

The impact of information technology threat avoidance factors on avoidance behavior of user

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This paper examines coping theory, approach-avoidance motivation, cybernetic theory and risk analysis as well as Technology Threat Avoidance Theory to explain IT threat-avoidance behavior. Then we suggest conceptual model to show IT avoidance of users. It includes perceived threat, perceived avoidance, perceived severity, problem-focused coping, emotion-focused coping, IT appropriation. This study will not only improve the understanding about the IT threat-avoidance behavior but also give a new perspective of IT study that has been inclined to the existing technology acceptance theory. Hence in order for users to use IT successfully and effectively, the acceptance perspective of IT as well as the avoidance perspective shall be considered at the same time.

1. Introduction

The information society in the 21st century is rapidly changing the overall paradigm of business and society as well as the environment of individuals from the development of internet and information & telecommunications technology. Presently, these are creating an enormous value in the national economy and industries as they are rapidly diffused throughout the industries such as distribution, finance, stock trade, auction, entertainment, and delivery service. Especially for businesses, the information technology (IT) is not an issue of selection but the general trend that can not go against for the sake of survival. In other words, this seems to tell that it can be a fatal threat to the business unable to use IT and can be a great opportunity to the business of using IT appropriately. Likewise, internet and IT have brought about a large change as to be regarded as an innovation in the entire society and individuals and businesses have tried hard to adopt and use IT so as to adapt to this change.

For the successful introduction and use of IT, a large number of studies in relation to the information system (IS) have been focused on the information technology acceptance (TAM). However as IT provides the rich contents and convenient user

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interfaces, the importance of usefulness and easiness that are the key elements of IT is gradually weakened. Rather if we consider the adverse effect of information promotion, it may be more meaningful to look into the factors of information technology threat avoidance. For example, it is to suggest the avoidance motives of individual information technology due to the adverse functions of information promotion such as danger of cyber terrorism, virus damage, hacking, exposure of personal information, information gap, and other cyber crimes. Of course as for the method of reducing these malicious IT threats, the existing IT acceptance theory can be applied in the perspective of accepting the IT security measures (safeguarding IT) such as anti-virus and anti-spyware software. Actually, a number of IS researchers have conducted this kind of studies and many people seem to view the acceptance of security IT as the avoidance of malicious IT. However, the powerful theoretical and practical proofs show that there is a fundamental difference between the behaviors of acceptance and avoidance (Carver and White 1994; Elliot 2006; Elliot and Covington 2001).

Looking at the approach-avoidance motivation in the psychological perspective in order to explain the IT threat-avoidance behavior of users, human beings show two extreme aspects of behavior such as approach and avoidance (Mehrabian and Russell 1974). The approach behavior is the behavior caused and controlled by a positive/desirable action or possibility (Elliot, 1999); on the other hand, the avoidance behavior is the behavior caused and controlled by a negative/undesirable action or possibility (Elliot, 1999). When a new IT system is introduced to an organization, the members of the organization may hold the approach-avoidance motivation about that. In other words, the members of the organization may have the approach motivation when a positive result is obtained by using a specific IT system and may hold an avoidance motivation when having a negative result. Then if new IT system is recognized as a threat, users may take an action to cope with that.

Coping can be defined as “the cognitive and behavioral efforts to manage the internal/external requirements evaluated as a thing that claims or exceeds the resource of individual” (Lazarus and Folkman 1984, p. 141). In other words, it is a cognitive process of determining by which method to solve the issue when having an occupational problem or mental problem by using a specific IT solution. Beaudry and Pinsonneault (2001) argue that the implementation of new IT can be regarded as a

confusing thing to the members of organization and therefore, those facing this problem may perform a coping behavior or adaptation behavior. The coping behavior is initiated from the evaluation of a problem and people regard the situation confronted with themselves as threat and loss, or challenge. For the problem recognized as threat and loss, people tend to perceive it as a thing that can not be solved by themselves and hence, take an emotional coping behavior. They cope with the situation in a way that reduce the desirable level, cut down the self-involvement, or find an alternative measure of satisfaction. Next when people recognize the problem as a challenge, they seem to take a problem-oriented coping behavior and they treat this problem as a thing that can be controlled. Accordingly, they cope with the problem in a way that changes the environmental pressure, obstacle or resource. However since there are not many references that could explain the threat-avoidance behavior of IT users, this study has tried to support this research by synthesizing the materials in the fields of psychology, health care, risk analysis and information system. Accordingly, this study intends not only to establish the definition of the IT threat-avoidance factors that no many studies have been conducted yet around the technology threat avoidance theory (TTAT), approach-avoidance motivation and coping theory but also to develop the tools that can measure them effectively. Also by comparing the IT acceptance factors and IT threat-avoidance factors that have been conducted so far by many IS researchers, this study intends to draw the scientific and practical implications. Together with these, this study tries to conduct the end-to-end study that looks into the changes in the IT avoidance behavior of IT users from the early introduction of IT up to the maturity time by checking the IT threat-avoidance factors of IT users in the organization that has introduced new IT system rather than general IT users. Additionally, this study tries to investigate the threat-avoidance behavior for the IT innovation tool of individuals. As mentioned previously, IT is used usefully when individual or business creates new value. Despite of that, IT still holds many problems from the adverse function of information promotion and hence, individuals and businesses experience various IT failures. It is estimated that about 70% of the information system implementation has actually failed (Heewoong Kim et al., 2006). While the successful investment on IT can lead to a high productivity improvement, the failed system implementation may raise undesirable results such as financial loss and dissatisfaction between users.

Therefore, it seems necessary to conduct a study why people try to avoid implementing IT. However in relation to the introduction and use of IT, most of studies up to now have been based on the IT acceptance theory. These studies have only focused on the positive perspectives why users accept IT rather than having a focus on the negative perspectives why people try to avoid IT.

Accordingly, this study is intended to perceive the IT threats to individuals as well as to explain about the cognitive process of avoiding IT while basing on the technology threat avoidance theory (TTAT). Also based on the results, this study tries to suggest a measure that either removes or reduces the avoidance behavior of EOKS users to the IT threat.

2. Literature Review

2.1 Technology Threat Avoidance Theory

Up until now, most of IS studies have been conducted around the technology acceptance theory. Of course, it is very important to check the factors determining the acceptance of IT in using the IT. However, the acceptance behavior is not the only thing in using IT. The attitude of trying to avoid IT may be a part of that behavior. Accordingly, it would be quite meaningful to look into the IT threat-avoidance behavior.

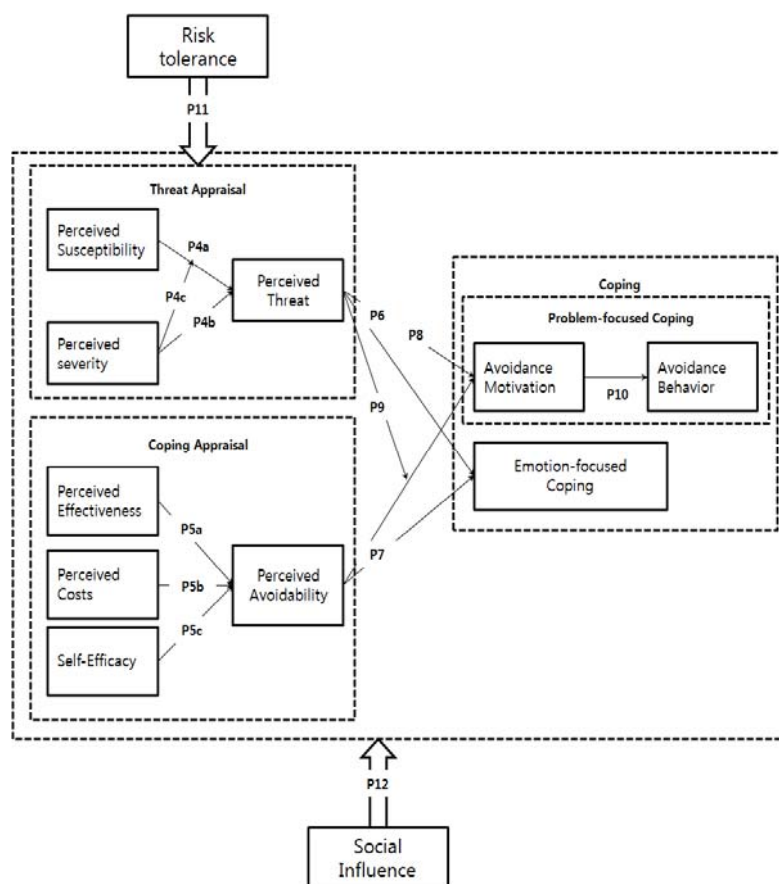
Basically, the avoidance and acceptance behaviors are two different situations and the technology acceptance theory is not complete although it is important to understand the IT threat-avoidance behavior of users. Since there are not many studies related to the IT threat, TTAT has expanded the theory by synthesizing various references in the fields of psychology, health care, risk analysis and information system.

In order to explain the behavior of IT users that tries to avoid the threat of malicious information technologies, Liang and Xue (2009) have proposed the technology threat avoidance theory (TTAT). He mentioned that TTAT as a dynamic and positive feedback loop could explain about the avoidance behavior through the cybernetic theory and coping theory. Here, users go through two cognitive processes and this is the coping appraisal that determines how to cope with the IT threat appraisal and IT

threat. If users are aware of a malicious IT and consider it seriously as a negative result, they will perceive the IT threat. The threat awareness may draw a coping judgment and users may appraise the level that the IT threat can be avoided through the safeguarding measures such as perceived cost and self efficacy. When users judge that the IT threat can be avoided by the safeguarding measures, they may take a problem-focused coping measure; and when the IT threat could not be avoided completely, they may take an emotion-focused coping measure.

The validity of TTAT starts with the assumption that the avoidance and acceptance behaviors of people are different in the qualitative perspective. This difference suggests the need of TTAT development. Humans inherently try to avoid a negative stimulus and tend to get closer to a positive stimulus (James 1890; Pavlov 1927; Skinner 1953). The stimulus in the IT environment refers to various information technologies.

The <Figure 1> shows the proposed model of TTAT that is suggested by Liang and Xue (2009).

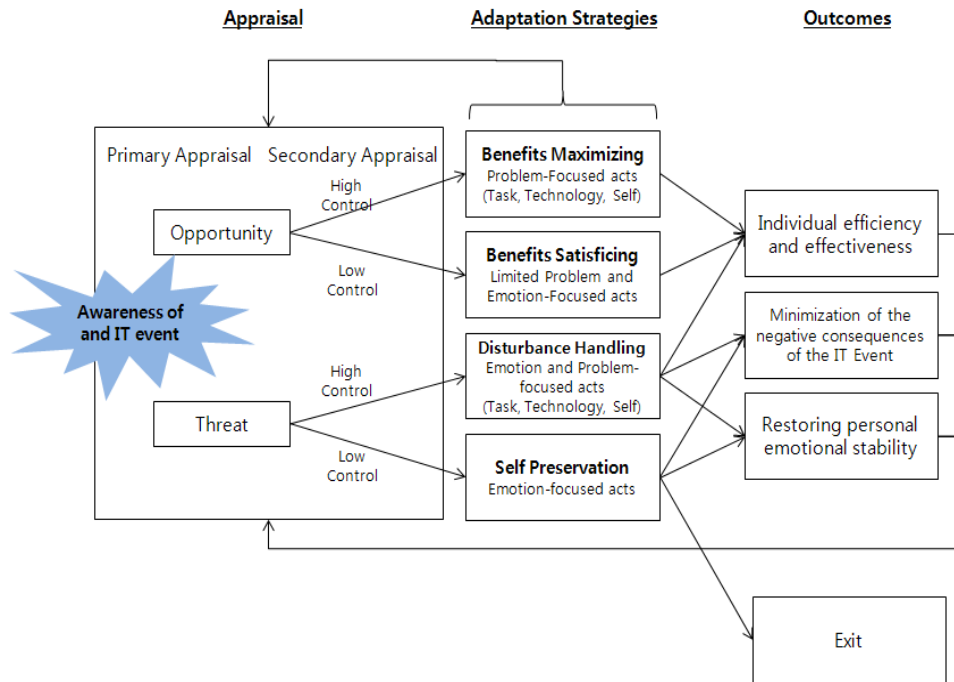


<Figure 1> Technology Threats Avoidance Theory

2.2 Approach-Avoidance Motivation

The coping theory is widely used in the human psychology in order to explain and predict the behavior of people faced with a confusing problem. New IT implementation of an organization may be regarded as a confusing thing and the behavior of the users faced with such problem may be analyzed by the coping theory. Beaudry and Pinsonneault (2005) have defined the cognitive and behavioral efforts performed when users cope with an important IT event occurred in the work environment and have argued that they might select the adaptation strategy through the primary appraisal and secondary appraisal. In the primary appraisal, users perceive new information system as a threat or opportunity. While some users may try to learn new technology so as to apply new system to their job process by considering it as necessary to their job, others may worry about losing their job by thinking that they do not have the technology to implement new IT. Next in the secondary appraisal, users evaluate how much control they have on the IT work. The control over the self is mentioned as much to feel that to what degree they could adapt themselves to new environment and the control over technology is mentioned how much they could control the features and functions of IT while developing and using IT. When people evaluate the IT work as an opportunity and feel that they could control the situation, users may use the maximization strategy of gain. And when they consider the IT work as an opportunity but feel that they have a limited control over the situation, users may use the satisfaction strategy of gain. Also when people evaluate the IT work as a threat but feel that they could control the situation, users may use the adjustment strategy of hindrance factors; when they consider the IT work as a threat but feel that users have a limited control over the situation, they may take the self-defensive strategy.

The <Figure 2> shows the user adaptation and coping model of Beaudry and Pinsonneault (2005).



<Figure 2> Coping Theory

Since the implementation of new IT can work as an impeding factor to users, Beaudry and Pinsonneault (2001) have tried to explain about the process that users adapt to new IT. Especially by seeing the adaptation process as the event occurring between IT and user, IT and work system, IT and IT, and user and work system, they have considered that a high level of adaptation requires a high degree of integration between IT, user and work system.

3. Research Model

When users notice malicious IT threat and regard the negative result of it serious, they perceive the degree of avoidance to cope with it(Liang & Xue, 2009). Beaudry and Pinsonneault(2001) refer that the implementation of a new IT can be seen as a disruptive event (positive or negative) in the habits and work system of users and that the behaviors of users facing such events can be analyzed using the coping theory. Therefore the threat for new IT that users perceive leads perceived avoidance.

H1: Perceived Threat for new IT is positively associated with Perceived Avoidance.

Users evaluate the degree to avoid IT threat through a safeguarding measure such as perceived effectiveness, perceived costs, self-efficacy when they appraise how to cope with IT threat(Liang & Xue(2009)). Beaudry and Pinsonneaut(2001) assert that If users perceive the threat, they take problem-focused coping, or If they believe that the threat is not avoidable, they will passively avoid the threat by performing emotion-focused coping.

H2: Perceived Avoidance for new IT is positively associated with Problem-focused coping.

H3: Perceived Avoidance for new IT is positively associated with Emotion-focused coping.

For the problem recognized as threat and loss, people tend to perceive it as a thing that can not be solved by themselves and hence, take an emotional coping behavior. Next when people recognize the problem as a challenge, they seem to take a problem-oriented coping behavior and they treat this problem as a thing that can be controlled. This shows that users act according to the degree of perceived severity. Thus perceived severity will moderate the relation between avoidance behavior and coping behavior.

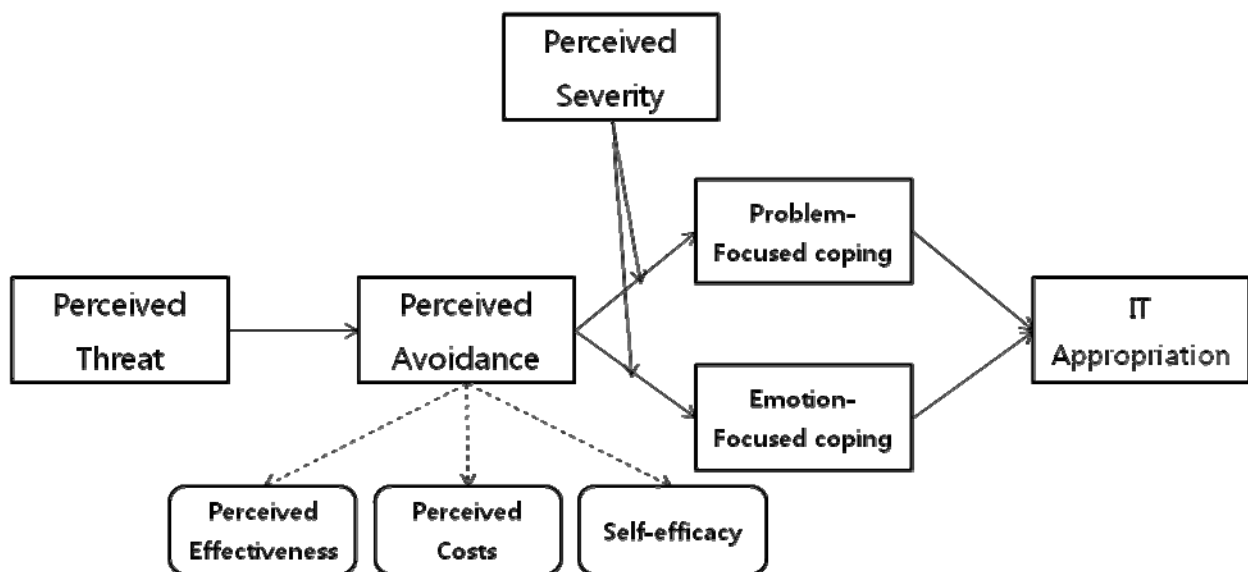
H4: The relationship between Perceived Avoidance and Problem-focused coping is moderated by Perceived severity.

H5: The relationship between Perceived Avoidance and Emotion-focused coping is moderated by Perceived severity.

Many researchers have presented user adaptation such as reinvention, Adaption, appropriation. Poole and DeSanctis(1990) defined appropriation as the way a group uses, adapts, and reproduces the structures of a technology. Namely, while users employ information technology, coping behavior of users occurs and repeats. Through the process, users are appropriated for the information technology.

H6: Problem-focused coping is positively associated with IT appropriation.

H6: Emotion-focused coping is positively associated with IT appropriation.



<Figure 3> Research Model

4. Expected Conclusion and Application

This study will not only improve the understanding about the IT threat-avoidance behavior but also give a new perspective of IT study that has been inclined to the existing technology acceptance theory. Hence in order for users to use IT successfully and effectively, the acceptance perspective of IT as well as the avoidance perspective shall be considered at the same time. Also through these, it is expected that the IT threat and avoidance could be perceived and new coping method could be searched. Through the result of this study, we expect that this study could provide an important guide in designing the strategy and policy of successful IT use by checking the negative awareness perspective of IT that has not been explained in the past by the technology acceptance model.

As for the scientific use of this study, this study provides a framework in explaining the cognitive process that people try to avoid the IT threat ultimately by judging the threat and seeking a coping measure. We expect that this framework could play the role of supplementing the scientific role of TAM that has been the existing classical field of IS study.

Next as for the practical use of this study, the IT managers may be able to present more effective organization mechanism in providing the IT threat-avoidance training to workers while basing on the result of this study. Together with these, it may be

possible to propose a coping measure for the IT threat-avoidance felt by workers according to the time of growth and maturity upon introducing new IT to an organization. Also, the result of this study may provide normative guidelines to the practical use of IT. In other words, the communication and training program may be designed while basing on the framework provided by the result of this study.

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