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STUDIES IN ADAPTATION TO INFORMATION SYSTEMS: MULTIPLE ROLES AND COPING STRATEGIES

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Introduction

User adaptation to IT has been studied and conceptualized in many ways. Various approaches drawing from both positivist and interpretivist traditions provided insights into how users adapt to IT being implemented and why user adaptation to IT is important. The purpose of my dissertation papers is to offer a better understanding of user adaptation to IT. Doing so, I adopt multiple approaches. The papers of my dissertation will apply both quantitative (Paper 1 and Paper 2) and qualitative methodologies (Paper 3). Offering diverse methodological approaches, I intend providing several views on how the concept of user adaptation to IT can be comprehended.

Overview of the Papers Making up the Dissertation

Information Quantity and IS Success

Information technologies (IT) lead to profound changes in the ways people work. The problem of how users adapt to systems offering increasing amount of information is very specifically salient for managers and more generally salient for those whose tasks are mainly unstructured and subjective, a situation which makes it even more difficult to facilitate daily work tasks via IT (Mintzberg 1972). In particular, information overload can be considered to be an organizational problem (Eppler and Mengis 2004; Schultze and Vandenbosh 1998) in that it can diminish individual performance (Ackoff 1967; Hiltz and Turoff 1985) or affect usage behaviors with respect to the system. Given that studies on information quality naturally focus on quality issues, there is little guidance in this literature on the effects of quantity/volume of information on user behaviors or on how information uncertainty enters into this mix of effects. Significant research questions, therefore, are: (1) What are the effects of information quality on system usage and user satisfaction? (2) Do increasing amounts of system-provided information and information uncertainty have a detrimental effect on information quality? (3) Can the impact of increasing amounts of information be mitigated by filtering mechanisms?

In the first section of the paper, I motivate the need for a deeper grasp of how users adapt (or not) to information load increase. Then, I present the theory base for this research, the DeLone and McLean (2003) updated model of IS success. Moreover, one focus will be on the information quality variable that will be investigated along side information load. Related research includes studies on user responses to information quality.

Next, I develop a model and hypotheses for user responses to increasing amount of information. Depending on user mechanisms of adaptation, information load will have a greater or lesser influence on these relationships. The research model for this study is shown in Figure 1 below:
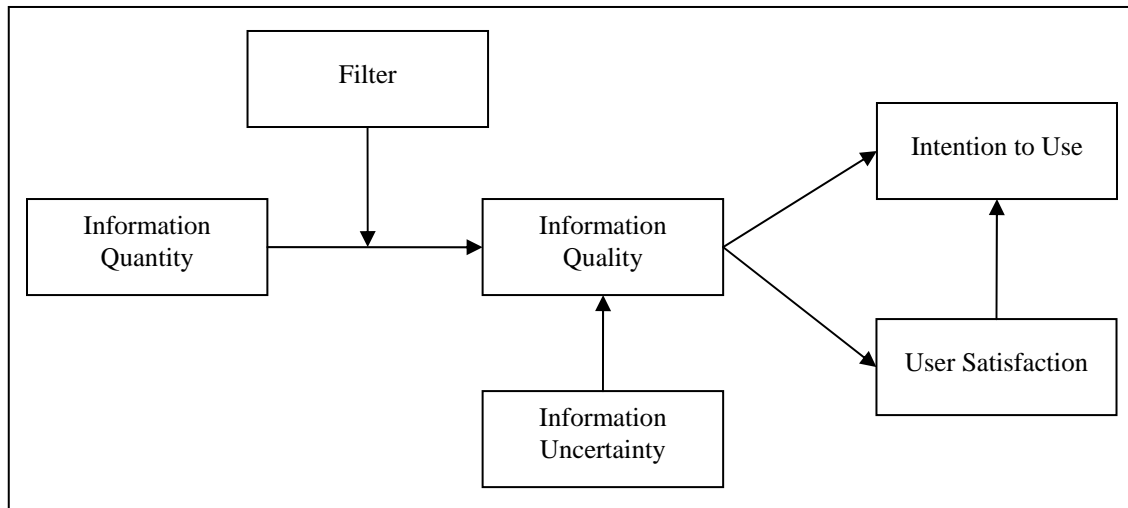
Figure 1. Research Model (Article #1)

Follow the methodology intended for use in the study and the likely contributions to research and practice. In order to address the research questions, I will employ a 3x2x2 experimental design instrumented through a web-based experiment. Since the design will employ random assignment to treatments, it is said to be a true experiment. Subjects will be given an experimental task following a procedure adapted from Lee and Lee (2004) and Evaristo (1993). For the subject tasks, we plan to manipulate three factors: information quantity (3 levels), information uncertainty, and the presence (or not) of a mechanism for filtering information effectively.

This study has three major contributions. First, it develops a model for user adaptation to information overload. Second, it should offer findings on how information overload is perceived by individuals. Third, assuming that many/most of the hypotheses are supported, it will highlight the need for IS managers to specifically take into account the influence of the load of information provided to system users.

Understanding Users' Adaptation Strategies in the Presence of Disruptive Technologies

In my second dissertation paper, I aim to increase our understanding of how users cope with disruptive IT that is in the process of being implemented. Disruptive technologies are those which involve radical and pervasive changes in the organization (Lyytinen and Rose 2003). For that purpose, I rely on the coping model of user adaptation (CMUA) (Beaudry and Pinsonneault 2005), a model that explains user strategies that result from appraisals of IT events. In a first appraisal, the user evaluates the potential impacts of the technology in terms of threats and opportunities embedded in the IT event. In a secondary appraisal, the user evaluates his/her level of control over the situation. Then, that user determines his/her strategies of adaptation.

Whereas Beaudry and Pinsonneault (2005) have developed the extremely interesting CMUA model of user adaptation, they were able to test it only with a small sample of managers. Will these results hold if we examine managers in larger numbers and in different settings? How good is this model? Secondarily, the Beaudry and Pinsonneault (2005) model may be successfully tested in its own right, but will it be prove to be invariant with respect to user cultural values? There is a significant literature that indicates that culture influences system user interactions with respect to IS implementation (Srite and Karahanna 2006; Straub 1994; Straub et al. 1997), but this work does not raise the question of how culture might affect user adaptation strategies. The research questions are, therefore: (1) How do users adapt to disruptive IT? (2) What influence do user cultural values have on their adaptive strategies?

In the first section of this article, I present a model of user strategies of adaptation, admittedly based on CMUA, but which has been augmented by the posited influence of espoused cultural values. My conceptualization of culture is framed as an individual perspective based on values (Srite and Karahanna 2006) and responds to some of the criticisms on previous multicultural studies relying on Hofstede's (1980) conceptualizations (e.g., McCoy et al. 2005). In particular, I will investigate the role of espoused individualism-collectivism and espoused uncertainty avoidance (Srite and Karahanna 2006) on the strategies of adaptation of users. The research model is shown in Figure 2.
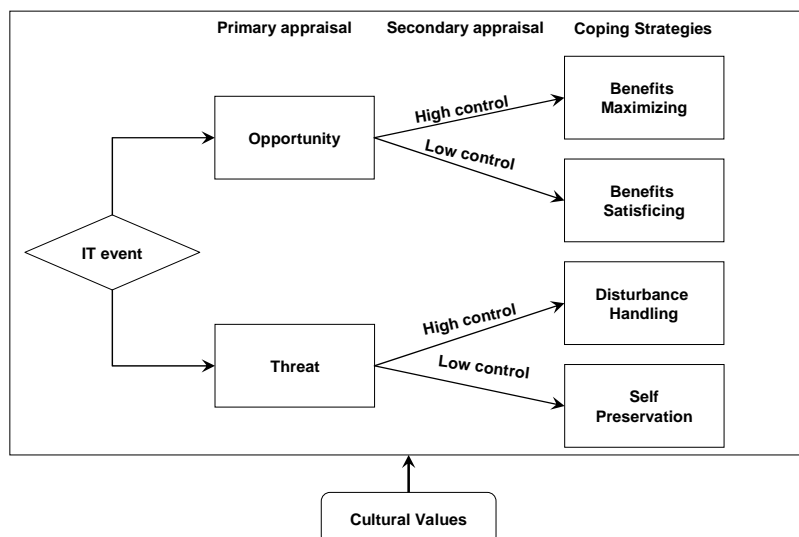
Figure 2. Research Model (Adapted from Beaudry and Pinsonneault (2005)

The study is being carried out in France and the USA in order to exploit the cultural diversity of subjects taking part in the experiment in these two countries. The unit of analysis in this study is the strategy adopted by users and cultural values will be analyzed at an individual level (Dorfman and Howell 1988; McCoy et al. 2005; Srite and Karahanna, 2006).

In the section following are the methods employed and the discussion of the empirical investigation. A 2x2 laboratory experiment with repeated treatment design based on a scenario approach is used for testing the conceptual model. An experimental scenario presents the implementation of an Enterprise Resource Planning (ERP) system. Since ERPs involve radical and pervasive change in an organization (Davenport et al. 1989; Hammer 1990), they qualify for being defined as disruptive (Lyytinen and Rose 2003). Several authors have shown that individuals can resist or be willing to use such systems depending on what they perceive it conveys in terms of threats and opportunities (Boudreau and Robey 2005; Vaast and Walsham 2005).

The final section discusses the likely contributions and limitations of the work, concluding with a future research agenda. This article: (1) aims to develop and validate an instrument for empirically measuring and validating user strategies of adaptation to IT, (2) shows how user strategies of adaptation to IT can inform user interactions with our enhanced model of the CMUA (Beaudry and Pinsonneault 2005), and, finally, (3) demonstrates the need to take user strategies of adaptation into consideration in future research related to IT adoption and use.

Managerial Adaptation Strategies to IT Change

Numerous evidences of the opportunities afforded by information technologies (IT) with respect to the work of middle managers have been expressed in the IS literature (Millman and Hartwick 1987; Pinsonneault and Kraemer 1993). However, little is known on how they specifically adapt to IT and IT change. The practical objective of this paper is to understand managerial adaptation to IT.

There is widespread agreement among researchers that the capabilities provided by IT enable increased decision making performance, and more accuracy in work activities. Many studies in the IS literature relate to individual adaptation to IT change and provide a good understanding of the complexity of the various processes during and after the implementation of an IT. However, while managers appear alternatively as a key agent in the promotion and the success of such a change (Leonard-Barton and Deschamps 1988), as people who benefit most from these advances in terms of increased decision-making performance (Leidner and Elam 1995) or as people potentially threatened by these changes (Grey 1999; Millman and Hartwick 1987; Pinsonneault and Kraemer 1993), little is known about how they carry IT change, and how they personally adapt to it.

Following the Strategic Actor Theory (Crozier and Friedberg 1977) my aim in this paper is to gain knowledge into how middle-managers adapt to IT change. The central issue in this study is especially important given that middle managers can be considered to be on the front line with regard to changes wrought by IT (Millman and Hartwick 1987; Pinsonneault and Kraemer 1993). In addition, they are also presented as those in best position to contribute to the best implementation of those technologies (Currie and Procter 2002; Jackson and Humble 1994; Larsen 1993; Larsen and Wetherbe 1999; Pinsonneault and Kraemer 1993).

Public organizations face important challenges and are ready sources of projects where IT is being introduced. While public organizations are often presented as being late in developing IT (Thong et al. 2000), numerous find in IT an opportunity to improve internal as well as external organizational processes. In spite of this, the IS literature paid relatively little attention to individual adaptation to IT change in public organizations, which have unique characteristics that worth being taken into account (Bozeman and Bretschneider 1986; Grönlund and Horan 2004). Thus, the research questions I expect to address in this paper are the following:

> *RQ1*: What is the role of public middle-managers in the promotion of IT?

> RQ2: How do they behave during the implementation of IT?

> *RQ3*: How are conflicting interests and concerns from multiple actors integrated through the IT change approaches utilized by public administrations?

To answer the research questions, I am using a case study methodology. The case study site involves the implementation of an IT project in a public organization. I will analyze the case studies to the light the conceptual lens of the strategic actor theory (Crozier and Friedberg 1977). Data collection includes several methods, like semi-structured interviews, documentation analysis, and systematic observation.

Conclusion

I set forth three approaches for studying user adaptation to IT. There are, in addition, three theoretical lenses: (1) the IS success model (DeLone and McLean 2003), (2) the Coping Model of User Adaptation (Beaudry and Pinsonneault 2005), and (3) Strategic Actor Theory (Crozier and Friedberg 1977).

In the first approach, I consider user adaptation as a mechanism users enact in order to adapt to a specific phenomenon which is information overload. This research is needed because we need further insights on the issue of information overload which has been under-investigated in MIS (Eppler and Mengis 2004).

In the second approach, I suggest the development of measures for testing the Coping Model of User Adaptation suggested by Beaudry and Pinsonneault (2005). Then I propose to gather data and test the model quantitatively. The basis of this model is the theory of coping (Lazarus and Folkman 1984) from psychology. In addition, in this work, I will analyze the influence of cultural values (Srite and Karahanna 2006) on users coping strategies.

Last, I use a sociological approach to investigate managerial adaptation to IT. In particular, I suggest a case study in order to analyze how middle managers in public administrations adapt to IT change and influence their co-workers in the process of adaptation to IT. For that purpose, I use the Strategic Actor Theory (Crozier and Friedberg 1977). In particular, Strategic Actor theory is new to the IS field and have therefore promises to be of important contribution for the field.

My proposal dissertation three different but complementary views of how individuals adapt to IT. The originality of this work also lies in the variety of methodologies employed with both quantitative experiments and a qualitative study.

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