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Negative Emotion and Seeking Social Support during the Early Stage of System Implementation: A Case Study

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Abstract

Although humans are found to be hardwired for being influenced by referent others from the same social realm (Cialdini and Trost, 1998), our literature review indicates that conventional technology adoption models (such as the Unified Theory of Acceptance and Use of Technology, UTAUT) in Information Systems literature often implicitly assume that user beliefs are independent of what others say or do. Social information and communication are treated as external variables and are not considered directly. Moreover, the picture that these models paint is predominantly cognition-based with little colour of emotion except for Computer Anxiety (Compeau and Higgins, 1995). Although the technology adoption literature does have one research stream on non-instrumental outcomes, such as enjoyment (Davis, Bagozzi and Warshaw, 1992) and flow (Webster, Trevino and Ryan, 1993), its focus is mainly on human-computer interaction (Agarwal, 2000). Emotion-related topics that are ample in the organizational transformation literature are relatively less explored in extant technology adoption literature. The adoption of a new information technology at work invokes a series of changes in work procedures and relationships, which may be a hotbed of negative emotions such as anxiety and powerlessness. We draw on social information processing theory (Salancik and Pfeffer, 1978) and stress and coping theory (Lazarus and Folkman, 1984) to examine how case managers of one non-for-profit health resource coordination institute in Canada could be influenced by one another via seeking social support in order to regain the sense of control and/or to regulate the negative emotion aroused by the coming of a new information technology. Interviews with thirteen case managers were conducted to understand the role of communication in their emotional and behavioural response to the adoption of a new technology. At the end of the paper we propose an alternative conceptual model that incorporates communication and user emotion to enrich the existing understanding of technology acceptance.

Introduction

Social psychology considers humans as social beings hardwired for, consciously or unconsciously, accepting influence by others from the same social environment (Cialdini and Trost, 1998). This is no exception when it comes to employees' technology acceptance in an organization. In his book Everett Rogers depicts a fascinating role for social influence in the process of innovation diffusion. A potential adopter learns about the innovation through social interaction and communication during the knowledge stage and the persuasion stage before finally arriving at a decision (Rogers, 2003). Therefore, technology adoption and implementation in an organization is a period of time during which employees influence and are influenced by one another through social interaction before they are cognitively and emotionally prepared for a new information technology.

Successful implementation of an innovation as part of an organizational change depends on the extent to which information concerning the innovation reaches all employees (DiFonzo and Bordia, 1998; Bordia, Hobman, Jone, Gallois et al., 2004). How to leverage the power of social influence for fostering positive attitude toward the innovation among target technology users has been a recurrent theme for both practitioners and academics. While much emphasis has been placed on the impact of user cognition on behavioural intention (e.g., UTAUT, Venkatesh, Morris, Davis and Davis, 2003), the technology adoption literature is relatively less concerned with how users' initial evaluation of an innovation are shaped before direct, first-hand experience with the innovation is available. Rogers emphasized the effect of contagion through social interaction in the process of innovation diffusion: A typical solar adopter in Rogers's study demonstrated the new equipment to six peers on average (Rogers, 2003). In the context of system implementation in organizations, those who are trialing a new system may be a positive influence on other colleagues' belief of the system. However, communication or social interaction is often deemed external to the core of technology adoption (e.g., Davis, Bagozzi and Warshaw, 1989; Bhattacharjee and Premkumar, 2004). Although UTAUT takes into account social factors, its conceptualization of social influence is primarily normative. Informational social influence such as word of mouth is not considered. Moreover, user emotion toward the innovation in this stream of research is by and large understated, even though emotion is

a precursor to an individual's internalizing the core values and willingness to cooperate in the face of inconvenience (Mossholder, Setton, Armenakis and Harris, 2000).

Deploying both the lens of social information processing (Salancik and Pfeffer, 1978) and Lazarus and Folkman's (1984) stress and coping theory, this manuscript presents a case study in a health care organization where a mission-critical information system was being implemented. The contribution of this study is the synergy from two important perspectives whose mutual dependence has not been sufficiently discussed in the technology adoption literature. Social information processing theory highlights the importance of giving and seeking information in an environment characterized by ambiguity and uncertainty. Meanwhile, stress and coping theory (Lazarus and Folkman, 1984), a theoretical lens used by Beaudry and Pinsonneault (2005) to explain post-implementation adaption, further illuminates employees' emotional response during such ambiguity and uncertainty derived from the coming of a new technology in the workplace.

Literature Review

The most comprehensive literature review of the technology adoption literature to date is the Unified Theory of Acceptance and Use of Technology (UTAUT, Venkatesh, Morris et al., 2003) that integrates eight models and theories of individual technology acceptance—Theory of Reasoned Action (Fishbein and Ajzen, 1975), Technology Acceptance Model (Davis, Bagozzi et al., 1989), Motivational Model, Theory of Planned Behaviour (Ajzen, 1985), Combined TRA and TPB (Taylor and Todd, 1995), Model of PC Utilization (Thompson, Higgins and Howell, 1991), Innovation Diffusion Theory (Rogers, 2003), and Social Cognitive Theory (Bandura, 1986)). In UTAUT, antecedents to behavioural intention are grouped into four categories—Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. As concise the model is in summarizing the relationship between user cognition and behavioural intention, implicitly assumed is the independence between cognition and social influence. In other words, an individual's beliefs about the usage of an innovation are implicitly viewed as self-generated and immune from what others say or do, even though other studies did find user belief subject to social pressure (Venkatesh and Davis, 2000). This implicit assumption runs counter to the broad body of research in social psychology

(e.g., social contagion effect, persuasion, and social learning) in which humans are assumed to be influenced by one another in cognition, emotion, and behaviour. For instance, social information processing theory (Salancik and Pfeffer, 1978) posits that an individual's attitude toward a given object is susceptible to referents' attitude of the same object especially when objective judgment is difficult to come by. During the knowledge stage of innovation diffusion in an organizational setting (Rogers, 2003), employees are likely to be exposed to information about the innovation before they are exposed to the actual artifact. How the initial knowledge about an innovation is formed through social interaction is currently not answered within the scope of UTAUT.

Another implicit assumption prevalent in the technology adoption literature is the dominance of cognition over emotion. Much emphasis has been placed on what an individual thinks about the usage of an innovation—(1) Usefulness (its pragmatic value for enhancing productivity), (2) Ease of Use (how effortless or effortful it is to use), (3) Subjective Norm (the social pressure on the self to use), and (4) Facilitating Conditions (the resources required to put the innovation to use). These cognitive categories together have been helpful for painting a compact picture of an employee's technology adoption in the organization. However, this conceptualization of technology adoption gives little consideration to an employee's emotion regarding to the adoption of an innovation, even though the experience of emotion is an integral part of system implementation. Klein and Sorra (1996) listed a wide range of emotions, from enthusiasm to indifference to resentment, that staff may experience in response to the implementation of a new technology. Viewing the adoption of a new technology as an organizational change, Lewis and Seibold (1996) argue that it inevitably provokes uncertainty and equivocality in procedures, work relationships, and roles, which often leads to negative emotions such as fear and trepidation among employees during this period of time (Miller and Monge, 1985). Positive emotions are assumed to be desirable from a managerial standpoint, and negative emotions call for managerial intervention. On the one hand, lower level management personnel such as line supervisors can positively intervene to help lower employees' stress levels (Lewis, 1999) and facilitate employees' emotional balancing and adaptation during system implementation (Huy, 2002), because line supervisors are much closer for observing emotional and behavioral responses among their subordinates and

can report upwardly concerns on their behalf to initiate necessary adjustment for the implementation. On the other hand, employees can make cognitive and behavioural efforts to handle the demands that tax or exceed their energy and capacity. The transactional model of stress and coping (Lazarus and Folkman, 1984) posits that an individual first assess the nature of an event as either a threat or an opportunity. An opportunity makes the individual feel pleasant, while a threat makes the individual feel unpleasant. The secondary appraisal is concerned with the availability of resource necessary for the individual to avoid the negative consequences associated with the threat. If the individual perceives resource as sufficient to address the stressor, the individual is more likely to cope with the stress by taking direct action (i.e., problem-focused coping) than doing something about the psychological discomfort (i.e., emotion-focused coping), such as distraction, acceptance, and catharsis (Stone and Neale, 1984). Although no single coping strategy is universally effective (Carver and Scheier, 1989), in the stress and coping literature it is acknowledged that exclusive deployment of emotion-focused coping can be maladaptive and detrimental to the individual's well-being when something can be done to mitigate the negative effect of a stressor (Rippetoe and Rogers, 1987; Genco, Ho, Grossi, Dunford et al., 1999).

Beaudry and Pinsonneault's (2005) study was the first one in the technology adoption literature to use stress and coping theory for explaining how users adapt themselves to a new technology at work. They synthesized four specific adaptation strategies during the post-impact period (two years after implementation). It is noteworthy that their four strategies are portrayed as predominantly individualistic and hence imply little social interaction required in the process of adaptation. Our study combines stress and coping theory and social information processing theory to investigate how technology users resolve the uncertainty and equivocality through mobilizing their social support during the knowledge stage (pre-implementation).

Research Site and Research Methods

The main research site for this case study is a non-for-profit health care coordination organization called Health Resource Access Point (HRAP, a pseudonym) in Canada. The demand for quality health care for aging baby boomers and the shortage of nursing and medical professionals collectively constitute a major challenge for policy makers across OECD countries (Hurley, Birch and Eyles, 1995; Butler, 1997; Reinardt,

2000). To achieve a higher level of efficiency in resource allocation and utilization, HRAP was designed to orchestrate services with various partners such as hospitals, long-term care facilities, academic health centers, and family practitioners for a smooth transition for the client from a hospital bed to home. This mission was accomplished by case managers (mainly registered nurses) who spent the majority of their time visiting clients, either in the hospital or in the clients' homes, in order to collect information about their medical needs. Then they would return to their offices and use the information that they had just collected to compose a customized recovery plan for each client.

Given the limited human resources available for service, HRAP was set to undergo a series of organizational changes to enhance the consistency of service across an area approximately of 20,000 square miles. One of the means to achieve this goal was to deploy common information technology tools throughout HRAP offices. As a result, case managers were faced with multiple implementations of information technology-based innovations. All case managers were on their way to using a new web-based, common database system that recorded their clients' medical information. For those who were involved with in-take, the Common In-take Evaluation System (CIES, a pseudonym) was mentioned as a significant change on top of the new common database. In addition, those who worked in hospitals were faced with a new concept called Portable Processing (a pseudonym). This concept was not entirely new to hospital case managers, because they had seen nurses pushing a cart with a computer to the bedside of a patient. Nonetheless, this usage behavior had not been part of their work behavior repertoire. Many of them simply carried a clipboard to jot down the information on a piece of paper in the patient's room and then went back to the office to input the information into the computer. It was new for hospital case managers to input data right in front of the patient.

In this particular context, how their attitude toward an innovation was shaped through social interaction was of interest to the senior management of HRAP. One senior manager recalled years ago how nurses had influenced one another's attitude toward the usage of electronic medical records.

Nurses were the biggest push-back around the use of technology. Years and years ago in the hospital environment when they started talking about technology...“No, no, I will not do that,

because I'll take myself away from the bedside, I won't be able to..." [T]hey put their hand up and said "I'm not gonna do this" so they really did influence that bad behavior... it was almost like that SPIRALING EFFECT (*in a tone of drama*), because people just kept talking about and talking about it.

Data were collected during the first year of the ten-year transformation of HRAP. Interviews with three informants from the leadership team and ten case managers were conducted between May and November 2007. Participants were recruited during three waves of e-mail invitation forwarded by one senior manager. Except for the last three interviews, each interview was conducted after the previous one had been transcribed and coded. This approach allowed the first author to refine the interview protocol and probing tactics. The first author also participated in team meetings and one all-staff meeting to observe the social interaction and information flow in these occasions. Nine of the ten participating case managers were full-time, and two were male. The average organizational tenure is 10.5 years (STDEV = 8.25), with two participants who had joined HRAP less than one year previously. The length of the interviews ranged from 50 to 75 minutes.

Interviews were transcribed verbatim into 169 pages of single-spaced transcripts that were imported into N-Vivo 7 (and later N-Vivo 8) for coding. Categories for coding (or nodes, in N-Vivo's terminology) were in part generated from a literature review in organizational change, such as the antecedents to negative emotions, (Miller and Monge, 1985; Bordia, Hobman et al., 2004; Kiefer, 2005), and coping strategy taxonomy (Stone and Neale, 1984; Folkman, Lazarus, Dunkel-Schetter, DeLongis et al., 1986; Aldwin and Revenson, 1987; Carver and Scheier, 1989). When the quotes clustered under one node no longer shared a common theme, child-nodes were then created to hold quotes that were coherent within, and distinctive between, each group. For example, a parent node labeled *the Unknown* was created because nine interviewees mentioned or discussed the sense of being (or not being) kept in the dark. Therefore, any quote that indicated this feeling of not knowing what was going on was coded to this broad category. However, as the number of quotes increased, nuances started to take shape. Some quotes indicated the absence of information concerning the integration of the innovation with existing platforms and the potential duplication of data input (which is detrimental for productivity), while other quotes conveyed the longing to know more about

the time table of implementation progress. To accommodate these differences, we created *How* and *When*, respectively, as sub-categories under *the Unknown*. By the end of this iterative coding process, nine node trees and thirty free nodes were identified as part of a larger study.

Analysis

Throughout the coding process, the following question was addressed: how does an individual get to know about a new information technology that is to be implemented in the workplace during the knowledge stage? This question deals with the formation of an individual's belief about the innovation before any hands-on experience is available. One way to conceptualize this process of belief formation is to view an individual's understanding of a new technology as constructed based on information obtained through social interaction and communication (Nelson and Coopridge, 1996; Weenig, 1999; Jimmieson, Terry and Callan, 2004; Lewis, 2006). In HRAP, a case manager's information source can be grouped into two groups, higher-up and peers. Higher-up refers to authority figures such as top management and immediate supervisor who may exercise legitimate power, reward power, or even coercive power over case managers (French and Raven, 1960). Peer refers to those who do not have authority over one another in the same social environment. Although peers do not have authority over one another, they can be influential by exerting referent power or expert power over their peers (French and Raven, 1960). The next section discusses how information concerning a new technology from the higher-up and peers in HRAP contributed to case managers' feelings toward the innovation.

Input from the Higher-Up and Peers

To reach out to case managers scattered in a geographically vast area, management heavily relied on *en masse* communication enabled by information technology such as e-mails, voice mails, newsletters, and bulletins on the Intranet. Text-based broadcasting such as e-mails with attachment files and Intranet announcements were meant to keep case managers up-to-date. On top of the computer-mediated communication, a monthly meeting was scheduled for team members to meet face-to-face with one another and with middle management. The team meeting was consistently mentioned as one major source for case

managers to receive official information about the coming of new technologies. Case managers could also express their concerns to management in these occasions. The other avenue was ad hoc information sessions that were called when a specific issue was to be announced and explained. Despite the seemingly strategic deployment of face-to-face communication and mass communication tools for management to provide information, eight of the ten participants (#1, #2, #3, #5, #6, #7, #8, #10) found themselves and/or others not knowing much about the new information technologies that were to be implemented. One salient theme across several transcripts is the feeling of being ill-informed of the innovation that was going to affect their work life and negative emotion (e.g., anxiety, anger, suspense) toward the innovation, as shown in the following quote.

[T]he information [concerning the innovation is] just coming in dribs and drabs, nothing clear. So, it's hard for us to buy into that, because we don't really know what we are dealing with here. We see a lot of problems with it, but nobody is informing us how we're gonna work out those problems. So we are not kind of buying into it there. So you'll see a lot of people say that they are afraid of the [innovation] for that reason. (Interviewee #6)

According to the organizational transformation literature, line supervisors are instrumental for emotional balancing and adaptation during organizational transformation (Lewis, 1999; Huy, 2002). However, this scenario did not work out well in HRAP, because even the structure of line management was being drastically changed. Positions of line supervisors were being filled by new faces, and as such a strong trusting relationship was still being developed between them and their subordinates. In addition, supervisors were on rotation among several locations. Therefore, case managers felt that they were often left with their own device in various situations.

The manager that we have now, she is trying to come out sort of once a month for a couple of hours just to be here on site so if there is any issue we need help trouble shooting. So that will be helpful. But I do find that...it's somewhat difficult to access manager if you need it. So you end up doing a lot of problem solving on your own (*waning voice*). (Interviewee #8)

Not only did case managers receive little relevant information from higher-ups to aid in making sense of the coming of a new information technology, but they also heard little word-of-mouth (WOM) from their peers who were trying out the new technology. In the participant's words, "It's very much off the radar". It was unclear whether the trialing case managers were not passing word-of-mouth around, or the interviewee

happened to be in a location where the word-of-mouth simply could not reach him or her due to the geographic distance.

[T]he people that I'm around in the hospital NEVER [*in original emphasis*] hear the experience of that person [who is piloting the system]...[We] are not hearing from people who are trialing it what that experience is like. I would have thought there would be a lot more "Oh you're really gonna like this". That might be helpful only because I think those people are...keen to try it. [Meanwhile,] you wouldn't want the information shared if it was a negative experience. [But] I'm hoping that it's...good [experience], or at least people [could] hear from that person that their concerns and challenges are being addressed and listened to. So, it's very much off the radar...Well maybe it's just an expression of having an organization that functions geographically in different areas (*light chuckles*)...we wouldn't necessarily informally hear anything because we wouldn't be around them. I guess that's one of the reasons. (Interviewee #10)

Summarizing the things that case managers did not know but wanted to know about a new information technology that would be central to their job, this study delineates three broad categories of information--(1) WHY a new information technology had to be deployed, (2) HOW the new information technology would affect their work life, and (3) WHEN such impact would be materialized. The three pillars overlap with the technological frame identified in Orlikowski and Gash's (1994) study of employees' assumptions, expectation, and knowledge of Lotus Notes. While their study emphasizes on *what* employees believed the new technology was, in this study the "what" was integrated into *how* the technology affects work life. This study also adds the need to manage the uncertainty from "when". The following paragraphs illustrates how missing one or more pillars relates to negative emotions.

Pillar One—WHY

Internalizing an influence attempt requires a convincing rationale. Without explanation or justification, an influence attempt is but pressure for behavioral conformity. Two participants (interviewee #5, #6) expressed their quest for reasons that justify the adoption. In the following quote the participant was questioning the rationale behind switching from an older system (BMOS, a pseudonym) to another system TPC (a pseudonym) which was also on its way to being replaced a few years down the road. In the participant's words, "It doesn't make any sense to me." The why questions point to the need for some rationale behind the way things were. Providing rationale might be a solution to not knowing why a new

information technology must be implemented or why the technology is the way it is. Otherwise, employees may be left with a sense of powerlessness and resentment, as evident in the following quote.

[A]pparently we're gonna ask WHY [*in original emphasis*], why switch us [from BMOS] to TPC and then we have to switch to the new version [of TPC]? Why can't we just keep the [BMOS] now without generating more stress? It could be fine. We don't know at this point... I can't see [the] value [of doing so]...It doesn't make any sense to me. I'm just a little worker bee... [It's] okay if [TPC] is working really good [elsewhere]. That's great. But...what we have [here] is really good. So why go through ALL those changes, ALL these details? That's sort of disrespecting the people working here, putting in a whole another level of change on us (Interviewee #5)

Pillar Two—HOW

In the organizational behavior literature, ongoing organizational changes tend to trigger uncertainty in three emotion-charged categories: (1) working conditions (e.g., workload and the ability to act professionally), (2) personal status and future in the company (e.g., job security and relocation), and (3) organizational treatment (e.g., fairness and acknowledgement from the management) (Kiefer, 2005). When information concerning these aspects is inadequate, employees may experience negative emotions. The term HOW is used here to broadly refer to how a new technology relates to target employee in these aspects. Seven participating case managers (Interviewee #1, #2, #3, #6, #7, #8, and #10) mentioned a desire that they and/or their peers wanted to understand the way in which the adoption of a new technology would affect them, and the anxiety induced by the lack of information in this regard.

[Working conditions]

Participants expressed ambiguity in future working conditions when the new technology went live. In the following quote the participant could not visualize how Portable Processing could possibly be implemented in his or her unique work setting. Due to the impediments in the environment, the individual could not perform the behavior in question even if she was willing to do so.

We know it's kind of tickie box thing, and we had a glance of what it was like, but we don't really know how it's gonna impact us. ... [T]he extent of the hospital, it's a whole city block, I don't know how I could be pushing a computer on wheels to run this when you're going up and down on elevators...And I carry dressings. So, how am I going to be hooking the dressing bags on a computer on wheels? I've seen how [nurses] run around [with a computer on a cart], but then they don't have the fanatic pace [as] I do...A lot of patients...are in isolation, and I don't know how you would manage to keep something in if you have to wash your hands and

gown. How can you do that with a laptop? So there are a lot of questions about that. I don't know how they are gonna work it out. (Interviewee #6)

The participant was able to give a compact description of what the new technology was like, but this level of understanding did not seem sufficient to feel informed. Being able to foresee how the actual usage of a new technology could be incorporated into the work environment (i.e., perceived behavioural control) was more important, because she was the front line employees who would operate the system in order to accomplish their day-to-day tasks. Preliminary description of the functionality of a new information technology alone was barely informative.

Other participants mentioned their concerns for how compatible a new technology would be with their work style. It was common practice for case managers to collect information by taking notes with pen and paper when they interacted with clients. While some case managers were simply not comfortable with live data entry due to computer anxiety, others believed that operating a computer and interviewing a client simultaneously was not respectful and would degrade the quality of their service. Moreover, paper tools allowed multi-tasking while the electronic version would require a linear approach to managing their work progress. Given the unknown in how the working conditions would be like, apprehension among peers was observed by the participant as shown in the following quote.

[T]his tool demands that every area be completed. When we used to have paper tools, you could have six assessments going on at the same time and paper copy partially completed. And you were able to complete them on the run and then throw them to the team assistant's box when you were finished. The electronic tools require completion and sign off and sitting in front of a computer and having access to a computer in order to do that. And currently in hospital we don't have a portable system. WRITING was the portable system (*light chuckles*)...So people have a certain apprehension I think, about those early days when it can be quite chaotic. (Interviewee #10)

Finally, the concern for negative impact on productivity was explicitly raised by Interviewee #3, #8, and #10. According to their experience with multiple adoptions in HRAP, they remembered how tedious duplication of data input was imposed on them due to the absence of integration or incompatibility between existing tools and the new one. Therefore, these participants were worried that history would repeat itself. In participant #8's words, "there is that unknown that can get frustrating".

I'm all for using [the new technology]. I don't have a problem using it. I just...don't like to have to work it twice. I don't have the time to do it once these days (*big chuckles*). I don't want to document everything twice...[W]hen we hear information about [the coming of the new technology], [we] just [made] the same sort of comment like "I hope we are not gonna have to document everything twice," "Does that mean we put it on this format and we put it on this format, we put it here and we put it there (*chuckles*)"... "How many different places do we need to document the same data?" "Who's gonna be responsible for updating what part of it?"...This hospital site for instance does not have any team assistant...So for us, it's like (*sigh*). Not only is that gonna be another assessment tool but, how much of that are we gonna own that could be done by clerical support so [that] we can spend more time with clients. So there is that unknown that can get frustrating... (Interviewee #8)

[Organizational treatment]

Kiefer (2005) claimed that in times of ongoing organizational changes, management is more likely to be evaluated by their employees in terms of fairness, acknowledgement, appreciation, and support. Participants' concern for organizational treatment corresponds to Joshi's (1991) equity-implementation model that predicts an individual's response to change based on the fairness of the exchange relationship. This tendency was observed in this case study as well. One participant consciously sought management's acknowledgement and understanding when he or she processed the official information concerning the new technology.

We want our higher-ups to say "Yes, we know that it's gonna be a problem to carry this laptop and all your supplies and go into a room. And we know a lot of you are more comfortable with writing, or just doing it off your head. And a lot of you don't like tickie box 'cause it's like Oh you have to PUT them into a category, instead of doing more anecdotal stuff". [But] we are not hearing that. So, you know, that's why a lot of people are saying "What is this CIES? Why?" [T]here's a lot of questions we have about it. We don't feel they are being answered. (Interviewee #6)

In brief, participants expressed their needs to know *how* the innovation impacted their work life in terms of future working conditions and the fairness of organizational treatment. In the absence of information in this regard, participants mentioned anxiety, worry, and frustration. Perhaps due to the difficulty in recruitment and employee retention in HRAP, personal status (e.g., job insecurity) did not emerge to be a concern.

Pillar Three—WHEN

The expectation in terms of timing was critical to a sense of being informed. That is, case managers wanted to know when the impact of a new information technology would be materialized. Five participating

case managers (Interviewee #1, #2, #5, #7, #8) commented on the tendency for management to make an announcement of the date for a certain implementation activity and then subsequently postpone it without giving an explanation. This made some of them feel like they were “being kept in the dark” (Interviewee #1 and #8). Without a temporal sense of how the implementation activities were to be laid out, employees could experience anxiety as a result of lacking a sense of control. The following quote indicates the ambiguous information concerning when a new technology would arrive, and concomitant feeling of suspense.

[I]here hasn't been a lot of information that we receive really, in terms of clarity on it. We're still kind of waiting. (*chuckles*) The only thing I know that, when I first started here, they were talking about it being rolled out, and that was over a year ago. So, there's been talk and there's been talk and then it was supposed to roll out and then it got postponed. I think they even had set another date to start and then they got postponed again....[W]e saw a brief outline of it probably six months ago in one of our team meetings,...but there wasn't a specific roll out date. They tend to wait before we have all the information... I find anyway with this organization, we do tend to sort of wait until the last minute almost and then it rolls out (Interviewee #8)

Summary of Analysis

The absence of high quality information concerning the WHY, the HOW, and the WHEN of a new information technology seemed to contribute to employees' negative emotion toward the new technology. HOW-related information concerning the adoption of a new technology was the type of information that was most frequently mentioned (by seven interviewees), followed by WHEN (five interviewees) and WHY (2 interviewees). Participants' emphasis on HOW in part confirms the conventional technology adoption models that are mainly concerned with pragmatic purposes of using an innovation at work and their ability to use the innovation. What is relatively less considered in these conventional models is employees' assessment of how adequately and fairly they are treated by the organization. Missing this element may contribute to anger toward the innovation, a direct result of being treated unfairly (Joshi, 1991; Kiefer, 2005). Interestingly, each pillar seems to be associated with a different emotion. Participants who felt ill-informed in the WHY aspect expressed powerlessness toward the arrival of a new technology. Those who did not know much about their future working condition (one element of HOW) expressed anxiety. Those who felt ill-informed with WHEN expressed the feeling of suspense. Overall, the uncertainty could pose a threat to employees' well-being by provoking feelings of lack of control (Bordia, Hobman et al., 2004).

This analysis shows the importance of emotions of the intended adopters of the innovation, and the relationship between social information and these emotions. We now turn to an analysis of how case managers sought further information from their social world to regain the sense of control and to regulate their negative emotion.

Coping—Seeking Social Support

Various coping behaviours for case managers to deal with the negative emotion aroused by the unknown were mentioned during the interviews, such as acceptance and situation redefinition (Stone and Neale, 1984; Folkman, Lazarus et al., 1986). Among all coping strategies, one strategy that is of particular interest to this case study is Seeking Social Support, because it fits Lamb and Kling's (2003) conceptualization of users as social actors. Investigating employees' seeking social support is consistent with their call for asking "with whom an actor is interacting, about what issues, under what conditions, for what ends, with what resources, etc." (p. 224). The deployment of Seeking Social Support is also consistent with the prediction made by social information processing theory (Salancik and Pfeffer, 1978): an individual counts on other individuals to interpret cues to make sense of the environment in the face of uncertainty and ambiguity. Stress and coping theory posits that an individual may seek empathy and moral support from others just to feel better, or that an individual may draw from his or her social fund and obtain from the social network relevant resources (e.g., relevant information concerning a new information technology in this context) (Carver and Scheier, 1989; Thoits, 1995). Thus, seeking social support can be used as either emotion-focused or problem-focused coping, depending on the object being sought by the focal individual. When the object being sought is relevant information, the information seeking behaviour can reduce uncertainty, restore the sense of clarity, and assert control over the work environment (Bordia, Hobman et al., 2004).

Despite its dual effect, seeking social support as a coping strategy can be difficult to implement when isolation is perceived to be one feature of the work environment. Seven participants (Interviewee #1, #2, #4, #5, #6, #8, #9) mentioned their feeling of isolation at work for various reasons. Compared with conventional employees who work in the same building for 35 hours a week, HRAP's case managers generally had much less opportunity to co-exist with colleagues in the same space. Case managers were out of

the office at least 75% of the time, because a main part of the job was to visit clients. In addition, satellite offices in rural communities were a smaller social sphere than urban ones. Therefore, the opportunity for case managers to be socially engaged with one another was limited. Finally, the organizational transformation necessitated some case managers to move to a different location, rendering these case managers “new kids on the block” (in the words of Interviewee #5). In the absence of mutual history and camaraderie, it could be more difficult for these case managers to mobilize instrumental or emotional support from colleagues whom they did not know well. Nonetheless, participants described their conscious efforts to seek social support in order to build their understanding of a new technology and to cope with the negative emotion derived from not knowing enough about it. The following paragraphs present how case managers made efforts to engage socially with peers in order to cope with the stress from the coming of a new technology.

Given isolation as a common feature of the work environment in HRAP, some participants made the most out of the limited opportunity for social interaction, such as swift conversation in the corridor, debriefing over coffee after a team meeting, or spontaneous lunch whenever possible. In these informal occasions, work-related information was voluntarily and casually woven into conversations for participants to brainstorm, clarify doubts, find out other people’s opinions, reaffirm established understanding of the situation, or simply feel assured that they were not alone. One participant talked about seeking social support from team members in the form of daily short chit-chat for sense making in a small group setting:

[T]hey show up in my doorway or I show up in their doorway, and someone says “Oh did you see that e-mail?” or “Did you see the agenda for the next meeting?” or something like that, or “Has anybody heard anything?” just stuff like that. And we just talk because there’s been a lot of changes since last year, with the [organizational transformation] that happened, just keeping up with the changes is almost a full time job, seriously. I think that’s why we end up chatting too, is just to try to figure it out. [S]omeone will say “Oh when I read that, I thought it meant...”, and you’ll say “Oh, I never thought of that”. So it helps you work it out. Some men maybe, but I know that a lot of women feel better when they bounce things off each other...[I]t’s one thing to read on the e-mail, but just because you’ve read the memo doesn’t mean you get it. (Interviewee #4)

Some participants sought support from old acquaintances with whom they had previously worked. Case managers who had a higher level of seniority usually had switched locations and roles. So they tended to have a bigger and more diversified social network than new ones who strove just to know others and to be

known. The following quote was from a seasoned case manager who made efforts to reconnect to old colleagues outside work hours and to discuss *how* to implement Portable Processing at work. In addition to brainstorming, the discussion also served as a way for the participant to freely express feelings, which is consistent with Carver, Scheier, and Weintraub's (1989) observation that in everyday life seeking social resource for both problem solving and emotion support can co-occur.

[T]here is a bunch of us that go out to dinner...Everybody gets to pick a restaurant when we go out. We try different types of food. And it's just chance to touch base with each other, because we never see each other. We come from different departments. And [Portable Processing] is one thing we've talked about a lot. [W]e are just trying to figure out how you can carry this laptop and interview the patient at the same time... So when I go out to dinners, here is the chance to say what I feel without being judged. (Interviewee #6)

When face-to-face gatherings were unnecessary or too effortful, communication technologies such as telephones and e-mails were then used for information exchange. In the following quote, the case manager e-mailed an old colleague from a different unit in order to obtain first-hand information of usage experience and to infer *when* the new technology would be rolled out in her unit. Through this simple action of initiating a textual conversation about a new technology, relevant information that was otherwise unavailable accrued to the interviewee.

I just e-mailed her and said "Did you guys attend the CIES training?" and she e-mailed back and said yes. So that tells me that maybe they are finally starting the actual implementation...I hadn't managed to get much more [information] than that. I have been so busy [that] I haven't e-mailed her back (*big chuckles*) for more information but I will. I'll be like "Tell me more about it! When is it coming to the rest of us?" (Interviewee #8)

This section has presented instances where case managers, in the midst of uncertainty and ambiguity rising from the implementation of a new information technology, mobilized their social resource in order to obtain relevant information concerning the new technology and regain a sense of control, and/or to regulate negative emotions by expressing their feeling in a safe, informal environment. Seven interviewees (#1, #2, #4, #5, #6, #8, #9) sought social support for problem-solving while only two (#1 and #6) explicitly mentioned their quest for emotional support from others. This prevalence deployment of problem-focused social support seeking among the participants is consistent with Terry's (1994) observation that work-related

stressors tend to be dealt with problem-focused coping, while interpersonal stressors are more often addressed with emotion-focused coping.

Discussion

This case study expands the scope of existing technology acceptance models in two directions. First, this study investigates employees' attitude formation in the knowledge stage of technology adoption when employees process both formal and informal information concerning the innovation. The process of forming attitude and belief toward a new technology is social in nature; it involves tremendous information processing and sense making during the knowledge stage of innovation diffusion. Employees' beliefs about the innovation in this stage, while preliminary and malleable, are the foundation of their beliefs in the next stage. By examining the types of information that were (or were not) assimilated to case managers in HRAP, this study found that participants' need for supportive and fair treatment from the organization was no less important than their pragmatic analysis on the consequences of adopting a new technology.

Secondly, this study explicitly takes into account the role of emotion during system implementation. As predicted by stress and coping theory, the appraisal of the coming a new innovation triggers some emotion, be it suspense, powerlessness, or fear. The consideration of employees' emotion towards the new technology is a missing piece from the predominantly cognition-based conceptualization of technology acceptance in the IS literature. We showcased how employees can mobilize their social resources as a way to cope with the stressor of lacking relevant information concerning the adoption of a new technology during the early stage of system implementation. More importantly, this very act of going to another individual to talk about the coming of an information technology is a new pebble tossed into the pond of social information for others to process (see the feedback loop in Figure 1). Researchers who are interested in further developing technology acceptance theories may consider opening the black box of "external variables" and take into account the effect of communication and social interaction on technology users' cognition and emotion to construct a richer conceptualization of technology acceptance.

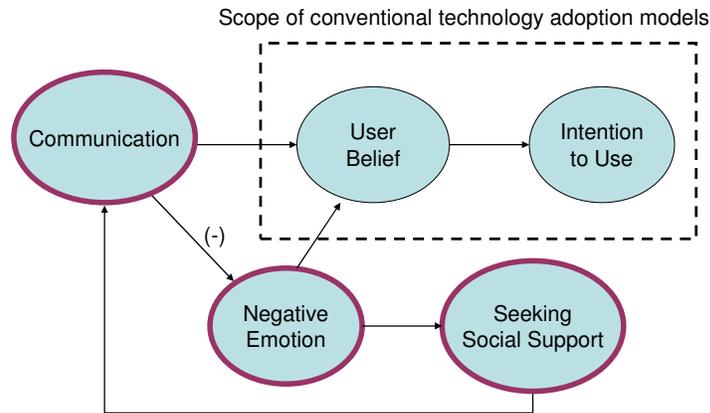


Figure 1—Expanding the scope of technology adoption models

Nonetheless, this case study is based on thirteen interviews from one organization in the health care industry during its first year of the ten-year organizational transformation process. The negative emotions and the stress level observed among participants may not be representative of potential users from another organization which is not going through drastic change at multiple levels. Findings should be taken with caution.

Managerial Implications

While it is tempting for managers to believe that they have kept potential users in the loop by providing general, factual descriptions of a new technology, what employees are more keen to find out is the rationale behind the choice made on their behalf (why), the consequences of using the innovation at the personal level (how), and the timeline for various implementation activities (when). Without providing information in these aspects, employees may feel frustrated and anxious toward the innovation. DiFonzo and Bordia (1998) mentioned managers' desire to give out only accurate information and the dilemma of whether to reveal or to conceal during organizational changes. Their advice was to err on the side of revealing too much and too early than too little and too late. Otherwise, "employees, facing anxiety and uncertainty regarding issues of high relevance to them, may then conjure scenarios that are often worse than reality." (p. 299) Instead of waiting until a finite answer is available to announce officially, management should include intermediary information in the update (DiFonzo and Bordia, 1998), because any information is better than

no information at all, especially when delay is involved (Miller and Monge, 1985; Miller, Johnson and Grau, 1994).

Another avenue for facilitating user adaptation through social interaction is to facilitate social encounters for employees. In HRAP case managers counted on one another to make sense of the decision to implement a certain technology, a decision that had been made by management on their behalf, in order to cognitively and emotionally prepare themselves for using the technology when it goes live. Opportunities for social interaction are a double-edged sword, because both positive and negative word-of-mouth may occur. While positive comments are desirable from the managerial standpoint, they cannot be demanded. On the contrary, dissatisfied customers are more likely to pass negative word-of-mouth, compared to their counterparts (Anderson, 1998). There is little that management can do to control what is said informally among employees. Yet without authentic word-of-mouth going around, the innovation may be off employees' radar, which is also an undesirable scenario. Our case study shows that during social encounters employees can give and receive information that is relevant to their specific work environment (versus generic information passing down from management) and develop realistic understanding of the usage of an innovation. Moreover, moral support can be exchanged, and bonding strengthened accordingly, which is important for alleviating occupational stress during a time of change.

Conclusion

This case study shows how HRAP's case managers communicated with one another to gather more information about a new information technology and to regulate negative emotion from not knowing much about the technology. Case managers sourced their own information by direct enquiry with peers during scarce face-to-face encounters at work, or even sparked additional social gatherings outside work hours. They e-mailed or called someone to get the first-hand insider information. These informal communication activities form a highway for information that complements with official campaign and education for case managers to make sense of the coming of a new information technology. This finding sheds new light on the development of user acceptance in the early stage of system implementation.

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