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Adoption as Sensemaking: Toward an Adopter-Centered Process Model of IT Adoption

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Abstract

Current technology adoption research focuses on relationships between attitudes, intentions, behavior, and their various antecedents, but little is known about how these relationships develop and the processes by which adoption actually takes place. Karl Weick's model of sensemaking in organizations is presented as a basic model for understanding adoption attitudes and behavior from an adopter-centered, process-oriented perspective. This perspective provides the opportunity for a much richer understanding of how adoption occurs and how it can be influenced. Seven properties of sensemaking are discussed in terms of adoption, the sensemaking model is compared to Rogers' innovation-decision process model, and many research questions are mentioned to guide future process-oriented adoption research.

1. INTRODUCTION

Recent IT adoption literature has focused on acceptance models relating perceptions and beliefs to attitudes, behavioral intention, and usage of the technology. Much of the most recent literature addresses the antecedents of these perceptions. What remain largely unexplored, however, are the processes by which these factors and others work together in adoption-related attitude formation, decision-making, short-term and long-term behavior, and mental modeling. Such a process-oriented perspective raises new types of questions. Instead of asking how adoption constructs *are* related, we begin to ask how and why they *become* related. Instead of discovering the strengths of relationships, we discover how they are formed, and we begin to ask whether the formation of the relationships can be altered so that the adoption process itself can be manipulated.

This paper uses Karl Weick's description of sensemaking from his book *Sensemaking in Organizations* (Weick 1995) as a starting point for an adopter-centered process model of adoption. Section 2 describes sensemaking and explains why it is an appropriate perspective for studying IT adoption. Section 3 discusses sensemaking briefly in terms of other adoption-related models. Section 4 discusses seven properties of sensemaking and their roles in the adoption process. Section 5 compares the sensemaking model of adoption to Rogers' innovation-decision process model. The final section mentions questions to guide future development of this sensemaking perspective.

2. ADOPTION AS SENSEMAKING

Weick (1995) provides only "the making of sense" as a definition for sensemaking, leaving his readers with the task of creating more operationable definitions. For the purposes of this paper, sensemaking is defined as the cyclical process of taking action, extracting information from stimuli resulting from that action, and incorporating information and stimuli from that action into the mental frameworks that guide further action. This definition is aligned with several existing perspectives. Waterman (1990) referred to sensemaking as the structuring of the unknown. Sensemaking has been described as the placing of stimuli into a mental framework (Dunbar 1981; Goleman 1985; Starbuck and Milliken 1988) that is used to direct interpretation (Cantril 1941).

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Sensemaking is the recurring process of forming anticipations and assumptions, and the subsequent interpretation of experiences that deviate from these anticipations and assumptions (Louis 1980). Thomas et al. (1993) call it "the reciprocal interaction of information seeking, meaning ascription, and action" (p. 240).

If technology adoption is a form of sensemaking, then it should have the following characteristics:

- it should be influenced by initial and evolving mental frameworks;
- users should have initial perceptions and understandings (i.e., an initial sense) about the technology;
- these perceptions and understandings should be subject to change based upon stimuli (information) that the user receives;
- the mental frameworks should be changed because of the incorporation of stimuli.

Figure 1 shows a general sensemaking cycle.

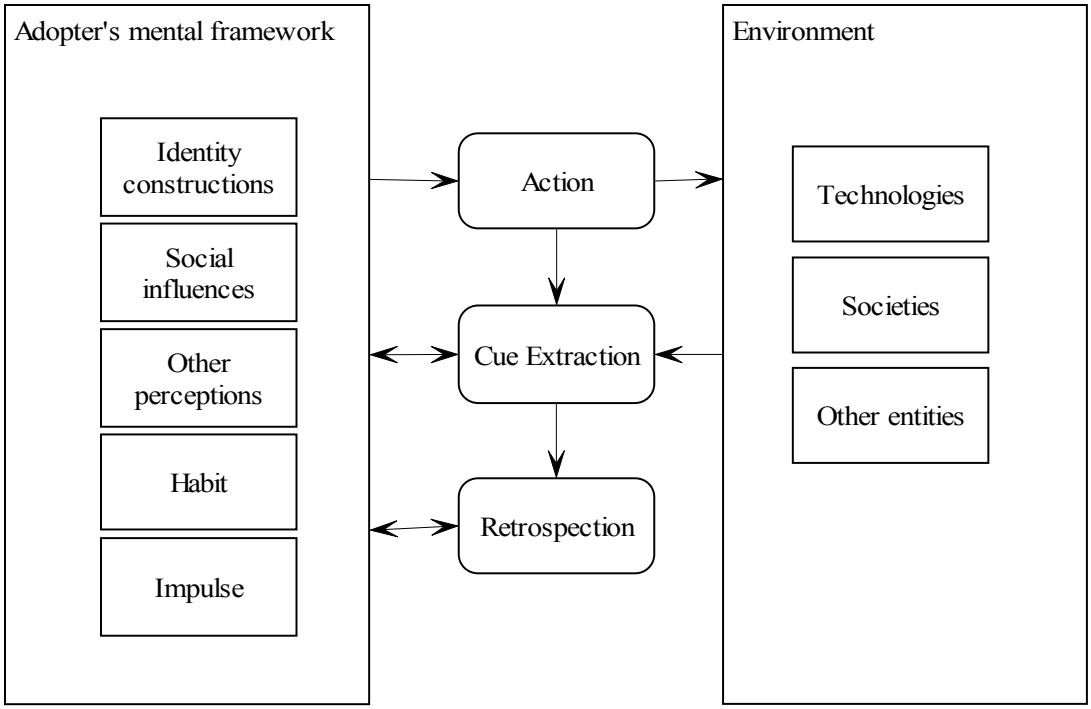

Figure 1. The Sensemaking Cycle

These sensemaking characteristics are exemplified in Prasad's (1993) study of symbolic processes during the implementation of technological change. Prasad found that the symbolism of computerization held by occupational groups within a healthcare organization changed as the computerization effort progressed from pre-computerization, through training and implementation, into the "adoption" phase of the process. Nurses, for example, initially represented the computerization process with such symbols as professionalism, inevitability, turmoil, utopianism, etc. As computerization progressed into implementation, the turmoil and utopianism symbols were no longer used, but the new symbol "otherness" (alienness) emerged. Therefore, through training and implementation, the mental frameworks of the nurses changed. Some perceptions were dropped and replaced by other perceptions. Especially important is the fact that mental frameworks were in place from the beginning and continued well after initial adoption as individuals who used the system were attributed increased social status within the organization.

Therefore, the adoption process does not begin at introduction to the technology, but rather substantially beforehand with the formation of initial perceptions and symbolic representations of the technology. Similarly, adoption itself does not take place as

a single decision, but rather as a series of sensemaking cycles causing perceptions of the technology to change until apparent adoption or rejection actions are performed.

3. OTHER MODELS OF ADOPTION

Several adoption models view adoption as a linear, decision-focused progression through stages such as knowledge acquisition, problem framing, decision, implementation, and confirmation (e.g., Mintzberg et al. 1976; Simon 1977; Rogers 1995). Mohr (1987) suggests that adoption can be modeled in a number of ways related to readaptation and routine change. Dean (1987) and others suggest that adoption is a political process driven by technology champions.

These approaches to adoption modeling view the adopter as a black box, i.e., they model adoption-related activities instead of modeling the adopter (Langley and Truax 1994). Sensemaking focuses on the adopter herself, i.e., her mental frameworks, and the antecedents and products of those frameworks. Sensemaking provides a look under the hood, if you will, of the adopter's mental engine. It is meant to compliment, not replace, these other models of adoption, just as an understanding of how an automobile engine works is complimentary to an understanding of how to drive. Focus on the adopter reveals a variety of new influences on the adoption process and begins to explain curiosities in other adoption models, e.g., Simon's (1977) puzzle of stages within stages being viewable as a series of sensemaking cycles.

The technology acceptance model (TAM; Davis et al. 1989) and the theory of planned behavior (TPB; Ajzen 1991) are both linear representations of a portion of the sensemaking process. TAM in its essence suggests that perceptions of usefulness and ease-of-use can be used to predict behavior. TPB uses both social and non-social perceptions as well as identity constructions (within "perceived behavioral control") to predict behavior. However, it is through sensible interactions with the technology and/or previous experiences with using other technologies and performing similar tasks that the potential adopter forms these perceptions. Because these perceptions are both outcomes of and contributors to the sensemaking cycle, it is just as accurate to say that action predicts cue extraction and retrospection, and that these predict perceptions of usefulness, ease-of-use, behavioral control, etc. It is also important to note that the sensemaking model suggests that the adopter's mental framework *as a whole* is an action driver. Habit, impulse, and other components of the mental framework combine with perceptions to drive action, and the framework itself may not be the only action driver.

Weick discusses seven properties of sensemaking, each of which will be discussed in the next section.

4. SEVEN PROPERTIES OF SENSEMAKING

Sensemaking is

1. grounded in identity construction,
2. retrospective,
3. focused on and by extracted cues,
4. enactive of sensible environments,
5. social,
6. ongoing, and
7. driven by plausibility rather than accuracy.

4.1 Grounded in Identity Construction

Sensemaking is **grounded in identity construction**, meaning that individuals learn who they are by acting and reflecting upon those actions and the actions of others. When a worker accomplishes a task and receives feedback from others about his work, he learns opinions not only about his work but also about his identity as a good or bad worker. It is, therefore, his action (the work he has done), the actions of others (expression of opinions), his observations (of the reactions of others), and his reflection upon these things that contribute to his understanding of himself as a good or bad worker.

Similarly, IT adoption directly impacts identity construction. A technology user may consider himself intelligent, cutting edge, aggressive, nerdy, professional, or other things because he has or has not adopted technologies. Prasad's (1990) study provided examples of this by noting that some employees felt professional, organized, intelligent, respected, etc., when they used the

information system. Interestingly, perceived adoption by *other* individuals, or even by other organizations, may also affect a person's self-identity. For example, a person may consider himself "cutting edge" until his co-worker obtains new equipment. IT adoption can impact an individual's social identity, as evidenced by the social status attributed to users of the system. IT adoption can even be a component of the constructed identity (Gremy et al. 1999), as in Weill and Bonnin's (1996) finding that hospital surgeons consider the adoption of new techniques and practices to be part of their professional identity.

Several research questions emerge from identity construction's impact on IT adoption. Whose identities are constructed by potential adopters? What factors are related to these identity constructions, and how can they be manipulated? How does identity construction differ in different social environments?

4.2 Retrospective

Sensemaking is **retrospective**, because a person can only make sense of what has already happened, not what is happening in the instant it occurs. If adoption is a sensemaking behavior then it is retrospective, which implies that behavioral intention, especially when measured before subjects actually use a technology, is a weak indicator of enduring adoption behavior since there is no real experience yet with the system. This implication is supported by Pfeffer's (1982) "emergent" view of action in organizations. Another implication of retrospective sensemaking is that adoption attitudes are formed by past adoption experiences or similar experiences in which the subject learned to use a complex tool. Antecedents of self-efficacy may, therefore, include past successes and failures at using various other complex technologies (a finding supported by Agarwal and Prasad 1999), experiences at adapting to new ways of working, etc.

Even more interesting is the notion that the mental framework that generates perceptions is subject to change during and after experience with the technology. Rice and Contractor (1990) found that technology adoption can change the conceptualization of office work. Such a reconceptualization can lead to remodeling of the relationships pertaining to IT adoption. For example, imagine that a potential IT user has certain norms and beliefs that influence his attitude toward adoption, including low self-efficacy. If his experience with the system improves his perception of that self-efficacy, will his mental framework evolve to exclude some of the norms and beliefs that were once important for considering technology adoption? Norms and beliefs are sometimes only justifications that protect a person from confronting the relationships between self-efficacy, attitude, and intention. How are other perceptions changed by experience with computers? What existing influences affect the way that experiences with technology are retrospectively considered? Can future technology adoption be influenced by changing the sense the adopter retrospectively makes of past adoption experiences?

4.3 Focused on and by Extracted Cues

According to Weick (1995), "Extracted cues are simple, familiar structures that are seeds from which people develop a larger sense of what may be occurring." (p. 50) Cue extraction is the process of noticing what is salient and useful for mentally representing stimuli. It occurs as both scanning and as focused search, and contributes to both the maintenance and evolution of mental frameworks.

Cues have several important characteristics. First, they are received as perceptions and, therefore, with subjectivity. Second, there is no reason to assume that everyone who experiences a particular event will pick up the same cues, or that two people who perceive the same cue will incorporate it similarly into their mental frameworks. Third, control over cues is a source of influence and power (Smircich and Morgan 1982). Fourth, since cues are extracted from encountered stimuli, people often fail to consider what cues they may have extracted from stimuli that they did not encounter (Sanbonmatsu et al. 1997). These characteristics suggest the importance of identifying the cues that people extract from their experiences with technologies, social contacts, organizational situations, etc., to understand how these cues affect mental frameworks.

Cue extraction may be subject to a variety of influences. How, then, does cue extraction differ in different social environments? What features or other characteristics of a technology become cues? How do different types of cues affect the resulting mental framework?

An individual enacts the environment from which she will eventually extract cues, e.g., an individual using an Internet search engine. The search engine prompts her for keywords (cues), and she decides how best to represent her topic of interest using one or more language cues and provides those cues to the search engine. Those cues guide the search engine to the information that it then presents to her. She has, therefore, substantially influenced the information from which she must now extract her cues.

Therefore, it is important that anyone who provides cues to an information system must have some skill in knowing what cues to provide; otherwise, the system's usefulness and adoption may be diminished. Additionally, users should understand the importance of context for choosing an information source. Do users know the differences in the types of information they can get from information systems versus other sources? Are users being trained specifically in how to cue information systems?

4.4 Enactive of Sensible Environments

Sensemaking is **enactive of sensible environments**, meaning that a person participates in the evolution of her environment and then must make sense of environmental events that resulted in part from her participation. One implication of enactment is the garbage-in, garbage-out principle. If the user does not enter data into an information system correctly, the system may fail to live up to her expectations and adoption may suffer. Another implication is that although compatibility of the system with the user's current behaviors is known to have an influence on attitudes toward the system (Taylor and Todd 1995), the user herself has influence over those behaviors. Therefore, the user manages the compatibility of her personal work environment with system usage.

This personal work environment may separate the user from social influences or other stimuli that would impact her perceptions of the system. For example, an individual's work habits may prevent her from interacting with adopters who attribute social status to the system's users. In this case, a reengineering of social contacts may change her perceptions of the technology. What environmental conditions constrain or support technology adoption? How are personal, social, and organizational habits related to adoption attitudes and behavior? How do a potential adopter's social contacts and the adoption behaviors of those contacts affect her behavior? How do individuals attempt to change their personal environments in response to new technology, and what factors affect the success of these environmental changes?

4.5 Social

Sensemaking is **social**, in that no one makes sense in isolation, but rather each person derives sense in part from the words and actions of others, and produces sensible action and discussion that contribute to the sensemaking of others. For example, each statement in group discussion contributes to the direction and outcome of the discussion. Each person contributes sensible statements or questions that in turn are used by the others as the discussion proceeds. The conclusions developed by a participant at the end of the discussion may not reflect the opinions of the entire group, but as long he listened to the discussion, his mental frameworks incorporated stimuli from the discussion and contributed stimuli by generating and contributing statements.

Because social interactions allow for the development of common sensemaking, it follows that group intra-actions strengthen the group's common sense (Bettis and Pralahaad 1995) and help them to self-organize around it (Aydin and Rice 1992; Brown and Eisenhardt 1997). These intra-actions involve the entire sensemaking cycle as each individual interacts with her social environment and develops her mental models based on the information cues extracted from those interactions.

Social impacts on the IT adoption process include:

- a person's adoption behavior being influenced by her perceptions of the adoption behavior of her workgroup, especially if the person is highly attracted to the workgroup (Fulk 1993);
- adoption being resisted if it is perceived to negatively affect the subject's autonomy, status, or relationships with other staff members (Rice and Anderson 1994); and
- the adoption behaviors of a group working closely together being different from the adoption behaviors of the same individuals working in isolation.

Social impacts have seen a good deal of study already. Ajzen (1985) and Ajzen and Fishbein (1980) used social norms as an antecedent of behavioral intention. Karahanna and Straub (1999) found social influences to be antecedents of perceived usefulness and perceived ease of use. Studies by Aydin and Rice (1991, 1992) and Rice and Anderson (1994) demonstrated that social worlds affect adoption attitudes. Socializing also allows for the sharing of symbolism, another form of representation and communication through cues (Prasad 1993; Stryker and Stratham 1985). However, the sensemaking perspective brings new questions. What informational cues are communicated during social interactions that affect technology adoption? In what forms, e.g., informative statements, opinions, jokes, etc., are these cues communicated? How should an adopter's connections be managed so that technology adoption is supported?

4.5 Ongoing

Sensemaking is **ongoing** because of the cyclical nature of the sensemaking process. A person acts, makes sense of her actions, and then acts again, guided by the sense that she has already made. In the minute term, the results and experiences of a user's first attempt to use a technology are part of the basis by which the user will decide whether or not to make a second attempt. Over time, continued use of a system affects the user's level of expertise with the system and the compatibility of the system with the user's other duties. This view is supported by structuration theory, which suggests that a technology can "condition" the practices of its users by facilitating and constraining user actions (Orlikowski and Robey 1991).

Additionally, many systems change over time due to software and hardware upgrades, maintenance changes, etc. The environmental, or contextual, conditions under which users work change over time as well. A system perceived as invaluable under certain conditions may seem trivial and wasteful under different conditions. Because of these changes, adoption behaviors at various points in time may differ because of system and contextual conditions. This perspective leads to such concepts as postponed adoption (the intention to use the technology exists but circumstances delay usage), re-adoption (using again what was used before and then abandoned), and periodic adoption (occasional usage and relearning).

The question arises, then, as to how organizational and contextual factors affect adoption at various stages of computerization. Additionally, what models of change are useful for understanding how mental frameworks change over time? Do these mental frameworks become more stable over time, like a learning curve, or do they demonstrate a form of punctuated equilibrium where users occasionally change their mental frameworks when their thoughts are focused on their information systems?

4.7 Driven by Plausibility Rather than Accuracy

Sense is not only an understanding of what is directly observable and accurate, but also the achievement of a level of reasonableness for a situation that is suitable for the sensemaker's needs. This "plausible reasoning," as Isenberg (1986) notes, exists even if the sensemaker has an incomplete or inaccurate understanding of the facts. Furthermore, plausibility is the result of preferential consideration of, and belief in, information. Weick quotes Fiske's statement that sensemaking "takes a relative approach to truth, predicting that people will believe what can account for sensory experience but also what is interesting, attractive, emotionally appealing, and goal relevant" (Fiske 1992, p. 879). The resulting sense is a type of preferential plausibility that frames stimuli so that the preferences of the sensemaker are addressed.

This preferential plausibility affects adoption-related attitudes and perceptions. Because the plausibility can stem from inaccurate or incomplete information, the sense that is made is not necessarily formed into a belief in what *would* happen (a probability belief) if the sensemaker adopted the technology, but rather an understanding of what *could* happen (a plausibility belief). For example, if a person was asked on a seven-point scale the extent to which he believed that his next automobile trip *would* involve a collision, he would likely pick the choice for least belief based upon his experience. However, he may adopt seat belt technology because he thinks that a collision *could* happen, and avoiding injury in the event of a collision is a strong preference of his. This distinction is important because many constructs in existing acceptance models incorporate beliefs about what *would* happen, not what *could* happen (e.g., Davis' (1989) perceived usefulness and perceived ease of use constructs).

With this understanding, what are the relationships between plausibility beliefs and user perceptions of and attitudes toward a technology? Are plausibility beliefs more emotionally driven than probability beliefs? How do emotional appeal and attractiveness affect adherence to plausibility and probability beliefs? How do these answers change in different contexts, e.g., common sensemaking in groups?

5. SENSEMAKING AND TECHNOLOGY ADOPTION

This section compares the sensemaking model of adoption to Rogers' (1995) innovation-decision process model (IDPM), the adoption-related part of Rogers' cornerstone contribution to diffusion theory. Rogers describes the innovation-decision process as "the process through which an individual (or other decision-making unit) passes (1) from first knowledge of an innovation, (2) to forming an attitude toward the innovation, (3) to a decision to adopt or reject, (4) to implementation of the new idea, and (5) to confirmation of this decision" (p. 161). These five stages describe the types of activities undergone by the individual during the innovation-decision process.

The sensemaking model is a lower-level view, describing the evolution of the adopter's mental framework. At each of Rogers' stages, sensemaking compels the individual to sensible action, causing him to progress through the stages. Therefore, Rogers'

model charts a progression of activities during the adoption process, whereas the sensemaking model explains the adopter's mental mechanics at each stage.

5.1 The Knowledge Stage

In the knowledge stage, an individual is exposed to an innovation's existence and gains some understanding of how it functions. This exposure may have happened by chance, or may have been the result of an effort to seek out the innovation once the individual had identified a need for it.

Need assessment is based on identifications. For example, a manager may identify an employee as someone who needs certain equipment because of his job title and, therefore, requisition that equipment without certainty that the equipment is needed. A "need" for a technology is very often just a plausible assertion that benefit will be gained from a technology.

Knowledge of an innovation is gained by extracting cues from stimuli. The stimuli that the individual encounters are partially a result of the individual's enacted environment. The individual may manage his social contacts and other elements of his environment in such a way as to gain knowledge about a particular innovation or about ways to meet a particular need. As Rogers notes, "Individuals tend to expose themselves to ideas that are in accordance with their interests, needs, and existing attitudes" (p. 164).

5.2 The Persuasion Stage

In the persuasion stage, a favorable or unfavorable attitude toward the innovation is developed. At this stage, the individual seeks "innovation-evaluation information" (Rogers 1995, p. 168) to reduce uncertainty about the innovation's expected consequences. Formation of this attitude is dependent upon the opinions of peers and their experiences with the innovation.

Any knowledge of the innovation must be incorporated into existing mental frameworks. This fact contradicts the idea that attitude formation occurs only after experiencing the technology. Because these mental frameworks contain knowledge of other, possibly similar innovations, the individual is able to have an attitude toward *types* of innovations and toward specific *characteristics* of innovations. These pre-existing attitudes become part of the attitude toward the innovation. For example, if the individual does not like automobiles, or specifically foreign automobiles, formation of an attitude toward a newly announced automobile begins with the existing negative attitude.

Because attitude formation begins before persuasion, information-seeking at the persuasion stage is for justifying, affirming, or modifying the attitude. Therefore, an individual can have an attitude toward an innovation based on very limited information and plausible beliefs. An individual who can only justify his attitude toward an innovation as a "feeling" or a "hunch" is doing so because the attitude formation is based on limited information about the innovation.

If the innovation is desirable, the individual may alter his identification of himself, other people, or objects in his environment in order to justify adoption. For example, an individual who desires a new computer may justify purchase by convincing himself that his old computer is slow, failing, or inadequate. He may also try to convince others that he needs the new computer in order to gain support for it. Similarly, if the innovation is undesirable, then support for rejection will be sought.

5.3 The Decision Stage

In the decision stage, the individual "engages in activities that lead to a choice to adopt or reject an innovation." (Rogers 1995, p. 171) Adoption can be partial or full, probationary or complete. Rejection can be active or passive. Trial adoption can be done vicariously by observing or asking about a peer's adoption experience.

Partial adoption and vicarious trial adoption allow the individual to encounter new stimuli for further adjustment of perceptions of the technology and for understanding how the innovation can be incorporated into the individual's environment. These types of adoption allow for retrospective mental framing before implementation. Trial adoption also allows for the gathering of socially developed information for sensemaking.

The sensemaking model suggests that the individual has been engaging in adoption-related or rejection-related activities all along, and will continue to do so once the decision is made. The decision to adopt or reject involves actions to carry out the decision,

but it is not the end of sensemaking about it. Unless the innovation is passively rejected, sensemaking will be directed toward implementation or toward the consequences of rejection. Once the decision is made, the justification of the decision will then be developed retrospectively.

5.4 The Implementation Stage

In the implementation stage, the adopter puts the innovation into use and seeks technical information for the implementation. If the adopter is also the implementer, then he will encounter the innovation extensively during implementation, acting to incorporate the innovation into his environment while modifying his environment for the innovation and reinventing the technology. Reinvention is simply evolutionary sensemaking (Swanson 1994). As such, reinvention is driven by those influences that drive sensemaking in general, e.g., exposure to new stimuli through environmental changes or social contacts, retrospection, identity construction (e.g., to view one's self as innovative or unconventional), etc.

During implementation, the adopter will extract and incorporate many more cues from his experience with the innovation. His peers may be involved in or may observe the implementation and provide more stimuli for mentally framing the innovation and for constructing his identity. These peers may also be trial adopters of the technology and would, therefore, be extracting informational cues from the implementation during their own decision-stage activities.

5.5 The Confirmation Stage

In the confirmation stage, the individual seeks reinforcement of his adoption or rejection decision. The individual may be motivated by dissonance and may decide to reverse his decision depending on the information he receives.

Having performed a decision-related action and possibly implementation, the individual gathers information to retrospectively assess what he has done and what he should do next, including the possibility of reversing the previous adoption/rejection decision. However, action and retrospection have been happening at every stage of the IDPM according to the sensemaking model. Confirmation is, therefore, an outcome of sensemaking that is occurring constantly throughout all the IDPM stages.

The table below summarizes the sensemaking activities within the IDPM.

Table 1. Sensemaking Activities Within the IDPM

IDPM Stage	Sensemaking
Knowledge	• Need-based identity construction • Search for stimuli to mentally frame technology and adopters
Persuasion	• Reconstruction of identity to support or resist adoption • Plausibility belief construction to frame possible outcomes of adoption or rejection • Seeking of social guidance/reinforcement for adoption decision
Decision	• Actions that can be identifiable as adoption or rejection, leading to enactment of environment • Partial or vicarious trial adoption enables retrospection
Implementation	• Much stimuli from experience with the technology • Reinvention through evolutionary sensemaking
Confirmation	• Action and retrospection lead to confirmation or disconfirmation throughout the IDPM stages

6. CONCLUSION

Having identified many of the factors that influence adoption, it is now important to learn about adoption as a process and to explore the subprocesses that affect perceptions and attitudes. This paper introduced Weick's (1995) description of sensemaking as an adopter-centered model with which to explore behavioral processes related to technology adoption. Seven properties of

sensemaking were discussed with regard to technology adoption. These discussions produced a substantial number of research questions.

The sensemaking model was compared with Rogers' innovation-decision process model, and more briefly with TAM and TPB. Each stage of the IDPM was described in terms of the sensemaking properties. This alignment of sensemaking with IDPM stages can survive alternative stage progressions, e.g., the decision stage preceding the persuasion stage (Rogers 1995).

Exploration of the research questions mentioned must use a variety of methodologies. Survey research and interviews may be sufficient to look at changes in self-identity, changes to mental frameworks from retrospection, and perceptions of plausible impacts of technology usage. A more process-based approach may be necessary to follow the social interactions that affect, and are affected by, interaction with technology. Group conversations surrounding individual and group adoptions may be analyzed for signs of the effects of social interactions and other sensemaking activities. Enactment and the ongoing nature of sensemaking may require longitudinal data or simulations because of the need to investigate environmental and perceptual changes over time. Cue extraction lends itself to experiments and questionnaires, e.g., asking subjects about the details that they notice as they interact with a system and how those details are interpreted.

Although this is the beginning of a behavioral process model of adoption, there is much more to be done. For example, the sensemaking model does not address the very important issues of how behavioral intention is formed and what causes action. Furthermore, little is known about the substantial roles that impulse, habit, emotion, etc. play in the adoption of technologies. Exploration of these issues will yield a very rich, complex adoption model.

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