be identifiably and significantly different than the view of another profession or role. An understanding of the varying perspectives expands understanding and also can contribute to improved access. An employee, for example, whose focus is on participation, but who understands that a manager's conceptualization of access might focus on control or on goods and commodities, is less likely to be constrained by social or political influences than one who had not considered other views. A system designer aware of different learning styles (cognitive), skilled at mediative techniques and who understands that users conceptualize of access differently, might well design a system more generally useful or more specifically tailored to a given user group than one who thinks that a user is a user and that access means the same to all.

## 7. Conclusion

This, of course, is the point. Access to information is a highly complex phenomenon, comprised of multiple dimensions, each with differential relationships to the others. Of the research areas studied, none considers all categories of all dimensions of access. By synthesizing the views of the research perspectives, we have identified dimensions and their components which have not been considered before as a whole. Further, when one considers the perspectives of the various actors in practice, it becomes clear that, although the view from one actor's perspective is necessarily limited, an actor can avoid creating or being stopped by unintentional barriers to access by considering the dimensions of this framework of access from the perspective of other actors. In this sense, the review, dimensions and proposed framework provide an initial vocabulary for discussing, analyzing and improving access to information. Perhaps a more comprehensive and consistent analytical and practical vocabulary will not only foster more programmatic and interrelated research, but also support more adaptable and widely accessible social and technological information systems, as well as empower practitioners and users to better identify their obstacles and goals with respect to information access.

The framework aims to identify a full range of factors involved in the information seeking process, emphasizing factors both common and unique across various disciplines. Potential uses of such a framework would be as a diagnostic evaluation approach for systems designers, implementers, managers and users. What issues seem to be most hidden, missing or underemphasized, in what particular information-seeking components? What issues attract the most attention from research and theory precisely because they are considered commonly across several disciplines? To what extent are theories of access comprehensive or biased in their coverage? Further, it may help inform policy debates both in and beyond libraries about access to information and information systems by explicitly identifying previously implicit aspects of access and describing inter-relations among what are often seen as separate aspects of access. The resulting framework can serve to sensitize future research to issues of access, with implications for those with privileged access, as well as for those struggling to gain access, to information.

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