IS Acceptance in the Perspective of the Extended TTF Theory: An Exploratory Study on Employment Insurance Systems in Korea

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Abstract

While information technology has been advanced impressively, the issue of system underutilization has continued. Although TAM provides a theoretical and empirical model for explaining information technology acceptance, there exist some issues: lack of focusing task and organization. The present study examines the motivational factors influencing the beliefs about the system, in terms of the extended TTF (task-technology fit) model, to address the issues. For this purpose, an exploratory case study was conducted based on the data gathered from a Web-based survey. The present research proposes five propositions, based on the results of the case study and prior study findings, which can be used as a starting point for future research.

1. Introduction

In today's dynamically changing business environment, information systems (IS) have been considered to have the potential to improve organizational performance. Although information technology has been advanced impressively, the issue of system underutilization has continued [7]. Therefore, understanding and identifying the conditions or factors under which IS will be accepted and used in an organization remains a central concern of information systems research and practice.

In the past decades, significant progress has been made in explaining and predicting user acceptance of information technology in a workplace. Among them, technology acceptance model (TAM) proposed by Davis [5] predicts and explains user acceptance mechanism for specific information technology based on the causal linkage "belief-attitude-intention-behavior". TAM posits that two particular beliefs, perceived usefulness and perceived ease of use, are the primary determinants of information technology usage. Although TAM provides a theoretical and empirical model for explaining information technology acceptance, there exist some challenges as follows. First, Davis [5] argued that future technology acceptance research need to address how other variables affect usefulness, ease of use, and user acceptance. However, whereas prior research has focused considerable attention on beliefs directly affecting attitudes and intentions, less emphasis has been placed on how such beliefs are formed [1]. Second, it is argued that a weakness of TAM for understanding information technology utilization is its lack of task and organization focus [3,8]. This is because TAM's fundamental constructs do not fully reflect the variety of user task environment. IS that can properly support tasks and can be well managed by an organization are likely to be accepted and used by users.

The present study explores IS acceptance behavior in the perspective of the extended task-technology fit theory to address the above issues.

2. Theoretical Background

TAM has gained popularity in recent years as a tool for assessing and predicting the usage of information technology [6,7]. Based on the theory of reasoned action (TRA) [4], TAM was designed to understand the causal chain linking beliefs to attitudes, intentions, and behaviors in a workplace. TAM posits that actual system usage is influenced by behavioral intention to use the system, which is in turn affected by attitude toward using the system. Finally, attitude is directly determined by belief about the system.

Although many studies have modified and extended the original TAM to identify various additional factors to improve its predictive and explanatory power, there still remain some issues. First, most studies involved students and examined the introduction of single-function technology such as word processor, spread sheet, e-mail, Web surfing using Internet, etc. [7,8]. However, it would be more beneficial to assess information technology acceptance behavior with business process applications in a workplace if we are more interested in applying the model to a business environment. Second, TAM has focused more attention

on the technological aspects as external variables rather than organizational aspects. So, it is argued that IS in TAM are considered to be an independent issue in organizational dynamics [7]. Therefore, it is suggested that TAM should be integrated into a broader model including organizational factors interacting with technology ones such as task fit and organization support if it is to increase the predictive capacity.

Information technology is a tool by which organizational members use to accomplish organizational tasks. The capability of information technology to support a task is represented by a theory known as task-technology fit (TTF) model, which implies matching of the abilities of the technology to the demands of the task [3,5]. TTF posits that information technology will be used if and only if its functions available to the user support (fit) the task requirements of the user.

Although the concept of the fit between task and technology in TTF model provides an opportunity of addressing a lack of task focus of TAM, TTF tends to less emphasize organizational supports for IS service provision, which make the technology available to the users in a way to meet the task requirements. Organizational supports are more effective and important particularly when the information technology is the business process applications tightly related to the activities of the users because these applications should be continuously maintained and managed by the organization in terms of business process change and technical support.

3. Research Model

The present study integrates TAM with extended TTF model to identify and examine motivational factors affecting beliefs about the system, as illustrated in Figure 1. The proposed research framework included organization-technology fit construct as a new factor, which extended the TTF model. Organization-technology fit focuses on the degree to which organizational support characteristics match technology functionality requirements. This variable is expected to improve explanatory capacity by explicitly considering organizational support aspects, which is ignored in both TTF and TAM. The basic assumption is that task-technology fit and organization-technology fit will have positive effects on the beliefs about the systems consisting of perceived usefulness and perceived ease of use. In addition to that, we also posit that task-technology fit will be influenced by organization-technology fit.

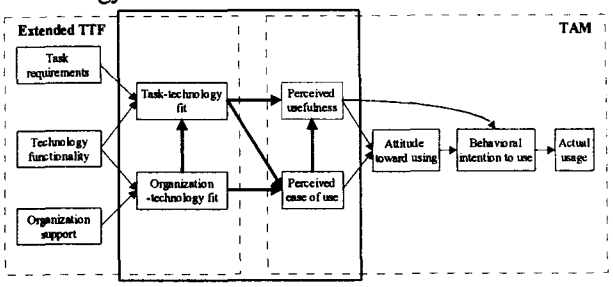

Figure 3. Research framework

The present research conducted an exploratory case study to identify the antecedent factors influencing perceived usefulness and ease of use, which lead to behavioral intention to use and actual usage of IS. In this research, the subjects were employees working for Ministry of Labor in Republic of Korea. They were using various applications (that is, subsystems) of the employment insurance information system to conduct their tasks for primarily supporting the unemployed people such as unemployment benefits, employment security project, vocational ability development project, and so on. The data were gathered using questionnaires administered to the user of the employment insurance system through a Web-based survey. The questionnaires were distributed to employees (4,547 users) of 6 divisions who were using the systems after the survey schedule had been notified in the internal bulletin board system a week ago. The individuals were asked to indicate their agreement or disagreement with the survey instruments using a five-point Lkert-type scale. The returned questionnaires were initially screened for usability and reliability. 1,348 responses were found to be complete and usable, rendering a response rate of 29.6%.

4. Case Study: Employment Insurance System

The employment insurance system was launched on 1 July 1995 to support the employment insurance administration of Ministry of Labor in Republic of Korea, which aims to secure a systematic device for dealing with imbalances between the supply and demand of workforce. The employment insurance system was based on UNISYS mainframes (IX5802-4 and M2200-503) running 9 subsystems, which support various tasks of 6 divisions including application·collection·payment for unemployment benefits, workplace administration, subsidy control, fund management, etc.

The TTF perspective views technology as a means by which a goal-directed individual performs tasks [5].

Task-technology fit means the matching between technology functionality and task requirements by the definition [3,5]. According to TTF theory, higher task-technology fit leads to positive user evaluations for the technology and results in better performance. That is, if the technology provides a good fit with the task, users should perceive that the technology is useful in performing their task. To examine this relationship through the case, we plotted points representing mean values of two constructs of interest – task-technology fit and perceived usefulness – on a graph based on the collected data, as shown in Figure 2.

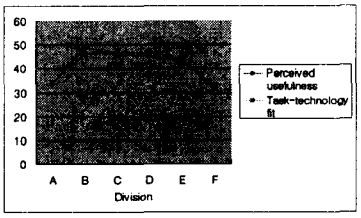

Figure 2. TTF and PU

From the graph, we could find a similar pattern of movements in values of task-technology fit and perceived usefulness for each division even though it showed somewhat inconsistent association between them. Based on the above discussions, the following proposition was suggested.

- **Proposition 1.** *Task-technology fit will have a correlation with perceived usefulness.*

In addition to that, increased task-technology fit may also lead to higher perceived ease of use. As the users develop an understanding of how the technology supports their tasks through increased task-technology fit, they accumulate more experience and knowledge with the technology, leading to increased perceived ease of use. If we recall that TAM suggests a relationship between perceived usefulness and perceived ease of use, we can assume that task-technology fit may also determine, in part, perceived ease of use because task-technology fit is associated with perceived usefulness. This relationship was examined by plotting points, as shown in Figure 3.

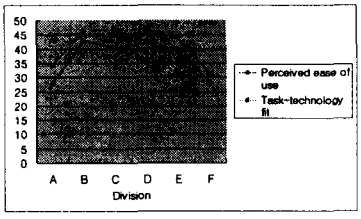

Figure 3. TTF and PEU

The graph showed a similar pattern in movement of values of task-technology fit and perceived ease of use for each division. Therefore, the following proposition was generated based on the above discussions.

- **Proposition 2.** *Task-technology fit will have a correlation with perceived ease of use.*

Organization-technology fit is defined as the correspondence between technology functionality requirements and organizational support characteristics for IS service provision. IS supporting businesses processes should be continuously maintained by IS service professionals. Good organizational supports make IS available to the users all the time and facilitate translation of newly defined task requirements to IS functionality. Therefore, we can expect that higher organization-technology fit lead to increased task-technology fit. The relationship between organization-technology fit and task-technology fit was inspected through the case, as illustrated in Figure 4.

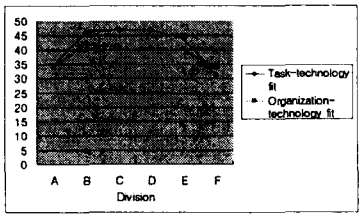

Figure 4. OTF and TTF

As seen in the graph, organization-technology fit and task-technology fit showed a similar pattern except for a division, F-division. We guess that this is because F-division is an outsourced corporation, which are primarily responsible for welfare programs for workers including industrial accident compensation insurance. Considering that situation, organization-technology fit is expected to have an influence on task-technology fit. This led to the following proposition.

- **Proposition 3.** *Organization-technology fit will have a correlation with task-technology fit.*

Perceived ease of use of technology should be partly influenced by organizational supports for IS service provision. Organization-technology fit represents how well organizational support characteristics meet technology functionality requirements. Therefore, as users accumulate more knowledge about IS through IS support services provided, the system becomes easier for them to use. This relationship was examined through the case, as illustrated in Figure 5.

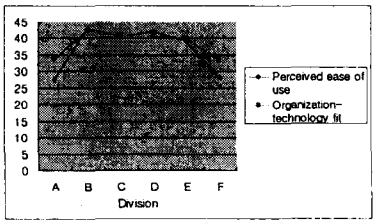

Figure 5. OTF and PEU

From the graph, we could identify a similar pattern of

movements between organization-technology fit and perceived ease of use even though it did not show a consistent correlation between them. Therefore, we can expect that individuals who use the systems with highly support of IS service will have positive perception on ease of use of the system.

- **Proposition 4.** *Organization-technology fit will have a correlation with perceived ease of use.*

The present study re-examines the relationship between perceived usefulness and perceived ease of use in the context of using the business process applications. According to TAM, perceived usefulness is influenced by perceived ease of use because the easier system is to use the more useful it can be. This relationship was examined through a graph plotting mean values of two belief constructs, as illustrated in Figure 6.

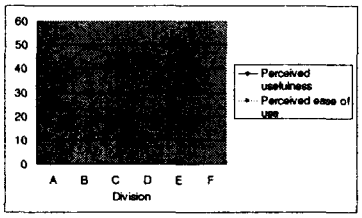

Figure 6. PEU and PU

As expected, the graph showed a similar pattern in movement of values of perceived ease of use and perceived usefulness for each division. Therefore, the following proposition was generated based on the above discussions.

- **Proposition 5.** *Perceived ease of use will have a correlation with perceived usefulness.*

5. Implications and Conclusion

The present study examined the motivational factors influencing perceived usefulness and perceived ease of use that represent the beliefs about the system, in terms of the extended TTF model, in the context of using business process applications. For this purpose, an exploratory case study was conducted based on the data gathered from a Web-based survey. The present research proposed five propositions, based on the results of the case study and prior study findings, which can be used as a starting point for future research.

This study has some implications for researchers and practitioners who are interested in information systems acceptance behavior of users. First, the motivational factors of the beliefs were proposed in the perspective of the extended TTF model. An understanding of what causes users to hold certain beliefs about the target information systems would be of value not only to practitioners responsible for the implementation and deployment of information systems, but also to researchers interested in explaining the paths through which systems usage behavior is manifested [1]. Second, TAM's weakness of information systems usage may be mainly attributable to its lack of how well the information systems meet the task requirements and how well they are supported by the organization [3,8]. In particular, this weakness may be more amplified in the context of using business process applications rather than single-function technology such as a word processor because the former require more organizational dynamics than the latter. The proposed model addresses this weakness to improve the understanding for the information technology utilization behavior by using the fit concept including task-technology fit and organization-technology fit. Such understanding is especially important to decision-makers who are responsible for investing in information systems for organizational members.

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