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Time is of the essence: Social theory of time and its implications for LIS research

Abstract: "Time," like "information," is a concept that has received a great deal of attention in some disciplines and is ignored or taken for granted in others. Traditional studies of information seeking have focussed on spatial issues – primarily, locating/ location of sources – to the neglect of temporal issues. This paper proposes that the social constructivist theoretical paradigm recently adopted by LIS researchers demands recognition of *social time*; that is, not absolute time, but another type of meaning constructed between people through their interactions. Attending to social concepts of time can have important implications for research into organizational and individual information behaviour.

Information practices in organizations and work groups within organizations cannot be fully understood without acknowledging the multitude of times that exist within such groups. Studies of workplace information practices focus variously on organizations, project teams, task forces, crews, departments, etc. Each group has a different temporal existence based on its practices. For example, organizations, departments and communities imply longevity as well as duration. We describe a developing study of information practices in a limited-duration work group.

Traditional studies of information seeking often consider individuals' descriptions of their information seeking behaviour as transparent representations of underlying cognitive processes. A constructivist stance permits an analysis of the ways that accounts of information seeking can take discursive action: the ways that such accounts are structured and the ways they may be used to make claims about individuals' general behaviour or competence, and to prescribe or proscribe certain sets of activities. The concept of "time" may then be used as a discursive resource by individuals in a social interaction. We report findings from a study of the ways that information seekers may use various representations of "time" in justifying certain kinds of information seeking behaviour.

1. Introduction

"Time," like "information," is a concept that has received a great deal of attention in some disciplines and is ignored or taken for granted in others. Traditional studies of information seeking have focussed on spatial issues -- primarily, locating/ location of physical sources. This paper proposes that attention to the concept of time can have important implications for research into organizational and individual information behaviour. The social constructivist theoretical paradigm recently adopted by library and information science (LIS) researchers demands recognition of *social* time; that is, neither the absolute time nor the quantum time of physics, but social time as another type of meaning constructed between people through their interactions (Lewis & Weigert, 1981). Barbara Adam (1990, 1995) has argued that individuals and organizations are quite skilled at conflating a wide variety of time concepts and living with them as though they were coherent (e.g., clock time, body time, individual biographical time). We introduce Adams' approach to time and present some implications of

this perspective for LIS research into organizational and individual information seeking.

2. Natural and social science theories of time

Barbara Adam is a sociologist of time. It is her aim to "move beyond the time of clocks and calendars and to make explicit what constitutes a largely unreflected aspect of contemporary social science: time embedded in social interactions, structures, practices and knowledge, in artefacts, in the mindful body, and in the environment" (1995, 6). It is Adam's contention that an understanding of natural science's theorizing about the nature of time is crucial to understanding the way time is treated in the social sciences (Adam, 1990). Briefly, then, we will summarize the major theories in natural science, namely physics, for understanding time.

Library and Information Science researchers might be surprised to learn that their research, as well as most social science research, owes a debt of gratitude to Newtonian physics. Time, in Newtonian physics, is measurement and measurable. It is a measurement of motion, duration, and rate. It is divisible into units, quantifiable. Under certain conditions it is reversible; that is, there is no difference between past and future. It is absolute and objective: unaffected by the changes it describes. Einstein saw time as relative to observers and their frames of reference; in other words, time has context. Everything that is possible must happen at less than the speed of light. Quantum physicists found that causality lost its meaning at the subatomic level. A causal relationship requires that events be separated temporally but in quantum theory the differences between matter and energy and time are so small as to be indistinguishable. Thermodynamic change theorists said that energy can be neither be created nor destroyed but neither can it revert to its original form; it becomes dissipated energy. Thus a conceptualization of time as irreversible was established.

While admitting that Einsteinian and quantum physics and thermodynamics had little direct influence on social theory, Adam (1998) contends that changes in the natural sciences conceptions of time do filter into the social sciences. Next, we review in broad strokes the three major schools of thought among social theorists regarding time.

Functionalist/normative social theory sees time as important in studying society and the functionalist view of time corresponds to the functionalist view of society: the emphasis is on "the when, how long, in what order and at what speed" (Adam, 1995, 74). Time is only a variable because it can be measured:

> Time studies located in the theories of temporal order, synchronization and regulation not only exclude the body, the physical environment and all that is invisible to empirical study, they also tend to leave untouched questions of power vis-à-vis processes of knowledge formation (Adam, 1995, 74).

Secondly, the critical/Marxist tradition focusses on time as a resource that has exchange value. This theoretical viewpoint accepts the quantifiable time of the functionalists but shifts attention to what lies behind the proliferation of mechanistic timekeeping devices. The clock represents worktime in Western, industrialized society and it is through work that time is a

means of control and a source of power.

Thirdly, the social constructivist/interpretivist viewpoint introduces relativity to the perception and conceptualization of time. Individuals are constantly aware of their own end and they live with this knowledge as Heidegger (1996) described it: "being unto death." Awareness of past and future is in every human moment and it matters where an individual is along their own continuum. "Just as objects appear differently depending on their spatial nearness, events also appear differently when they are temporally near than when the 'same' events are temporally distant" (Lewis & Weigert, 1981, 436). There are multiple timeworlds wherever human beings gather.

While the functionalist/normative and critical/Marxist traditions of social theory focus on clocktime, the social constructivist/interpretivist theorists see time as constituted by the interaction of human beings with their environment, particularly their interaction with one another (Adam, 1995, 80).

3. Temporal elements in information needs and seeking research

What does all this theorizing about time mean for the study of information needs and uses in LIS? LIS research has a history of strong emphasis on spatial issues, notably: storage, retrieval, organization, delivery, space-planning, acquisition and de-acquisition, shelving, architecture, etc. Research has been what Budd (2001, 196) describes as "physicalist," or, concerned with "actions taken by the library or by users;" that is, movements through space.

Information needs and uses (INU) studies can be broadly categorized into three research paradigms: systems, cognitive, and social/discursive. The earliest INU studies were conducted from the perspective of the information system: how it could be improved or how the users could change their behaviour to derive more from the system. The predominant view of time within this paradigm is the functionalist/Newtonian view: time as measurable and objective. Using Brenda Dervin's metaphor of bricks in the basket -- information as discrete bricks that fill the mind (basket) of the user -- to conceptualize the systems approach to information, one can also see the Newtonian concept of reversibility at play: removing the "bricks" of information leaves the user unchanged. The principal research method in the systems paradigm was the survey. Surveys ignore time:

> The assumption behind [a survey] is that all the people included in the sample, even though they are interviewed over a period of months or years, can be compared with each other regardless of when they were seen. Time is stopped. Mrs. Two O'Clock is treated as though she is the same as Mrs. Eight O'Clock, Mr. January as though he is Mr. March (Young, 1988, 21).

The cognitive paradigm allowed researchers to examine information needs from the users' perspective. A number of process models of information seeking (for example Westbrook, 1996; Kuhlthau, 1993; Ellis, 1993; Wilson, 1997) consider time implicitly. However, it is only in Dervin's sense-making, the most widely-used perspective within this paradigm, that

different *kinds* of time receive attention. In sense-making, the individual identifies a need for information upon encountering a gap in his or her knowledge that prevents his or her journey from continuing through time-space. Time is discontinuous in sense-making: it stops when a gap is identified.

The constructivist/interpretivist view of time is fundamental to sense-making. *When* an individual seeks information is as important as *what* he or she seeks. In other words, individuals are different at different moments in time-space. Dervin conceptualizes individuals as "time-space-bound," and stresses the need for fewer "across-time-space formulations," or generalizations, and more "time-space-bound formulations," or situational assessments of information behaviour (Dervin, 1992, 63). Information, then, is "that sense created at a specific moment in time-space by one or more humans" (Dervin, 1992, 63).

Sense-making recognizes many features of time, including the seeming paradoxes: time is discontinuous and yet we live in it and are continuous, time is linear but not reversible, it is phenomenological for the research participant but objective for the researcher, time is also linear due to the emphasis on progress toward a complete state of knowledge, and cyclic in its recognition of repetition of past behaviours (Dervin, 1992). The research method in sense-making is the timeline interview in which an individual is asked to recount in linear fashion the actions and feelings involved in recognizing a cognitive gap and seeking information to fill it.

The social constructivist or discursive paradigm in INU research seems to be the likeliest place to be able to recognize and allow for multiple timeworlds in people's lives. The social constructivist paradigm puts emphasis on social practices and holds that the knowledge, even the realities in which people live, are created in interaction with other people, principally through language or "discourse." The research methods for scholarship in this paradigm are qualitative: ethnography, interviews, discourse analysis, etc. Qualitative or naturalistic research assumes that "realities are multiple, constructed, and holistic" (Lincoln and Guba, 1985, 36-8) and it is here that multiple social times may be recognized. Lewis & Weigert say that social time should be "interpreted as another form of human *meaning* constructed in the processes of interaction, limited by the physical realities of organism and nature, and structured into the institutions and organizations of each society" (1981, 450). In the social constructivist paradigm we choose to examine not information behaviours but "information practices," for it is within practices that unfold over time that we create the systems and structures of society, including information systems (Rosenbaum, 1993). Information practices encompass the entire range of information seeking including practices beyond the scope of what Wilson (1997) calls "information behaviour."

A constructivist approach to time means attending to participants' understandings of time. In the context of organizational information practices, this means recognizing the multiplicity of individual, group, and project-level timelines constructed by participants in a working group. In the context of individual information practices, taking a social approach to time means listening to the ways that individual information-seekers construct time in their accounts, and the ways that the use of time in accounts constructs individuals as information seekers.

4. Time and organizational information practices

INU research has largely ignored the multiplicity of times in studying the information needs and uses of professionals. Paul Solomon's (1997a, 1997b) ethnography of a planning unit over three annual planning sessions revealed the importance of time not only in sense-making but also in group development. "The process of meaning development is both fundamental to complex, multiparty, information intensive tasks and takes time. It is the use of time for extracting cues, sharing ideas, arguing, thinking, and creating messages that enables sense making" (Solomon, 1997b, 1125). Solomon's work seems to stand alone in its explicit recognition of the importance of time in workplace information practices.

In the INU studies of professionals we have the strongest sense of time as resource. The studies themselves are often conducted with a view towards improving the delivery of information services in order to increase productivity (Pinelli et al, 1993). Engineers, physicians, nurses, lawyers, and business managers are surveyed, questioned, followed around, and mapped onto decision-making charts in order to determine to which information resources they most commonly refer. There is a strong assumption that time is the same for all the professionals in a particular workplace: the shift is the same length or the project is the same duration. One element often not explicitly mentioned in INU studies of professionals is that professionals work in organizational structures such as institutions, corporations, or private practice, and within these overarching structures, in formal and informal groups such as departments, communities of practice, task forces, crews, and teams. Membership in one or more of these organizational structures or groups may account for more differences in information practices than membership in a particular profession because of the way time is constructed and perceived by the members.

Organizational structures such as institutions and corporations have histories and indefinite futures; they have duration. Task forces, crews, and other ad hoc groups have limited duration: the members know when the group will dissolve; they have no collective history and no collective future. Departments, teams, and communities of practice will last as long as they are effective (Arrow, McGrath & Berdahl, 2000; Wenger, 1998).

Work groups have their own multiple times depending on the nature of the group: project deadlines and milestones, life-cycle of the group, coordination of members' activities so that they temporally fit together such as vacation times and shift scheduling, seasonal adjustments required for Christmas for retailers, summer stock for actors, spring and fall publishers' catalogues (see Arrow, McGrath & Berdahl, 2000; Young, 1988). It is known that the longer a particular group stays together, the less it learns over time (Katz, 1982); that members of an ad hoc group are more likely to emphasize the information they have in common than the unique knowledge of any individual (Gruenfeld, Mannix, Williams et al., 1996); that groups undergo a fundamental shift in activity and behaviour at the midpoint of their existence, becoming more focussed and efficient (Gersick, 1989). All of these features may affect the information practices of a work group.

Another element of time that may affect professionals' information practices is the conflation of worktimes:

[…]artists, carers, and people providing services compete on unequal terms with occupational groups whose work is amenable to translation into the clock-time units. Such inequality turns into a major problem where the principle of commodified time has been politically imposed across the board, irrespective of suitability: where it has been thrust upon business, education and health services, theatre companies and the visual arts community without regard for their unique temporal complexities, and where evaluation is conducted on the basis of commodified time (Adam, 1995).

Davies' developing research on theatre professionals began with what seemed to be a simple exercise: create a timeline of the production of a play. She consulted professionals within the theatre community: an actor, a lighting designer, a stage manager, a playwright, and a production manager about when the play begins and when it ends for them. The results are depicted in Figure 1.

• For the playwright the play begins with a character. Draft #1 in the playwright's example took 18 months, the final or "publication draft," two days. The play ends with the publication draft which is produced following the initial full production of the play.
• The actor auditions during what is referred to as "pre-production" which can be up to a year prior to rehearsal, then re-enters the timeline for rehearsal which includes run-throughs, dress rehearsal, and the run. The play ends with the final performance.
• The production manager ensures that the theatre has the equipment, money and crew to produce a particular play and is involved from the pre-production phase when the costing is done to the clean up immediately following the final performance when all the sets, costumes, lights, etc. must be taken down and stored.
• The stage manager enters the timeline in what he or she calls "prep week"– the week immediately preceding the beginning of rehearsal – and stays until the final performance.
• The lighting designer, unlike other designers, who submit their final designs for costumes, sets, and sound during the "production" phase, cannot submit a final design for lighting until he or she has seen the actors in rehearsal. The lighting designer is then heavily involved during "tech week" when the lights are hung and focussed.

The production manager spoke of the play as divided into phases: pre-production, production, rehearsal, tech week, previews, opening and run and the clean up. The stage manager spoke in weeks and days: prep week, then the 2-6 weeks of rehearsal, tech week, 2-3 days of previews. The playwright measured time in drafts. Once the actor knew he had the part, preparation was ongoing, the run of the show was merely an extension of rehearsal. He did not use the term "tech week;" for him it was run-throughs and dress rehearsal. A preview is a full performance with audience on the day of a rehearsal but, for the actor, there was no differentiation between previews and the run.

Another element of theatre work is the number of hours worked in a day which varies depending on the phase of production and the specific job. In rehearsal, 12-hour days are typical, while during the run on single-performance days, 4-5 hours might suffice. Away from the workplace, Van Maanen and Barley (1984) point out that professionals or members of an "occupational community" may find themselves out of sync with the rest of society depending on their working hours. Work hours therefore affect professionals' leisure time,

educational, and social activities. Given (2000) found that erroneous assumptions about mature students' work time led to the creation of restrictive educational and library service policies in educational institutions.

Constructing this simple timeline revealed some of the multiple times involved in the production of a play in a professional theatre. There is a sequence of events which begins and ends differently depending on one's specific job, there are different words to describe what appear to be the same segments of calendar time, there are extensions into the past and future that differ for each individual, there are times of intense cooperation and isolation, and there are different time measurement units. All these multiple times likely have information practices associated with them. Uncovering these practices is the next step in this research.

5. "Time" as a discursive resource in individuals' information seeking accounts

Traditional studies of individual information seeking often consider individuals' descriptions of their information seeking behaviour to be transparent representations of underlying cognitive processes. A constructivist stance permits an analysis of the ways that accounts of information seeking can take discursive action (Tuominen and Savolainen, 1997), or the way that information-seeking accounts are structured as factual (the *epistemological orientation* of discourse) and the rhetorical purposes to which such accounts are put, for example whether to persuade, accuse, blame, or exonerate (the *action orientation* of discourse, Potter, 1996). This form of discourse analysis is beginning to receive attention in LIS (for example, Jacobs, 2001). McKenzie (2001) found that information seekers may use various discursive resources in constructing their descriptions of information sources as helpful or unhelpful and in justifying certain kinds of information practices. Here, we use a constructivist discourse analytic approach to analyse the *action orientation* of individuals' accounts; specifically, the ways that participants used the concept of "time" as a discursive resource (Taylor and Wetherell, 1999) to make certain kinds of claims about themselves and to justify various kinds of information seeking behaviour.

The results presented here come from analysis of transcripts of 36 in-depth interviews with 19 women who were pregnant with twins (McKenzie, 2001). Pregnancy proved to be a rich context in which to study time and information seeking for several reasons. First, a pregnancy has a finite duration. In the absence of complications it involves fairly extensive contact with the health care system for a relatively short period of time, after which time contact with formal health providers returns to the former level. Second, a pregnancy becomes increasingly visible to others as it progresses, inviting comments and questions from other people. Third, a Canadian pregnancy at the end of the 20th century follows a particular timeline of medical care. Violating that timeline can lead to disruptions of care. Fourth, as Gardner observes, "pregnancy is an opaque condition with an especially long period where results, good or bad, are not directly evident" (1995, 35). Finally, many writers describe pregnancy, particularly first pregnancy, as a period of transition to motherhood (for example, Deutsch *et al.,* 1988). A twin pregnancy is associated with additional temporal characteristics, largely because of the increased risk of premature birth (Joseph, *et al.*, 1998). A popular pregnancy book uses the shortened timeline of twin pregnancy to urge prospective

parents to become prepared:

> In one of nature's exquisite ironies, parents of twins have *less* time to prepare
> than their singleton counterparts. On the average, gestation for twins is two to
> three weeks shorter than it is for singletons... so forget any ideas you may have
> about last-minute preparation: By the time you get close to delivery,
> everything will feel like it ought to have been completed yesterday! (Agnew,
> Klein, and Ganon, 1996, 161)

Prematurity was a common theme in participants' accounts, and discussions of due dates, prematurity, and "carrying to term" form part of women's talk about their pregnancies.

The participants in this study ranged from 19 to 40 years of age. In many characteristics (first language, ethnicity, place of residence), participants were representative of the Ontario region in which they lived, although they tended to be older and better-educated than expected. All were living with the fathers of their babies, and six had other children. Four participants were unemployed or at home with other children, while the others had jobs in a range of blue-, pink-, and white-collar occupations. At the time of the first interview, participants ranged from 11 to 35 weeks pregnant. With the exception of two women who were hospitalized, participants were interviewed twice about the information-seeking context, their information needs and seeking within that context, and the authority of the information sources they used. The accounts quoted here are taken from interview transcripts. Participants are identified by pseudonyms throughout.

When discussing the ways they prepared for the births of their babies, participants used two major discursive strategies. First, they described themselves in terms of characteristics related to being organized, in control, or proactive. Second, they described themselves in ways that emphasized their patience, flexibility and ability to adapt to the unexpected and learn as they go. Both time and information seeking played important roles as discursive resources in these kinds of descriptions.

6. Time as a spur to active information seeking

In many cases, pregnant women used descriptions of their information seeking as evidence of being organized and proactive, calling on the short duration of multiple pregnancy as a "spur" to active information seeking. Several women described active information seeking as a coping strategy for dealing with a short timeline. Christine said that "the more knowledge you have now the better informed you are." Rachel described her sense of urgency about seeking information: "I think, the fact that I'm having twins I find, all of a sudden I've got to *know* all this stuff beforehand. You know, where I said to my husband, 'If I were having one [baby] I don't think I'd be even thinking about this.'"

"Being organized" to cope with a short timeline was therefore presented as evidence that a woman was adequately preparing for impending motherhood. Active information seeking was an important example of being organized.

7. Time as a barrier to information seeking

Of course, not all the accounts that pregnant women provided included descriptions of active information seeking. Participants used two major strategies to explain why they would or should not be seeking information at this time. Jacquie described how her organizational skills prevented her from actively seeking information before she had completed other tasks: "I think I like to organize myself, like finish one thing and then. That's how I am. Instead of trying to do too much at once and then nothing gets done." Rather than describing time as a spur to information seeking, Jacquie presents time as a barrier, and her account justifies her information seeking behaviour without compromising her presentation of herself as organized.

In other cases, participants described concerns as unknowable or unanswerable until some particular event had occurred. In these cases, representing time as a barrier to information seeking allowed participants to justify not seeking information and to emphasize personal characteristics such as patience, adaptability, and flexibility. Sometimes, participants described a window of opportunity in which seeking information about a certain issue would be appropriate to their psychological state. Natalia observed that "you just wrap your mind around one thing. You're not *ready* to think about labour yet." In other cases, there were some areas of knowledge that women accepted as temporarily unknowable, and for which there was no point in actively seeking information now. Lynn was wondering about breastfeeding, "but I *know* that there's no point in wondering about it at this point in time. Cause until the babies are actually here, I'm not going to know how things are going or how I'm going to do it." Both of these strategies showed that participants recognized when seeking information was inappropriate.

Occasionally, participants paired these descriptions of their flexibility and patience with evidence that they were organized and prepared actively to seek information once the time was right. Stacy described finding out about childcare for her unborn children. "And, it's too early to start asking people now, cause I think September is kind of the time where they figure out which kids they're going to have, and then we'll start looking probably in September and October." Women used phrases like, "I just figure that, I'm just going to learn," (Rachel); "We'll just figure it out" (Stacy); and "take it one day at a time" (Donna); "We're flexible. You *have* to be." (Christine); and "I just figure that I'll learn as I go. You know, I consider myself to be a fairly intelligent person [laughs] that I should be able to, you know, kind of figure things out." (Irene). In this way, they were able to demonstrate they possessed both the flexibility needed to cope with uncertainty and the organizational skills necessary for active information seeking at a later time.

8. Conflicting representations of time in information seeking accounts

In some accounts, the representation of time-as-barrier, with its requirement of patience and flexibility, came into direct conflict with the representation of time-as-spur, with its imperative of active information seeking as a means of preparation. Rachel presented this conflict when she described the mixed messages she was getting. On the one hand, people were telling her not to worry too much about prematurity: "'Oh, you could go thirty-seven

weeks nowadays. People are carrying so much longer...' and I was like, 'Right.' But I don't want to *not* prepare." Erica expressed the conflict in terms of a disagreement with her mother. "I wanted to buy a double stroller. My mum says, 'Well maybe you should just wait until after they're born cause, you know, twins sometimes one of them doesn't make it.' She just, she's really negative like that."

Using the competing discursive representations of time allowed participants to create flexible descriptions of themselves as information seekers and to justify *both* actively seeking and not actively seeking information. Using a discourse analytic approach to studying individuals' information-seeking accounts helps to provide new insights on theories of information-seeking. The blunting hypothesis (Miller, 1980), for example, proposes that individuals have an overall orientation toward either actively seeking information or not actively seeking information in stressful situations. An analysis of the action orientation of information-seeking accounts shows that participants in this study described instances of both of these practices and used specific discursive techniques to explain and justify them.

9. Conclusion

Because time is taken for granted in the lives of researchers as well as in the lives of those they study, temporal elements of information seeking are easy to overlook. Researchers who fail to attend to temporal issues run the risk of missing significant contextual dimensions within individual and organizational information practices. We have outlined two possible approaches to a study of information practices that is sensitive to time. We invite other researchers to be mindful of the ways in which time is implicated in their own lives and in the lives of the information-seekers they study.

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Figure 1: Preliminary timeline of production of a play

	Selected	Pre-Production		Production	Prep Week	Rehearsal	Tech Week	Previews	Opening & Run	Closing	Cleanup
			Auditions								
Actor											
Lighting designer											
Stage manager											
Production manager											
Playwright	←										→