European and other efforts. A major section concentrates on surveilling modern society and treats surveillance and social control as well as digital surveillance and privacy enhancement. In the section entitled The Digital Persona, Doty discusses the implications and problems associated with the digital persona one creates as he/she makes bank withdrawals, submits tax returns, applies for government benefits, uses email, places orders online, browses the Web, and carries out other electronic activities. Information entrepreneurialism and information capitalism also have positive and negative implications.

Major sections are devoted to: the public/private dichotomy; the concern that there may be too much privacy or an overemphasis on privacy and personal liberty at the expense of civic responsibility; gendered perspectives on privacy; privacy in public; and privacy as property (including the boundaries and weaknesses of property rights). Philip Doty concludes his chapter by rethinking privacy, scholarship, social critique, and policy making. He says "what remains is the work of inventing what we want society and digital communication to be [and] to help create the kind of society to which we aspire to belong."

1 The Concept of Situation in Information Science

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INTRODUCTION

This chapter reviews the theoretical and empirical literature on the concept of situation in information science (IS). Over the past decade, increasing attention has been given to this concept, often in connection with the related concept of context, in the IS literature. A common theme in this work is that in order to better understand information-seeking behavior (ISB) and information retrieval (IR) interaction, greater attention needs to be directed to the information spaces within which these activities are embedded. Closely related to developments in the cognitive viewpoint on information (BELKIN, 1990; INGWERSEN, 1996), conceptualizations of situation have evolved from early analyses of the individual-level knowledge states that precipitate information-seeking behavior to, more recently, the sociocognitive frameworks that explain a broader range of information interaction phenomena (see INGWERSEN (1999) for a recent review of the cognitive view in IR and JACOB & SHAW for a review of sociognitive perspectives). However, despite the seemingly widespread and growing attention to the importance of situation in IS, the concept itself remains ill defined and inconsistently applied. Thus, a review of the literature in this area seems both timely and important.

This is the first *ARIST* chapter devoted to the concept of situation in IS, although the topic has been given some attention in several earlier *ARIST* reviews. These include, in particular, the chapter by SCHAMBER (1994) on relevance, two chapters on the cognitive view in IR by ALLEN (1991) and INGWERSEN (1999), the review of social informatics by BISHOP & STAR, and the early *ARIST* review on information needs and uses by PAISLEY. This chapter attempts to extend, without dupli-

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cating, the discussions of situation in these earlier reviews. The goals are:

- To review and to evaluate critically the various conceptualizations of situation that have been applied to phenomena of interest to IS, including conceptualizations from areas outside IS; and
- To review the empirical studies within IS that have made situation a central object of analysis and to evaluate the usefulness of these projects with respect to their application to IS.

Scope

This chapter focuses explicitly on the analytic concept of situation and not more generally on that of context. Although these two concepts are often used interchangeably, an attempt is made to disambiguate them. The theoretical literature reviewed spans several disciplines, including sociology, psychology, anthropology, and communication. With respect to the time frame covered, most of the empirical investigations of situation reviewed here have taken place within the past decade; however, the theoretical writing on situation, across the disciplines covered, spans a wider time period.

Within the field of IS, the concept of situation has been investigated primarily in studies of information-seeking processes, information interaction, and IR behaviors. These general areas constitute the central focus here. Other areas in which the term situation is used, such as in situation semantics or situation logic (VAN RIJSBERGEN & LALMAS) to describe formal models of IR, are outside the scope of this chapter, as is the literature on social informatics (BISHOP & STAR).

Organization of the Chapter

The concept of situation has been a central unit of analysis in several disciplines related to IS, appearing in both the theoretical and empirical literature. Some of these conceptualizations have been adapted and used within the IS community to varying degrees, while others have not. This chapter first discusses briefly why we should care about situation at all in IS. Next, six theoretical perspectives on the concept of situation that are especially relevant to IS are presented, along with empirical applications. Within each section, the relative usefulness of different conceptual treatments of situation for understanding important phenomena of interest to IS is discussed.

BACKGROUND TO THE PROBLEM OF SITUATION

Situation, Context, and Interaction with Information

Terminology. Although the concept of situation appears with increasing frequency in the IS literature, the concept itself is neither new nor well defined. Scattered across the fields of sociology, communication, IS, and other areas are statements such as these:

- Every situation develops out of an environing matrix, a *situational field.* The major elements in this field . . . are people, culture, and physical nature (CARR, p. 45);
- *Situation* is a general term that refers to combinations of people, places, and events. For example, a stressful situation is one in which these factors combine to make participants feel uncomfortable. Similarly, an economic situation is one in which people, places, and events combine to create opportunities for profit and loss . . . . Using the same vocabulary, we can say that an *interviewing situation* is one in which people, places and events combine to create an opportunity for an interview to take place (SKOPEC, p. 10);
- Situation, in this research, means the moment in time-space as perceived by the respondent (HERT, 1997, p. 76); and
- Informational support is sought in situations when the actor does not have sufficient prior knowledge to accomplish his purposeful action (VAKKARI, 1999, p. 39).

It is clear from these varied conceptualizations of situation that there is no agreed-upon definition. Further, definitions vary across individual, social, and environment levels of analysis.

Context and situation. Conceptual understanding about situation becomes fuzzier when we take into account the related concept of context. Within the IS literature, it is not uncommon to come across the expression "context or situation" in studies of human information behavior. However, the use of situation and context interchangeably dilutes the explanatory power of each. Further, the conceptual murkiness surrounding these concepts has made it difficult to pursue methodologically rigorous investigation of either one. DERVIN (1997) refers to context as an "unruly beast" and discusses the problems of gaining methodological control over it. Situation is no less slippery. As VAKKARI (1997) states in his summary of the papers presented at the first International Conference on Information Seeking in Context (ISIC), "One of the

striking features in many studies was the use of the central concepts, like information, knowledge, information need, seeking, and use as primitive concepts, i.e., without definition. The terms situation and context were also most commonly used without taking much trouble in seeking their meaning" (p. 460).

Recently, attempts have been made in the IS literature to describe the conceptual differences between context and situation. SONNENWALD presents an evolving framework for understanding human information behavior, in which context and situation are treated as separate foundational concepts. In her framework, situations are characterized as being embedded within contexts. "A context is somehow larger than a situation and may consist of a variety of situations; different contexts may have different possible types of situations" (p. 180). Although this distinction is still a bit loose, we might extend it a bit to suggest that contexts are frameworks of meaning, and situations are the dynamic environments within which interpretive processes unfold, become ratified, change, and solidify. ALLEN & KIM take another stab at disambiguating context and situation: "The relationships between contexts, situations, and tasks are complex. We view contexts as the socially defined settings in which information users are found. One context might be a work setting such as an office or a factory .... Within each of these broad contexts, different situations occur. Or, to put it differently, individuals may be situated in different ways in the context" (ALLEN & KIM, p. 1).

Situation and interaction. There are several good reasons to care about making situation a central unit of analysis or, to use the terminology of VAKKARI (1999), unit variable. Over the past decade of theoretical and empirical development in the field, the concepts of context and situation have been brought into the foreground as IS has undergone putative paradigm shifts from system-oriented to user-centered and then to cognitive frameworks for understanding human information behavior (DERVIN & NILAN; INGWERSEN, 1996, 1999; SUGAR). (See PETTIGREW ET AL., this volume, for a review of this literature.) A further extension of the cognitive viewpoint in IS is the recent development of models that explicitly treat interaction with information as a central concern This can be seen in Belkin's episodic model of IR interaction (BELKIN, 1996), Saracevic's stratified model (SARACEVIC, 1996a), and Ingwersen's polyrepresentation model of cognitive IR interaction (INGWERSEN, 1996). With the development of interactive information systems and models of IR interaction behavior, focus has been directed to the situations within which these interactions take place. Indeed, the theoretical models presented by Belkin, Ingwersen, Saracevic, and others treat situation as one level of analysis. One way in which these concerns are being addressed is by focusing more attention on understanding the multiple situations within which information behaviors take place.

Within the cognitive and interactionist frameworks discussed above, the distinction between context and situation is meaningful. When people interact with information resources, an interaction situation is constructed, albeit within some context. To further the interactionist perspective in IS, we might quite usefully direct our attention to the constitutive elements of the interaction situation and the processes or dynamics through which human information behavior is regulated. These characteristics of situation cut across a variety of contexts and make situation a useful unit variable or central object of analysis in its own right. However, at this time IS does not have such a concept of situation that can help to advance the interactionist models in IR. Therefore, it seems appropriate to examine various conceptualizations of situation that might prove useful in this direction.

PERSPECTIVES ON THE CONCEPT OF SITUATION

Situation as an analytic construct has been treated in various theoretical ways that are of interest to IS. Six major treatments of situation form the basis of this review:

- The concept of problematic situation as first articulated in the phenomenological writings of SCHUTZ & LUCKMANN and later developed by WERSIG and by BELKIN (1980). In this theoretical treatment, situation is looked at as an individual-level internal cognitive state.
- Social interaction theory and its treatment of the definition of the situation. This perspective on the concept of situation moves away from the purely individual cognitive framework of the phenomenologists to view situation from a sociocognitive perspective, which attempts to understand the social basis of mind and ways in which meanings are constituted through interaction. Developed largely within the field of cognitive sociology and more recently applied to studies in IS, this perspective is strongly grounded in writings of sociologist GOFFMAN (1964; 1974).
- The Situated Action model. Developed by anthropologist SUCHMAN, this model attempts to explain human action, in particular human–machine communication, as an interactive process that is responsive and adaptive to elements in the technology use environment in contrast to the planned action model developed in cogni-

tive science. In this framework, Suchman argues that rather than strictly adhering to a predetermined plan, a person uses cues or elements in the interaction environment to determine action.

- The theory of Situation Awareness (SA) (ENDSLEY, 1990; 1995a; 1995b). Developed within the industrial psychology and engineering communities and related to human factors research, this theoretical perspective attempts to understand the cognitive processes, group dynamics, and communication behaviors through which individuals and team members develop and maintain correct and mutually ratified consensus about the state of affairs in complex, dynamic task environments involving interaction with information technology.
- Person-in-Situation model. As articulated by REID and discussed by SNOW and by PERVIN, this theory attempts to explain how human information processing and decision-making capabilities, along with other individual variables, interact with situational level variables on task performance.
- Situation as information environment. This is an ecological treatment of situation, focusing on the concrete environment of information use. Various types of situation ecologies may include: institutional, organizational, or work task settings; physical elements of the information resource environment; or situations of accessibility to information. The early work of TAYLOR (1991) represents an important starting point in the development of this perspective. A more recent example can be found in the work of ALGON (1997; 1999).

These six perspectives on situation can be further classified into three major overlapping categories representing cognitive, interactionist, and environmental or ecological perspectives.

THE PROBLEMATIC SITUATION

Schutz and Luckmann's Phenomenological Concept of Situation

In the phenomenology of SCHUTZ & LUCKMANN every person possesses a stock of knowledge that is sometimes insufficient for handling unknown aspects of situations that arise in everyday life. In this theoretical formulation, a distinction is made between routine and

problematic situations, the latter of which creates a cognitive state of uncertainty that may lead to information seeking to resolve the problematic state. In a problematic situation, people may experience events or information that are inconsistent with their common stock of knowledge, or they may find themselves lacking information necessary to attain some desired goal. When problematic situations are tied to goals, action tends to ensue. Characteristics of the particular goal state, or problematic situation, such as priority, timeliness, and attainability, influence information-seeking behavior.

SCHUTZ & LUCKMANN describe the various "provinces of meaning" within which an event can be framed. Some of these ideas are related to similar thinking by phenomenologically oriented sociologists, and the essays in LUCKMANN provide an early overview. The framing of experiences as a sociomental activity has been given explicit attention by BATESON, GOFFMAN (1974), and ZERUBAVEL.

The Problematic Situation in Information Science

Within the IS literature, early conceptualizations of situation focused on understanding individual-level psychological or cognitive states that act as precursors to information-seeking behavior. In noninteractive IR, the concept of situation first appeared in a 1979 article by WERSIG titled "The Problematic Situation as a Basic Concept of Information Science in the Framework of Social Sciences: A Reply to N. Belkin." For Wersig the problematic situation referred to an internal psychological state in which an individual recognized that his or her internal model about some aspect of the world was insufficient to accomplish a desired action or goal. This conceptualization of situation closely resembles the "visceral need" as a level in the information-seeking process as described by TAYLOR (1968), and the anomalous state of knowledge (ASK) model developed by BELKIN (1980). Belkin postulated that information-seeking behavior becomes instantiated when a person's conceptual state of knowledge about a particular topic is recognized as being insufficient with respect to the accomplishment of a desired goal. The ASK model and the Schutzian concept of problematic situation are closely related. Also related to these conceptualizations of situation as an individual, internal psychological state is the situation-gap-use model put forth by DERVIN (1983) and the uncertainty model proposed by KUHLTHAU (1993a; 1993b).

A common focus in this literature is on understanding precursors to information-seeking behaviors and processes of problem resolution. Unproblematic situations are those in which routine expectations about events in the everyday world are met and active information seeking is not needed as one passively monitors the environment (SAVOLAINEN).

As VAKKARI (1999) states, "The lack of understanding generates information actions for solving the problematic situation in order to proceed in the task. The major elements in the situation are actions to be supported by information, insufficient prior knowledge of the actor and informational support mechanisms" (p. 39).

An early and important contribution of the work by WERSIG and by BELKIN ET AL. (1983) and others was the understanding of people's problematic situations in terms of problem treatment rather than problem solving. The work by Belkin et al. was somewhat ahead of its time with respect to the recognition that a user's problem is not merely topical but needs to be understood within a wider situation of tasks and goals, which they felt were best elicited through interaction. In describing the problem treatment approach, they state: "the information provision mechanism interacts iteratively with the user, assisting him/her toward appropriate treatment of the problem by providing information which is appropriate in terms of the individual solution path and the characteristics of the problem situation" (BELKIN ET AL., 1983, p. 155). Another forward-thinking element of this research agenda was the use of simulated problem situations in the analysis of information provision mechanisms. This approach was used recently by BØRLUND, who investigated the validity of simulated task situations in the evaluation of interactive IR systems.

A common criticism of the early cognitive models of problematic situations is that they focus on individual-level cognitive states. These early cognitive perspectives on the concept of situation have received extensive coverage in the literature, and the reader is directed to recent extensive coverage in the literature, and the reader is directed to recent *ARIST* chapters by JACOB & SHAW and by INGWERSEN (1999) for further explication. The earliest conceptualizations of problematic situation did not generally encompass social interpretations into their frameworks. More recently, the phenomenological concept of problematic situation has been discussed within the context of interactive IR systems and the cognitive viewpoint. VAKKARI (1999) discusses problematic situations in terms of different cognitive states, which vary over phases or episodes. Each episode represents different situations of certainty or uncertainty, and within each episode are corresponding information-seeking behaviors or IR interactions along with different relevance judgment behaviors. Such a view is consistent with the recent model of multiple information-seeking episodes presented by LIN & BELKIN and in the research of SPINK and SPINK ET AL. on successive searching behavior and on partial relevance judgments. In the partial relevance model, it has been found that different assignments of relevance judgments are associated with different phases in the information problem situation. We can conceptualize each successive search state in the Spink et al. model as a different goal state, representing a

different type of problematic situation in the search process. WANG has also analyzed users' cognitive changes over time in the search process, or, in different stages of their problematic situations. In a similar vein, T. D. WILSON (1999) discusses his "uncertainty project" and, citing SCHUTZ & LUCKMANN, he states that "the basis for a model of describing successive searching processes is a problem and a problem is defined as a state of uncertainty" (p. 56).

While theoretically rich, the concept of the problematic situation and the phenomenological perspective of SCHUTZ & LUCKMANN in general have been given rather short attention in the IS literature. Few authors have explicitly invoked this phenomenological stance in their writings, even though the concept offers insights into the epistemic context within which information interactions take place. Perhaps one reason is the general perception that the definition of situation in this theoretical stance has historically referred to individual-level cognitive states, and, as noted by INGWERSEN (1999), the cognitive view has moved away from purely individual-level analyses to more holistic perspectives, taking into account social as well as individual explanations. However, the phenomenological perspective on situation does offer insight into social as well as individual-level phenomena when two other concepts discussed by Schutz and Luckmann are included in the analysis. These are typification and intersubjectivity. Typification, further discussed by BERGER & LUCKMANN, involves a process of sociomental classification, that is, a social shorthand method of mentally compartmentalizing persons, events, and things into socially agreed-upon categories. Intersubjectivity, discussed not only by Schutz and Luckmann but also by social interaction theorists discussed below, refers to a process of mutual understanding or common ground.

In an extensive analysis of the work of Schutz and Luckmann, NG ET AL. argue that taking these concepts together provides a framework of direct relevance to IS. The authors argue, somewhat incompletely, that the concepts of problematic situation, typification, and intersubjectivity can be used to bridge the gap between individual and social levels of analysis of information behavior in IS. The arguments are difficult to summarize in this brief space without presupposing a fairly thorough reading of the Schutz and Luckmann text on the part of the reader. However, those who are interested are directed to the manuscript by Ng et al.

In another recent attempt to apply phenomenological conceptualizations of situation to IS, LIN & BELKIN describe a theoretical model of information-seeking behavior, called multiple information-seeking episodes (MISE), which is solidly grounded in the phenomenological tradition of Schutz and Luckmann. In this framework, which closely resembles the successive searching model of SPINK,

information seekers are understood typically to engage in more than one information-seeking episode, each one characterized as a different type of problem situation. Lin and Belkin outline three properties related to the definition of the information problem situation: (1) level of domain knowledge; (2) complexity of the situation; and (3) degree of focus.

Relevance and problematic situation. The concept of relevance has a long tradition in IS, and in recent years the idea of situational relevance has been given wide attention, especially within the literature on the cognitive viewpoint in IR. First articulated by P. WILSON and further developed by SCHAMBER ET AL., SCHAMBER (1991; 1994), BARRY (1994), and BARRY & SCHAMBER, this body of work draws attention to dynamic, situational aspects of relevance judgments in IR interaction. The central importance of this theoretical contribution to IS is that it brought the concept of users' situations and intentions as goal states into consideration as a factor in nontopical relevance judgments. Although not explicitly grounded within the phenomenological tradition described above, the situational relevance perspective turns the problematic situation into a dynamic process by focusing on the interaction between situation and action. Taxonomies of user criteria for judging relevance with respect to some problem situation have been reported by BARRY (1993; 1994) and SCHAMBER (1991). Some of the situational criteria include depth and scope, currency, accuracy, novelty, and other factors directly related to the situation that has brought, or is currently keeping, a person in the information-seeking process. Other important work on cognitive approaches to relevance (BRUCE; FROEHLICH; PARK) is reported in a special issue of the *Journal of the American Society for Information Science (JASIS)* in April 1994.

Usefulness of the problematic situation perspective. The problematic situation was a centrally important concept in the early development of the cognitive view in IS. Its limitations have stemmed from a purely individual-level application to the study of important cognitive processes in information interactions, in which the emphasis was on problem in a topical sense and less on situation. An exception was the early work on distributed expert problem treatment reported by Belkin and his colleagues (BELKIN ET AL., 1983). More recently, however, the problematic situation has been reexamined from not only individual but also social levels of analysis within a variety of dynamic frameworks. For future research, an interesting and important question concerns the different types of problematic situations that arise in new interaction spaces, such as in digital libraries and the World Wide Web (WWW). A particularly interesting problem concerns how to represent problematic situations in IR system environments that rely on queries as representations of the information problem, in contrast to earlier

problem resolution spaces that relied on human intermediaries to help construct the situation. A particularly difficult problem for IR systems is that of how to understand and to represent the salient aspects of a person's problematic situation based on queries that are entered into the IR system. The simulated problem situation and simulated task situation reported by BELKIN ET AL. (1983) and more recently by BORLUND are useful approaches to this problem because they view problem situations as related to tasks and goals. An open question at this time is how to design IR mechanisms that will better support total problematic situation resolution.

COGNITIVE SOCIOLOGY AND SOCIAL INTERACTION THEORY

The Definition of the Situation

Somewhat related to the phenomenological conceptualization of the problematic situation is the social interaction perspective on the concept of situation that has long been a central unit of analysis among social interaction theorists, primarily those who can be described as cognitive sociologists. Cognitive sociologists are concerned with the social basis of mind or, as ZERUBAVEL describes it, the realm of the sociomental. Symbolic interactionism, in the tradition of MEAD, along with ethnomethodology as represented by the work of GARFINKEL, are central schools of thought here. An early overview of symbolic interactionism can be found in BLUMER. For this review, social interaction theory and symbolic interactionism are discussed together with respect to the ways in which situation has been conceptualized and investigated. According to this perspective, all human action, including interaction with inanimate objects, takes place within social situations. In every social situation there is a socially prescribed definition to which interactants are attuned and by which they are regulated. The constitutive elements of situation to which people are attuned are perceptions of self-competence, norms of interaction, communication conventions, and intersubjectivity between self and others.

The importance of investigating the interaction situation itself as a unit of analysis is stated nicely by sociologist GOFFMAN (1964), a seminal figure in social interaction theory, in a paper titled "The Neglected Situation": "Your social situation is not your country cousin. It can be argued that social situations, at least in our society, constitute a reality *sui generis* . . . and therefore need and warrant analysis in their own right, much like that accorded other basic forms of social organization. . . . So let us face what we have been offhand about: social situations. I would define a social situation as an environment of

mutual monitoring possibilities" (pp. 134, 135). From the perspective of social interaction theory, and in particular its variant, symbolic interactionism, people act according to both their definition of the situation and their perception of how they are being perceived or defined by others. A definition of a situation is the frame around an event that guides the interactions within it (GOFFMAN, 1974). When people enter into new or unfamiliar interaction environments, one of the first things they try to resolve is the question of how they should understand the event or what the appropriate definition of the situation is. "Presumably, a 'definition of the situation' is almost always to be found, but those who are in the situation ordinarily do not *create* this definition, even though their society often can be said to do so; ordinarily, all they do is to assess correctly what the situation ought to be for them and then act accordingly" (GOFFMAN, 1974, pp. 1-2).

Social interaction among strangers as well as among acquaintances is generally orderly and not chaotic because people have shared understandings about the definition of situation currently in play and, therefore, about the appropriate rules of conduct. These norms of appropriate behavior depend on the participation status of the interactants (GOFFMAN, 1961) or their social roles, rights, and responsibilities.

Social Interaction Theory and Information Science

Many of the questions raised in this literature are directly related to those now being asked in IS about the social vs. the purely individual environments within which information interactions take place (FROHMANN, 1994; HJØRLAND & ALBRECHSTEN; INGWERSEN, 1999). The concept of situation is centrally important in this literature; it is believed that within situations of social interaction, among humans as well as between people and IR systems, meanings are constituted and negotiated.

In recent work, AUDUNSON writes explicitly about the importance of attending to social norms in studies of information-seeking behavior. He writes, "Organizational action is to a large extent seen as symbolic and ceremonial" (p. 73), further observing that people in organizations act according to "codes of appropriateness." Audunson continues to explore the usefulness of social interaction theory when he stresses the importance of norms of information behavior as a variable in models of information-seeking processes. To cite one of his examples, in certain social situations, such as courtroom juries, there are clearly established norms about the sources one can trust as credible information. In other social situations, there are socially prescribed norms about whom one can ask for information and how.

From the perspective of social interaction theory we can suggest the following definition of situation: a situation is the set of regulative norms governing behaviors within broader contexts, made up of roles, and role sets, with prescribed norms. Situations are social constructions; they are typified in the sense in which BERGER & LUCKMANN use the concept. MANTOVANI & BOLZONI present a typology of social situations involving information technology; specifically they refer to vocational guidance systems.

Adopting a social situation view of information behavior provides researchers with multiple areas of investigation within IS and in a variety of information interaction environments. Directly applying Goffman's notion of the definition of the situation, MOKROS ET AL. studied interaction patterns between library users and intermediaries. They looked for interactional strategies that showed evidence that intermediaries had internalized a model of personhood with respect to the library patron and a model of professional identity with respect to their own role. Using a microanalytic technique involving the quantification of pronouns associated with power and inclusion that were uttered by the intermediary, they discovered that embedded within the interaction between user and intermediary one could find evidence of a definition of the situation that evolved from internalized models of professional practice and personhood. Using a similar analytic framework, COCKETT looked at the emergence of individual, group, and social identities among librarians as constituted through interaction during a work-group situation. In particular, she examined the utility of the concept of personhood for understanding the dynamics of group interaction in collaborative decision-making situations. Recalling social interaction theory, personhood refers to an individual's beliefs about self, other, and the social world. Her research adopts a constitutive theory of communication, in which the multifunctionality of language is recognized and in which realities (including identities) are thought to exist not prior to but in moments of communication. A case study of one decision-making meeting forms the basis of this work, which examines the personhood orientations from which the individuals approach the situation.

The work reported by Cockett is closely related to other social interactional analyses of user–intermediary interactions, a slightly different work situation but one in which the value of social interaction theory can well be appreciated. CHELTON uses this framework in her study of the interaction between a school library clerk and an adolescent patron. Drawing on the theoretical writing of Goffman, she discusses the interactional strategies through which institutional power and control are maintained in this situation.

Within IS, an important issue at this time is how to apply social interaction conceptualizations of situation to contexts of IR interac-

tion—that is, within situations in which users interact directly with inanimate information objects and systems.

IIVONEN & SONNENWALD have investigated some of the communication aspects of IR interaction by analyzing the search term selection process of professional searchers. They invoke a model in which shared communication conventions, or what they term the "navigation of different discourses," is a key decision-making element in the selection of search terms. "The results of our research suggest that when searchers select search terms to describe a certain search topic, they may step through various discourses in which this topic may be discussed and conceptualized differently" (IIVONEN & SONNENWALD, p. 313). The six discourses that were traversed by the searchers in their study are: (1) controlled vocabulary, (2) document, (3) indexing practice, (4) clients' search request, (5) database, and (6) searcher's previous searching experience.

In another example of directly applying social interaction theory to the study of IR interaction, COOL (1997a; 1997b) developed a model of user–system interaction that she labels situation assessment. Situation assessment is described as an inferential process through which people make sense of various dimensions of the IR interaction as a social interaction situation. Earlier COOL (1993) argues that IR can be construed as symbolic interaction between users and authors of texts through the mechanisms of the IR system.

Five dimensions of situation assessment were investigated by COOL (1997a; 1997b): assessment of (1) self-competence, (2) communication conventions, (3) appropriate norms of user–system interaction, (4) intersubjectivity, and (5) document topical relevance. An experiment was conducted in which subjects conducted searches on the same task and were asked to think-aloud during the interaction session. Verbal protocols were coded for the presence of situation assessment expressions.

A major finding was that expressions related to social interaction dimensions of the IR session outnumbered those related to topical relevance. Further, the greater the frequency of situation assessment expressed by subjects, the less well they performed the task, which was to find and to save as many good documents on a specified topic as they could. COOL (1997a; 1997b) concludes that the social interaction framework is useful for further understanding of IR interaction and that future work needs to explore the relationship between situation assessment and IR performance. She also argues for further research into the processes through which intersubjectivity—or mutual understandings between user and IR systems—is created and maintained.

Usefulness of the social interaction perspective. These studies, along with the theoretical literature cited above, argue strongly for taking into account the social interaction perspective of information seeking and IR interaction situations. With the development of interaction-based models of IR, the concept of situation that emerges from social interaction theory seems to provide an especially rich perspective on the nature of the communication strategies and communication goals that people bring to the IR experience. Within any situation of social interaction, participants orient themselves to the prevailing definition of the situation, the participation status of others present, and the appropriate norms of interaction, including communication and language. Within the social interaction literature, especially symbolic interactionism, the central concept of intersubjectivity seems to hold strong potential for development in future studies of IR interaction. If we view IR interaction as a process of communication between authors of texts and people for whom those texts might be useful, then an important problem for the user interacting with systems that provide access to unknown collections of information objects, such as are found in digital libraries and on the WWW, is the problem of calibrating the degree of intersubjective alliance between oneself and the creators of information items. The task for future research in IS will be to investigate the problematic situations further (in terms of tasks and communication goals) that people bring with them to the IR situation and to find ways to support them in future system environments.

THE CONCEPT OF SITUATED ACTION

The concept of situated action appears primarily in the human–computer interaction (HCI) literature, and focuses somewhat narrowly on behaviors within the information technology use environment. This framework was developed by SUCHMAN, an anthropologist, who locates her work within the ethnomethodological tradition, especially the earlier work of GARFINKEL. Describing situated action as closer to a program of research than an actual theory, Suchman defines the concept as follows: "That term underscores the view that every course of action depends in essential ways upon its material and social circumstances. Rather than attempting to abstract action away from its circumstances and represent it as a rational plan, the approach is to study how people use their circumstances to achieve intelligent action" (SUCHMAN, p. 50).

Viewing HCI as a process of communication, Suchman shares some of the theoretical perspectives of the social interactionists described above. The motivation behind the development of the situated action model is a challenge to the cognitivist planned-action approach, which views human action as rational, purposeful, and planned. While not denying the existence of plans in people's interactions with computers

and other inanimate objects, Suchman argues that what appears to be planned action is in fact the result of cooperative action and shared meanings built up during the context of the interaction. The significance of Suchman's model for understanding IR interaction is that it provides a bottom-up approach to understanding situation from a process perspective.

The notion of situated action is related to the symbolic interactionist view that meanings are built up within situations of interaction. Suchman makes a connection between her model and the ethnomethodological approach articulated earlier by GARFINKEL with respect to how people infer meanings within their situations. Ethnomethodologist Garfinkel developed a notion of how people routinely understand the situations they are in, which he terms the documentary method of interpretation. According to Garfinkel, people typically build up and reformulate their understandings of the larger social situation, or context, by using multiple sources of evidence available to them in the environment. Using a part-whole method of analysis, people begin with some idea of the situation, then they use each new appearance of information as evidence for confirmation or modification of their belief. The documentary method described by Garfinkel seems to be close to what BATES describes as berry-picking during information-seeking episodes and is also consistent with Kuhlthau's characterization of information-seeking behavior as an unfolding process of seeking meaning and of uncertainty reduction (KUHLTHAU, 1993a; 1993b).

Situated Action in Studies of IR Interaction

The concept of situated action has found greater acceptance in the field of computer-supported collaborative work (CSCW) than it has in IS directly, although there have been several applications of interest to IS. Within IR, the concept of situated action has been explicitly addressed by HERT (1995; 1996; 1997). In this program of research, Hert was interested in studying the nature of people's information-seeking goals within the context of their interactions with IR systems. She studied OPAC users, beginning with an analysis of the initial user goals that brought people to the library. Results of her in-depth qualitative analysis revealed that users' goals were relatively unchanging, but behaviors varied according to situational elements in the information environment that were related to the goal. Hert did not begin her investigation with the intention of using SUCHMAN's model of situated action, but as her results unfolded, she adopted the framework to explain changes in user behaviors. She states: "An OPAC interaction is a series of situated actions on the part of the user. By situatedness is

meant that as a user moves through an interaction, his or her actions are not completely predetermined, instead elements of the situation are utilized to influence action" (HERT, 1996, p. 507). In other recent work in this area, XIE (1997; 1998; 2000) has investigated the issue of planned vs. situated aspects of IR behaviors. In an analysis of library users' goals and intentions over the course of searching episodes in the library, Xie discovered that the concept of goal is much more multidimensional than had previously been conceptualized. Users were found to have a hierarchy of goals. High-level goals brought them to the library in the first place, but over the course of interaction with information items, a variety of microlevel goals, which Xie calls interactive intentions were observed. A number of interactive shifts, representing changes in the microlevel interactive intentions, were observed as a result of interaction with information and other situational elements. Xie further discusses the information-seeking strategies associated with shifts in interactive intentions, and a major conclusion of her study is that the planned vs. situated action models presents a false debate. Both dynamics are present in interactive information environments.

Usefulness of the situated action model. The situated action model addresses a number of important questions related to information interactions that are directly relevant to a better understanding of interactive IR. A weakness in this perspective on situation is that there is no specification of the ways in which interactions are situated, what the situating elements of different information interaction environments are, and the extent to which the situated action model offers concrete guidelines for the design of more supportive information interaction environments.

THE THEORY OF SITUATION AWARENESS

Developed within the industrial engineering and human factors community, situation awareness (SA) is a theoretical model that attempts to explain the processes central to performance and decision making in dynamic and complex environments, such as military operations, aircraft navigation, surgical teamwork, and other environments where technological decision making occurs. Extensions of the concept have appeared recently in the IS literature (SONNENWALD & PIERCE).

The concept of SA was first developed to account for military performance, especially aircraft pilot navigation, and much of the early work focused on pilot errors that were traceable to inadequate awareness of or attention to elements in the cockpit environment that signal flight and operating conditions. While the earliest literature on SA appeared in the military context during the 1980s (see CASTELLAN for an over-

view), it has since been applied to other civilian environments, such as operating-room situations (GABA ET AL.) and fire-fighting situations (ARTMAN). Later developments in this literature have focused on group as well as individual-level situation awareness.

ENDSLEY (1990; 1995a; 1995b) has been instrumental in developing a coherent theory of SA, distinguishing it from ordinary human processing. Her definition has since been adopted and used extensively in the human factors community: "True SA, it will be shown, involves far more than mere being aware of numerous pieces of data. It also requires a much more advanced level of situation understanding and a projection of future systems states in light of the operator's pertinent goals. As such, SA presents a level of focus that goes beyond traditional information-processing approaches in attempting to explain human behavior in operating complex systems" (ENDSLEY, 1995b, p. 32). ENDSLEY (1995a) further discusses some of the factors that appear to influence the SA process. They include individual abilities, in terms of perceptual capabilities, along with system design and interface features. In her process model of SA, Endsley (1995a) further proposes three levels: level 1, which involves perception of the elements in the environment; level 2, which is the comprehension of the current situation; and level 3, which is a projection of future status.

Dimensions of Situation Awareness

Mental models of the situation. ENDSLEY (1995b) discusses mental models, or schemata, to describe one element of SA. She invokes the related concept of situational model (p. 43), which she borrows from VAN DIJK & KINTSCH, to describe a mental representation of the current state of the system model, including the projected future state of affairs. The ability of people to process large amounts of information in complex decision-making environments depends on the prototypical situations or scenarios that are stored in memory. The ideas about shared situational models and the mental categorization of types of situations are somewhat related to earlier frameworks discussed above, most notably in the phenomenology of SCHUTZ & LUCKMANN and the symbolic interactionism of BERGER & LUCKMANN and MEAD. CANNON-BOWERS ET AL. recognize that ideas about the existence and the importance of shared mental models in cooperative activity go way back. "As early as 1934, Mead maintained that 'complex cooperative activity' is only possible if each team member can direct his or her behavior according to shared notions of task processes and activities" (CANNON-BOWERS ET AL., p. 228).

Group situation awareness. SA and situation assessment have been looked at in individual-level and group- or team-level activity. The importance of group SA and shared situational models in team decision making is discussed by CANNON-BOWERS ET AL. and by WELLENS. Cannon-Bowers et al. provide a good overview of the literature on mental models in general and then explicitly on shared mental models in collaborative activity. A shared mental model in this literature is one in which there is a common model of the situation or problem or multilevel group SA. Wellens highlights the problem of facilitating group SA in geographically distributed work teams. Further developments of the SA model have turned to an analysis of the group or work team as the unit of analysis and to the processes of maintaining intra- and intergroup awareness in collaborative decision-making environments (ARTMAN; ENDSLEY ET AL.; JENTSCH ET AL.; SALAS ET AL.; STOUT ET AL.). The investigation by JENTSCH ET AL. focuses on the increased complexity that accompanies team-level SA, and they cast their discussion within a communication framework. "Intrateam communication, for example, has been identified as one determinant of team SA" (p. 1).

The effect of distributed information architectures and communication patterns on SA and cooperation in dynamic decision-making environments has received attention from ARTMAN and SALAS ET AL. Artman's study explicitly addressed the question of the relative effectiveness of different conditions of information flow in a simulated fire-fighting task. Artman found that the more successful team engaged in more frequent message exchanges, particularly, more cross checking with respect to establishing mutually held understandings of the situation. With respect to specific channels of communication, the most successful teams had commanders who engaged in frequent verbal interaction rather than relying on email.

We see in Artman's study and also in work by CANNON-BOWERS ET AL., SALAS ET AL., and STOUT ET AL. the importance of situational models in the coordination of efforts among members of work teams, the evaluation of the difference between individually constructed and consensually shared models of the situation on task performance, the information needs of team members, and the communication strategies that might most effectively support it.

Situation Awareness Theory and Information Science

Attention to SA as a theoretical concept has only recently begun to appear in the IS literature. In a recent study of communication and information behavior among military team members in command and control environments, SONNENWALD & PIERCE discuss the social situational requirements for effective performance in that particular dynamic task environment. A central variable in their discussion is

shared team awareness, which they describe as a multileveled process of interwoven situational awareness, consisting of individual, intragroup, and intergroup shared understandings of the situation. This particular framework combines elements of group SA theory along with social interaction theory as discussed above. Some correspondence between the work in SA and IS can be seen in the work of BELKIN ET AL. (1983) and to a lesser extent, in the work of COOL (1997a; 1997b) on situation assessment.

Usefulness of situation awareness. Since being introduced, the concept of situation awareness has been expanded to include both individual cognitive processes and group or team awareness in collaborative environments. SARTER & WOODS (1991; 1995) have argued that the concept is so nebulous as to be almost meaningless. Despite this conceptual looseness, a consistent body of work has been developed, much of it relevant to IS. The literature on SA, while developed within industrial engineering and human factors, addresses many concerns of relevance to information interaction behavior, especially at the point of interaction between users and system interface features and functionalities. The attention to individual-level awareness of control mechanisms in dynamic interaction environments, such as aircraft cockpits, has some relevance to IS with respect to the design of usable, understandable interface features and functionalities, particularly those that use visualization techniques as modes of presentation.

SA theory also has some direct relevance to issues of navigation in IR systems. For some time now there has been a concern with understanding how users navigate through complex physical information interaction spaces (CANTER ET AL.). Problems of wayfinding in physical and other spaces (BUTLER ET AL.) is another related area in which the concept of SA might offer some insights. UTTING & YANKELOVICH, in an earlier piece, describe the problems of disorientation in hypermedia systems. Certainly the design of multifunctional interfaces to facilitate interactive IR, especially in new information environments, places cognitive burdens on users that may be framed within the concept of SA.

The importance of collaboration, cooperation, and shared mental models of the situation are discussed in the SA literature, along with ways in which these processes can be facilitated through interaction (ARTMAN; ENDSLEY ET AL.; JENTSCH ET AL.; SALAS ET AL.; STOUT ET AL.). All of these concerns are of interest to IS and information retrieval. The study mentioned earlier by Sonnenwald and Pierce is relevant to and contributes to this body of literature. The earlier work on distributed expert problem solving by Belkin et al. (1983) relates to similar problems, especially those of communication mode and control structure.

Future work in interactive IR might well benefit from a more thorough look at SA theory. Although the concept appears in literatures quite different from the social interactionist material discussed above, a central element of SA is the cognitive assessment activity of maintaining a definition of the situation, which suggests some shared concerns there as well. Perhaps the most useful contribution of this work is the integration of individual and social levels of cognitive orientation in interaction information use environments. The elements in the environment of which one might be more or less aware will differ by systems and contexts. For example, for aircraft pilots, altitude heading, airspeed, traffic, and meteorological conditions are relevant elements, but their relevance will vary over time. In other situations, such as in interactive IR, different elements will be relevant, and a task for IR researchers is to specify these elements.

An obvious weakness of the SA model is that lack of specificity with respect to the identification of relevant elements of the IR or information-seeking situation. In her model, ENDSLEY (1995b) stresses the importance of particular elements in the environment that need to be perceived and understood, and since these elements are unique to individual systems and contexts, they obviously can't be specified across all interaction environments by the SA model. As she notes, "Although the pilot and power plant operator each relies on SA, it simply is not realistic or appropriate to expect the same elements to be relevant to both" (p. 37).

PERSON-IN-SITUATION MODEL

In contrast to the SA theory, the person-in-situation model is a human decision-making model that attempts to account for the relationship between individual traits and situational-level variables on a variety of performance measures in different contexts. The person-in-situation model was first developed to account for attributes of persons, such as personality variables, cognitive traits, and abilities, as well as tasks associated with some larger goal that initiated the information seeking episode(s), that influence or interact with other information behaviors. In an early statement of this theory, SNOW presents an overview of person–situation interaction theory with respect to intelligence. The basic framework of this model is concerned with accounting for the multidimensional nature of intelligence, reasoning, and problem solving under varying conditions. Snow reviews several arguments about the nature of intelligence, noting that it is multifaceted, multileveled, hierarchical, and not modular. He then advances four propositions of his own about the personal nature of intelligence and

learning abilities. Two are of interest here. Snow suggests that intelligence and learning ability are "both pervasive and situated" (p. 13) and that "intelligence is personal" (p. 15). By situated he means that there are a wide variety of situations that can be characterized as relatively unstructured and complex and that there exist incomplete learning environments that nevertheless require high performance. Such situations require "flexible adaptation and agility in inferential evaluation" by the learner (p. 14). Intelligence is personal to the extent that each person has a unique learning history, or stock of knowledge, among other reasons.

Although SNOW casts learning and intelligence in individual cognitive frameworks, he stresses the relational aspects of these two variables, and this is the crux of the person-in-situation theory.

> But to say that intelligence is situated and personal is to claim much more than that it is specialized by types of situations and types of persons. It is to claim that intelligence is fundamentally a relational, relativistic construct; that is, it should be interpreted as existing in the person-situation interaction, not in the head of the person alone or in the structure of the situation alone, but in the "interface" between them. This means that defining the situations in which intelligence operates is part of defining intelligence. It also means that person-in-situation—the person-situation union—is the unit of analysis, not persons or situations or bits and pieces of persons and situations independently. (SNOW, p. 15)

In simpler language, Snow describes the person–interface in terms of the affordance theory of GIBSON. Each situation is a stimulus environment with its own set of affordances or things that it can offer the person. At the same time, a person must have the capability to accept the affordances that are available. "So a situation is an assembly of affordances with respect to some particular person or kind of person . . . . Particular affordances reflect particular actions" (p. 18). As noted here by Snow, the nature of individual differences makes it unlikely that situations will be uniformly effective in the suitability of the affordances they offer. Further, Snow states that it is difficult to identify specific elements of situations that influence task performance in certain contexts. He uses the example of academic task performance and says, "On the situation side, one can think of instructional treatments as composed of particular sequences of learning tasks and embedded in particular classroom or school contexts. Situation variables might then be defined within or across these three levels. But so far there are no models, hierarchical or otherwise, of such situation variables" (SNOW, p. 12).

For a review of the person-in-situation approach from this perspective of individual-level decision making and intelligence, see PERVIN or the collection of papers in STERNBERG & WAGNER. In other, psychologically oriented formulations of the model, attention has been given to personality traits of individuals that are associated with situationally constrained behaviors. For example, DOERNER looked at judgment and reasoning abilities in experimental situations in which subjects were given a simulated computer version of a hypothetical town and asked to rule the town by acting as mayor. Some of the decision-making tasks concerned taxation, education policies, transportation, and so on. Of interest to the authors were the personality characteristics of the "bad" subjects, those who made poor judgments within this situation. One of the findings was that lack of positive feedback was associated with poor performance. The authors suggest that low self-esteem associated with lack of positive feedback in the uncertain situation in which subjects were placed created a feeling of fear and loss of control, which led to failure at the task. In another psychologically oriented approach to person-in-situation theory, DIENER ET AL. examined the relationship between personality characteristics of individuals and the types of situations they prefer to be in. The underlying idea in this psychological thinking is that people who have different personality traits may not be comfortable in the same situations. Common examples given in this literature are that introverts may not want to go to loud bars and serious intellectuals might tend to spend time in serious, reserved situations. Diener et al. challenge this assumption, and the experiment they conducted to test it did show mixed results. Whether there might be some match between personality trait and choice of information-seeking situation is an interesting but open question.

Person-in-Situation Theory and Information Science

The person-in-situation theory has been looked at within IS, where explicit attention has been directed to task situations and performance variables as units of analysis (ALLEN, 1996, 1997; ALLEN & KIM; REID). In an early formulation of this approach, ALLEN (1996; 1997) provides a framework for understanding the matrix of social and individual factors that come into play in explaining information needs and uses and information-seeking behavior. Allen accounts for the social nature of information behaviors by placing individuals within organizational, institutional, and other social membership categories. Clearly, information behaviors are embedded within these social memberships,

and much of the literature on social interaction theory takes this into account. However, Allen points out that while individuals are located within multiple social arenas, they also have personal, individual-level characteristics or traits that influence information behaviors. Examples of some of these individual-level variables may be knowledge structures, cognitive and learning styles, and personality traits. To develop models of information needs and uses further, according to Allen, we need to reconcile these two competing explanations of information behavior and even look further into fresh perspectives as well. Allen proposes the adoption of a person-in-situation approach in which he argues for an interactionist perspective on the relationship between situational and individual determinants of behavior. His conceptual thinking is grounded in the person-in-situation models described above, which he reviews (ALLEN & KIM) extensively, concluding that the literature has demonstrated inconclusive results with respect to the relative importance of situational vs. individual factors on task performance.

In recent research, ALLEN & KIM further extend the theoretical model of person-in-situation, first articulated in the IS literature by ALLEN (1996), by conducting an experimental evaluation of person-situation interactionism. Allen and Kim tested the hypothesis that characteristics of the specific task assigned to subjects (the situational variable) would interact with individual traits, such as cognitive style and abilities to influence types of information behaviors. In different experimental conditions, Allen and Kim found significant relationships between personal variables, such as cognitive abilities and task performance, but no significant interaction effects between these individual and situational variables on information behaviors. They conclude that individual traits and situational variables, such as information task environments, operate independently on information-seeking behaviors.

Significance of person-in-situation model for information science. The person-in-situation approach is an important attempt to bring together individual-level and social- or situational-level variables in a unified model of information-seeking behavior. In some respects, this perspective follows in the footsteps of PAISLEY and T. D. WILSON (1981), who gave early attention to the social situational matrix within which information behaviors occur. In evaluating the significance of the person-in-situation model on its own, however, it seems as if a weakness of the approach stems from its ambiguous conceptualization of situation. The work of Allen and Kim represents an important first step toward understanding human information behaviors from an interactionist perspective that tries to account for the relationship between individual traits and situational factors that influence information behaviors. However, further development of the framework will require considerable conceptual clarification with respect to the central concepts of situation, context, and tasks.

SITUATION ENVIRONMENTS

Information Environments and Information Science

The final perspective to be considered here looks at situation from an environmental or ecological perspective. While not representing any particular theoretical position as such, there have been studies in a number of domains that have looked at the concept of situation from within this framework. As an example of environmental concepts of situation, we can consider various insitutional, organizational, or task environments within which information behaviors take place. The salient aspects of situation in this framework concern the situations of use. The writing of TAYLOR (1991) on the information use environment is an early example of this perspective.

The concept of a situation environment traverses individual, social, and organizational contexts. In 1981, T. D. WILSON (1981) made the observation, "Because the situations in which information is sought and used are social situations, however, purely cognitive conceptions of information need are probably inadequate for research purposes" (p. 9). However, for Wilson, the social aspects of information-seeking behavior were not entirely contained within social interaction: "The search for determining factors related to information seeking behavior and uses must include aspects of the environment within which the work-role is performed. The immediate work-environment and its climate has been mentioned above, but the socio-cultural environment, and the physical environment, will all have an impact in particular ways" (p. 10). The usefulness of this framework comes into play when we examine the relationship between types of situational environments and information behaviors, such as information-seeking behaviors, information-use behaviors, and evaluation of information items.

Task environments. A significant body of research has looked at a person's task environment as a relevant situation within which information behaviors take place. ALGON (1997; 1999) presents a taxonomy of tasks and their relationship to information behaviors. Based on her field analysis of individuals working on project teams in the pharmaceutical industry, she developed a classification of tasks within the work-group situations that were related to information-related behaviors. The task environment she studied is especially interesting, owing to its highly competitive nature during the drug development process. Her analysis, conducted over three years, led to a classification of tasks

and information-related behaviors. She discovered three important facets related to information finding/seeking, information using, and information providing. Each behavior was related to both tasks and stages in the research development process.

In other recent research, MIWA explored the task environment as the external social and environmental situation in which people turn to human intermediaries for help in solving information problems. In this case she studied users of the AskERIC telereference service. A significant result of this research is the development of a taxonomy of tasks requested of intermediaries and a classification of six situational categories that users perceived to be salient in requesting help from the intermediaries: (1) types of information problem-solving processes, (2) information needs, (3) cognitive states, (4) affective states, (5) social contexts, and (6) environmental conditions. This work is especially interesting because it takes a total environmental perspective on the use of the information resource, including task, cognitive level, and situational factors.

Within the communication literature, CALDWELL ET AL. examined the relationship between the appropriateness of different communication media for information exchange across task and situational variables. The most significant situational variables that were found to be related to type of information and media were time, urgency of the message, and distance between communicators.

Usefulness of information environments. As mentioned above, attention to information use environments as situations of information use dates back at least a decade to TAYLOR (1991). There is by now a large and rich literature on the various information environments within which information behaviors take place. Within this literature, the concepts of information environment, context, and situation are often used interchangeably. The concept of situation is not treated as an analytic unit in itself. For this reason, the environmental perspective on situation is less useful than other perspectives discussed above in terms of furthering the development of situation as a unit variable in IS.

CONCLUSION

The Multiplicity of Perspectives on the Concept of Situation

This chapter has reviewed six approaches to conceptualizing and empirically investigating the concept of situation. All of these perspectives have some potential relevance to IS, and, indeed each has been looked at to some extent within the IS literature. The chapter has attempted to discuss the strengths and weaknesses of each for explaining phenomena of interest to information science. Based on the literature reviewed, several conclusions can be drawn.

First, this review illustrates the usefulness to IS of situation as a focus of analysis in its own right. While the concept of situation has deep historical roots in IR theory, more recently there has been a return to the concept of situation in the IS literature as a way of understanding IR interaction and information behavior within a social and broader environmental matrix. Situation has the potential for being an important unit variable in further theoretical developments of information-seeking behavior and use and IR interaction. On a theoretical level, the concept of situation has the potential for bringing together both individual cognitive-level and social-level analyses of human information behavior. While the concepts of context and situation are often used interchangeably in IS as well as in many other disciplines, if we embrace an interactionist framework in IS, the concept of situation can usefully be disambiguated from context. Situation is the dynamic aspect of context. Situations with respect to IS are interaction spaces. A fuller exploration of the concept of situation as a central unit of analysis offers the possibility of developing both interactionist and cognitive viewpoints further in IS.

Second, it is clear that there is no theory of situation in IS, and in the current literature there is no single definition of what constitutes a situation. However, rather than ask "what *is* a situation," we might more productively ask "what conceptualization of situation addresses what sorts of questions of interest to information science?" The perspectives on situation surveyed here are multilayered, spanning individual, interactional, and social levels of analysis. As discussed, each perspective draws attention to specific research questions that can further our knowledge of information-seeking behavior, use, and IR interaction in a variety of information spaces.

Finally, the development of situation as a central unit of analysis in IS depends on further specification of the constitutive elements of situation that play a role in information behaviors, especially within a variety of IR interaction situations. With respect to IR systems, people are increasingly interacting with new information features and functionalities. Future research needs to identify the important elements of these new information interaction situations that play a role in IR interaction and that warrant an analysis in their own right.

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2 Conceptual Frameworks in Information Behavior

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INTRODUCTION

This chapter traces major conceptual developments in the information behavior literature since the user-centered paradigm shift observed by DERVIN & NILAN in 1986. In their landmark *ARIST* review, Dervin and Nilan emphasized calls in the post-1978 literature for conceptual enrichment within the field. Acknowledging that research studies have not informed practice, they noted calls for borrowing theory from the social sciences, for developing theories and conceptual frameworks, for examining basic assumptions and definitions, and for improving the predictive value of theory. They followed their insightful observation of a paradigmatic shift from a system/resource approach to an alternative one, characterized by its focus on constructive, active users, subjective information, situationality, holistic views of experience, internal cognition, systematic individuality, and qualitative research with three examples of scholarship that represent promising roads—namely, the user-values or value-added approach of TAYLOR (1984; 1985) and MACMULLIN & TAYLOR, the Sense-Making approach of DERVIN (1999a), and the anomalous-states-of-knowledge (ASK) approach of BELKIN ET AL. (1982a; 1982b). Documenting the field's quantum and revolutionary conceptual leap and achievement of critical mass, they challenged researchers to continue inventing new ways of looking at users and linking systems to them (DERVIN & NILAN, p. 24).

As HEWINS confirmed in her 1990 *ARIST* review, there is little doubt that a user-centered approach to studying information behavior has pervaded the literature and has begun underscoring the design and management of information systems. She also remarked on the prevalence of the cognitive approach for framing information behavior prob-

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