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UNDERSTANDING PRIMARY APPRAISAL IN USER ADOPTION: AN EXPLORATORY CASE STUDY OF A TELEHEALTH PROJECT

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ABSTRACT

Implementation of a new system typically results in significant change for users' work processes who engage in adaptation processes to cope with the change. Coping theory explains how people choose adaptation behaviors after a series of appraisal processes. Primary appraisal results in the categorization of the IT artifact as a threat or an opportunity. Understanding these primary appraisals, specifically what antecedents produce various appraisal results, allows better prediction of user behaviors and ultimately of implementation success. Drawing on observations during a case study of a telehealth pilot project in six sites, we offer a theoretical model to better understand the antecedents of primary appraisal.

Keywords

Coping, Appraisal, User Adaptation, Telehealth, Telemedicine

INTRODUCTION

A key component to the success of any situation that utilizes an IT artifact is the adoption of that artifact by the necessary users. The literature is ripe with streams of research attempting to understand the many facets involved in implementation success. Venkatesh et al. (2003) identify numerous variance models of user acceptance, including the technology acceptance model / unified theory of acceptance and use of technology (TAM/UTAUT) (Davis 1989), Theory of Planned Behavior (TPB) (Taylor & Todd 1995), and the Innovation Diffusion Theory (IDT) (Rogers 2003). As such, previous research has provided considerable insights into aspects of user adoption.

Beaudry and Pinsonneault (2005) provide a different theoretical lens by proposing the coping model of user adaptation (CMUA.) By understanding that the new information technology constitutes a disruption to organizations, user adaptation can be viewed as coping (Beaudry & Pinsonneault 2005). The process of implementing a new information technology is fraught with questions about how the new artifact will fit into the existing process, what resources will be involved in the addition, which people will be performing which roles, etc. CMUA builds upon Lazarus and Folkman's (1984) coping and appraisal model and applies it to a situation where the new information technology represents the stressor to be handled. Through a coping process, each user evaluates the situation through a series of cognitive appraisals and the outcomes of these appraisals determine the behaviors the user will engage in towards the implementation (Beaudry & Pinsonneault 2005). Understanding these appraisals, specifically what antecedents produce various appraisal results, allows better prediction of user behaviors and ultimately of implementation success.

The coping perspective provides a useful framework via which to examine adoption. Much is still unknown about how users make their appraisals of the situation during the coping process and the consequences of such appraisals. Lazarus and Folkman (1984) separate the appraisal process into primary and secondary pieces, and suggest the primary appraisal judges the stressor as a threat or an opportunity. They go on to suggest that a positive primary appraisal, a view that the impending change is an opportunity, leads to a higher quality of functioning and ability to draw upon and utilize resources than a negative appraisal. The benefits to understanding, and ultimately helping control primary appraisal, are high to businesses as they implement new IS projects. This study develops a theoretical model that integrates the work done so far in the coping arena with observations during a case study of a telehealth initiative to understand the antecedents to the users' primary appraisal of a new information technology implementation.

The theoretical contribution of this paper is the development of a model with the factors assessed in primary appraisal of a new IT artifact. It begins by discussing the theoretical background of coping and the appraisal process. Next it describes the study of a telehealth initiative in rural nursing homes and offers preliminary findings that support or refine my primary appraisal model. We conclude with a brief discussion about the importance of further research and understanding of the components of the coping process for the area of user adoption.

THEORETICAL BACKGROUND

Coping

Coping is defined as "the cognitive and behavioral efforts exerted to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman 1984 p. 141). Cognitive efforts

involve distancing, escaping, acceptance, or other methods of altering the subjective meaning, while behavioral efforts include changing the situation (Folkman et al. 1986). In other words, coping is the process a subject takes in order to respond to a stressor that enters their environment. Beaudry and Pinsonneault (2005) explain coping as a response to a disruptive event that occurs in his or her environment (e.g., a new technology implementation.)

Appraisals

Appraisals are cognitive evaluations of the encounter, as the user categorizes the stressor (i.e., new IT implementation) and its various facets with respect to the user's well-being (Lazarus & Folkman 1984; Beaudry & Pinsonneault 2005). Folkman and Lazarus (1988) go on to explain that the cognitive appraisal process mediates reactions and that each user will appraise a situation differently. They identify two types of appraisals that are of interest when studying the coping process: primary appraisals and secondary appraisals.

Primary Appraisal

Primary appraisal is a user's assessment of the personal importance and relevance of the situation (Lazarus & Folkman 1984). The questions center around, "What is at stake for me in this situation?" (Beaudry & Pinsonneault 2005). There are two possible outcomes of the primary appraisal process: challenge or threat (Lazarus & Folkman 1984). Challenge refers to a situation that has been assessed as having positive outcomes for the user, and invokes emotions of excitement and anticipation. Some streams of literature refer to this outcome as an opportunity. To match the existing CMUA terminology and to avoid further confusion, we refer to this assessment as opportunity. Threats refer to a situation where loss or harm is anticipated and is categorized by emotions of fear, anger, and anxiety (Lazarus & Folkman 1984).

Secondary Appraisal

Users also undergo a second appraisal process, where resources are assessed that might allow management of the situation (Folkman et al. 1986). This is a complex process that takes into account coping options as well as their likelihood of accomplishing the desired results (Lazarus & Folkman 1984). In essence, this appraisal centers around the question of, "What is to be done about this situation?" Beaudry and Pinsonneault (2005) further explain that in the context of IT, secondary appraisal includes the components of work, self, and technology. Work control refers to the feeling of sufficient autonomy in regards to their job and ability to modify tasks, self control involves the users' belief they can adapt themselves to the new environment, and technology control refers to the ability to manipulate features and functionalities of the new IT (Beaudry & Pinsonneault 2005).

Dynamic Properties of Appraisal – Reappraisal and Triggers

Lazarus and Folkman (1984) express some regret of the primary and secondary construct names, because these appraisals are dynamic in nature and not necessarily sequential in the coping process. Additionally, triggers in the user environment cause reappraisals of the situation, through updated primary and secondary appraisal mechanisms. Beaudry and Pinsonneault (2005) involve triggers in their CMUA development and suggest the adaptive behaviors (determined by initial primary and secondary appraisals) will result in a modified situation needing additional appraisals.

Appraisal Results: Adaptation Behaviors

Inside the coping process, the appraisal (and reappraisal) processes result in the selection of adaptation behaviors (Lazarus & Folkman 1984; Beaudry & Pinsonneault 2005). These adaptation behaviors directly affect implementation success. The resulting behaviors generally fall into either problem or emotion-focused coping solutions (Latack & Havlovic 1992). Beaudry and Pinsonneault (2005) define four adaptation behaviors inside CMUA, ensuing from the combination of the primary appraisal result (opportunity or threat) with the secondary appraisal (user control of the IS implementation). Benefit maximizing and benefit satisficing were derived from different secondary appraisals in conjunction with a primary appraisal as an opportunity, and resulted in individual efficiency and effectiveness pertaining to the IT implementation. Situations involving a primary appraisal result of threat included adaptation behaviors involving disturbance handling and self-preservation, and resulted in a variety of outcomes including failure (user exited the situation) and minimization of negative consequences (grudging acceptance.)

In another interpretation and categorization of adaptation behaviors, Piderit (2000) analyzes the research surrounding resistance as a response to change, and explains the complexity of both the dimensions (emotional, cognitive, and behavioral) and resulting combinations of user assessments. Appreciating the multidimensional aspect of appraisals, she calls on more research to interpret exit, voice, loyalty, and neglect as components of resistance which partly overlap with the adaptation behaviors described above. Only by understanding the coping process in greater detail will we be able to comprehend, predict, and influence the resulting adaptation behaviors and increase the probability of successful IS implementations.

The Coping-Adaptation model is shown in figure 1 as a pictorial representation of the framework described above, heavily influenced by Lazarus and Folkman (1984).

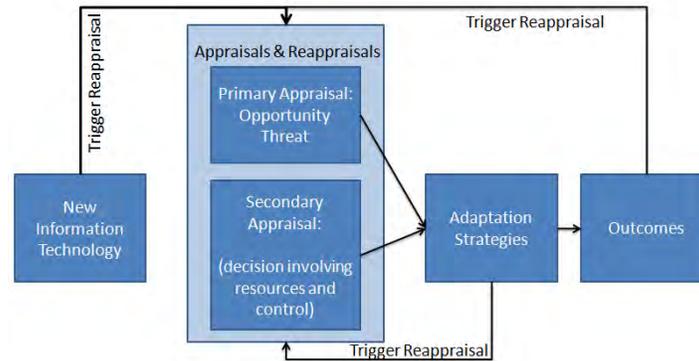


Figure 1. Coping-Adaptation Model

METHODOLOGY

Within this broader framework of coping-adaptation processes, my interest is in identifying determinants of primary appraisals. That is, what factors influence a user's primary appraisal of a technology as a threat or an opportunity? To provide insights into this research question, we conducted a series of exploratory case studies. Case studies are an appropriate method to examine the phenomenon because there is little understanding of the primary appraisal process. Interviews allow us the freedom to investigate users' beliefs and reactions surrounding the IT artifact and the intimacy of a case study allows us the focus to understand the nuances of the situation.

The context of the study is telehealth implementation in six rural nursing homes which have implemented or are in the process of implementing the technology. Use of the telemedicine unit is not mandated. As such, there is wide variation in the use of the telemedicine technology across the sites reflecting differing primary appraisals of the technology by stakeholders. This provides us with an excellent opportunity to gain insights into primary appraisals of the same technology in the same organizational context and the factors that lead to different outcomes.

Case Study Context

All six nursing homes are in rural areas and belong to the same parent organization. They have all been directed by the parent organization to implement telehealth units. Patient access to physicians (primary care, specialists, and emergency room) in rural areas is limited. Further, transporting the elderly to physicians or hospitals many miles away is inconvenient for the patients, costly, and may result in transport injuries. These factors formed the primary motivation for implementing these units in the nursing homes. All units are provided by the same not-for-profit organization that provides both the technology as well as the training to these sites.

Bashshur (1995) defines telemedicine as "a system of care that uses telecommunications and computer technology to substitute for face-to-face interaction between patients, physicians, and/or non-physician providers in various combinations." The nursing homes are voluntarily using the telehealth units to connect to a well-known state hospital for patient emergency diagnosis, access to specialists that may not be able to visit their rural facility, and to connect with local attending physicians in their offices. Nurses and nursing home staff use a stationary presenting telehealth unit (a computer, with two monitors, speakers, a camera, and several medical scope peripherals) to connect to a physician at another site to conduct a medical consultation on the patient.

Data Collection

To date, 25 interviews have been conducted and the average interview lasted around an hour (detailed in Table 1.) The approximate interviewee participation time was 25 hrs and 33 minutes, and some stakeholders were interviewed multiple times. With one exception (permission to tape was denied due to unforeseen circumstances that had nothing to do with the interview), the interviews were audio recorded and transcribed. All subjects were assured confidentiality. The people interviewed were involved in the nursing home telehealth project at various stages of the implementation process, and had varying degrees of success with the voluntary usage of the telehealth units, with one nursing home discontinuing use. Details on the nursing homes are provided in Table 2. Each interview consisted of open-ended questions designed to better understand the appraisal process of the interview subject, as well as additional details about the telehealth implementation and reactions of other stakeholders.

Title and Position Description	Number of Interview Subjects (approximate time)
Nursing Home Administrators – The top administrator at each nursing home facility	6 (6:21)
Director of Nursing – The head nurse at each nursing home facility	5 (5:40)
Additional Nurses & Support Staff – Other nurses or counselors knowledgeable about the telehealth unit	4 (2:41)
Nursing Home Parent Company Administrator – Senior administrator of the parent organization that owns all nursing homes in the pilot project and is heavily involved with site selection for the telehealth project	1 (1:39)
Attending Physicians – Each is the medical director and heavily involved with multiple nursing homes in the pilot project	2 (4:22)
ER Physician – Primary contact at the well known state hospital being utilized for consultations	1 (1:42)
Telehealth Liasons- Employed by the not-for-profit organization responsible for supplying the telehealth units and training the involved parties	2 (2:38)
Telehealth Organization Administrator – Senior administrator of the not-for-profit organization responsible for supplying the telehealth units and training the involved parties	1 (0:30)

Table 1. Interview Details (multiple participants were involved in some interviews – hours represent each position’s collective involvement)

Nursing Home	Number of Beds	Distance to Nearest E.R.	Telehealth Implementation	Current Status of Project
A	168	0 miles	January 2009	Implemented
B	50	13 miles	January 2009	Implemented
C	81	2 miles	January 2009	Implemented
D	104	0 miles	January 2009	Implemented
E	104	16 miles	January 2009	Discontinued (Oct 09)
F	59	17 miles	November 2009	In Process of Being Implemented

Table 2. Details of the Studied Nursing Homes

PRELIMINARY FINDINGS

While the term appraisal may conjure up the image of a conscious process, it is often that the individual may be unaware of any or all of the components of their appraisal (Lazarus & Folkman 1984). This was my impression of many of the people interviewed. Nevertheless, many insightful things were said that lend credibility to the proposed antecedents of primary appraisal.

Self-efficacy was a common theme when discussing concerns about the telehealth project. Two distinct types of self-efficacy surfaced: technology and process. Many people spoke about the technology skills needed, as seen in these responses:

Nurse B: *The biggest drawback to me was using the computer. I’m not a computer person, so getting all that...I still don’t have all that down. I don’t think I could do it by myself if I had to.*

Nursing Home Director E: *That’s a complicated system when you get back there to fool with that. You’ve got to have some computer skills. Well, a lot of these nurses don’t have computer skills...[they were] scared to death.*

However, concern with the other medical skills needed by the people using these telehealth units also emerged. An otoscope is a common medical instrument used to examine the ear, and although it is used in a telehealth consultation, the skills involved in using it go beyond simple use of the computer aspects of the telehealth technology.

Physician B: *...showing somebody how to hold the otoscope ...they've never looked in an ear before and now they're asked...to put the otoscope in the ear. First you've got to tell them what an otoscope is, you know, and you've got to have somebody that shows you how to do it so that they don't hurt the patient. It's new skills for them. It's more than just the computer, too, you know, it's just new.*

One physician, who was choosing not to participate in at least one component of the project, repeatedly cited his concern with the process because it involved a different physician giving a second opinion. In this instance, Physician A, viewed the use of telehealth as *shifting the power* to diagnose away from the attending physician.

Physician A: *What the nursing home people presented to us...is...to do that before we send anybody to the emergency room. So instead of me making the decision, they wanted to get a second opinion from an ER physician who's never seen the patient and see what he has to say before we send him. And if they say, "Yeah, send him," then I guess we send him. If they say, "No, don't send him," when I suspect we [should send him], we kind of butt heads there. But that's one of the big things that they wanted the attendings in the nursing homes to do, and I don't do it that way.*

One nursing home returned their telehealth unit after a prolonged period of disuse. Although their initial reactions were reported as positive, we were told that their opinion changed with the constant exposure to a doctor who was very negative about the project. We believe this is preliminary support for the construct of *subjective norm* affecting primary appraisal through a re-appraisal process (in this situation, the nurses went through iterations of reappraisals when exposed to the doctor.)

Nursing Home Director E: *Well, I mean, [the nurses] had positive thinkings but they couldn't...I mean, [the doctor] just didn't want to hear anything about it. He didn't want you to mention it to him.*

Many conversations involved the perceived effectiveness of the telehealth consultations. While some opinions were positive and some were negative, the details were easy to classify as concerning the *effectiveness of the technology* to complete the task or the *effectiveness of the new process* surrounding the task. First, we see a physician's negative perceptions about the new process of receiving ER diagnostic support while the patient is still in the nursing home, which does not involve the technology in any way.

Physician A: *I think I know my patients more than an ER physician does, so I have not used it for that.*

Physician A: *They don't need to see the patient to decide if they need to see them or not. See what I mean? Guy's got chest pain; he's 33 years old. He supposedly drinks. His daddy died at 35—what do you think? Well, send him on down; we don't need to see him on the telemedicine to do that....*

Similarly, we encountered a nurse who believed very strongly in the effectiveness of the telehealth consultations. This belief centered around the new process of being able to *immediately* present a patient from inside the nursing home (i.e., without transporting) to a physician, and had nothing to do with the technology components of the consultations.

Nurse C: *And also if you've got a patient and they're having behavior problems it's a really big issue. And it can be a scary issue. But with being able to present that patient you know that you can present him right away. That is a big difference, in my opinion....I think telemedicine has given me a comfort level.*

However, perceptions about the effectiveness of the technology, devoid of concerns about the new process, were also presented. While previously expressing concerns about the new process effectiveness, Physician A also discussed benefits that the live video camera technology brought to increase the effectiveness of the consultation.

Physician A: *It might be nice to have a live... "Well, pull it over this way, pull it over that way. Squish on it." And do that kind of stuff, get a little bit better picture of it. And you might have a better quality of the transmission through the picture too. Anything visual is going to be nice. It would be good to have for anything that you have to really see.*

Another physician believes that the technology improves the consultation experience, because of the ability to communicate via recorded video with the physician.

Physician B: *Psychiatry is, if anything...it's better. Because one of the problems you have is behaviors. You're concerned about behaviors. You actually can video the patient and the behaviors you're talking about, and let the psychiatrist watch the behaviors.*

While these are only small snippets of the conversations with the stakeholders in the pilot project, they provide support for a set of preliminary constructs in the proposed primary appraisal model, seen in figure 2. These factors, encompassing both

personal and situational components, represent a preliminary set of antecedents that emerged from the interviews and that are used in the primary appraisal process that users undergo to determine if a new IT artifact is a threat or an opportunity.

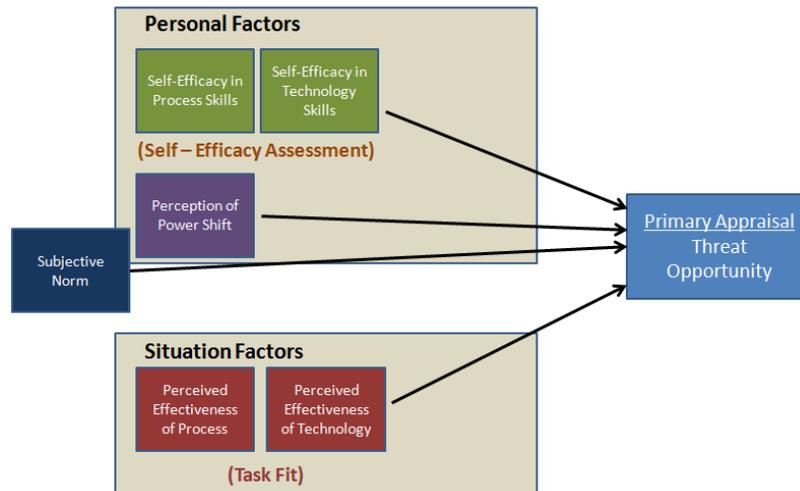


Figure 2. Research Model: Primary Appraisal Model

CONCLUSION

While many technology acceptance theories exist, the coping process perspective offers a new way to understand how users arrive at their adaptation behaviors and can provide a useful framework for integrating adoption and resistance studies. By understanding the process, specifically the primary and secondary appraisals, businesses can more effectively encourage positive appraisals and reduce the occurrences of negative appraisals when introducing a new IT artifact. The current case study is a step towards theorizing a model of primary appraisal as a first step to better understanding the coping-adaptation process. The research model is only a first iteration of our attempt to better understand the primary appraisal process, and the current research is ongoing.

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