The Differences of Influencing Factors on IOS Usage Intention between Adopters and Non-Adopters in Small- and Medium-Sized Firms

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Abstract – While the goal of new IT adoption in small and medium sized firms is to choose an optimal system to fit with their own environments and conditions, that of IT post-adoption usage is to fully implement new IT and maximize their benefits from it. Therefore, the decision-making environments of new IT adoption is definitely different from those of post-adoption. Also, The direct experience of IT usage can provide some learning effect and the change of users' beliefs on new IT. From this point of view, this study attempts to figure out the differences of influencing factors on IOS usage intention between adopters and non-adopters. The results show that there are clear differences of influencing factors between two groups. Non-adopter group shows that perceived financial cost and ability of use have significant influences on IOS usage intention, while relative advantage and perceived risk in adopter group have statistically significant influences on post-adoption usage of IOS.

Keywords: adoption, post-adoption, IOS, small- and medium-sized firms, diffusion, innovation.

1 Introduction

According to social cognitive theory (Bandura, 1977, 1982, 1986), it is said that personal behavior can be determined through the reciprocal relationship with his/her own environment and personal characteristics. Thus, behavior and intention to use a new information technology(IT) may be affected by environmental and personal factors. In addition, innovative characteristics of a new IT can have an effect on personal behaviors. Therefore, environmental factors, personal characteristics, and innovative technology can play an important role in determining personal behaviors in the field of IT usage.

Organizational adoption and usage of an innovative IT can be different from personal IT usage in that each organization has its own specific environment and goals of task and management. Cooper and Zmud (1990) in their review of innovation adoption literature identified five major categories of factors influencing adoption: innovation, organizational, environmental, task, and individual characteristics. These five categories of influencing factors have provided a rich ground for IS adoption research of organizations.

In the view of diffusion of innovation(DOI), true informization in organizations must include not only choosing a proper innovative technology but also optimally using it for full implementation. However, SMFs(small and medium sized firms) have been faced with many problems such as the lack of resources and strategic planning for informization. For this reason, even though they may adopt a new IT like inter-organizational system(IOS), it is often not linked to full implementation or direct improvement of performance. This fact shows that the environment of IT adoption is different from those of post-adoption for full implementation. While potential adopters make a decision of IT investment based on the information or indirect experience of new IT through his/her own social system, adopters may decide post-adoption usage with direct experience of using IT. IT experience can provide adopters with the learning effects and make their beliefs for IT usage changed. Also, the change of decision-making environments can bring different effects of influencing factors on IT usage. From this point of view, this study attempts to figure out the differences of influencing factors of IOS usage between adopters and non-adopters.

By reviewing the literature, we address a research model with three categories: innovation, organizational, and external environment characteristics, which are known to influence the intention on IOS usage. Among these categories, innovational characteristics include four factors such as relative advantage, compatibility, complexity, and perceived risk, and organizational

characteristics consist of three factors such as IT infrastructure, perceived financial cost, and ability to use IOS. Environment characteristic include three factors such as industry pressure, partner influence, environmental uncertainty.

2 Methodology

2.1 Research Questions

As the main purpose of this study is to understand the differences of influencing factors between adopter and non-adopter, the research questions are summarized as follows (see Figure 1);

1. What are influencing factors on IOS usage in both adopter and non-adopter?

2. Are there some differences of influencing effects on IOS usage between adopter and non-adopter?
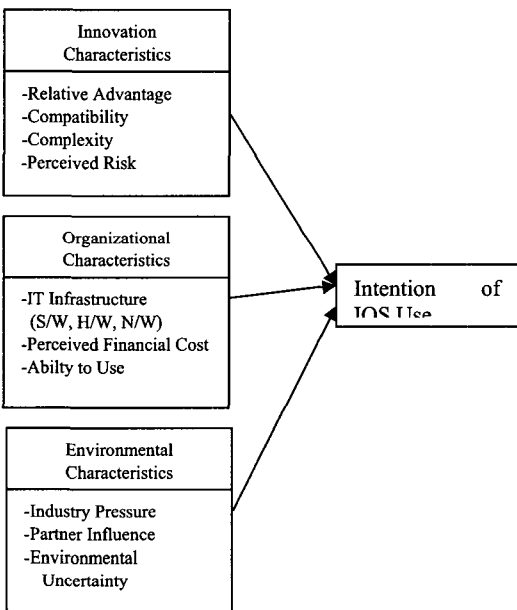

Figure1. Conceptual Research Model

2.2 Data Gathering

A survey was conducted to collect data on CEO and CIO of SMFs. As the strategy and decision making on IT investment depend heavily upon chief management in SMFs, the samples were limited to CEO and CIO. Total 500 questionnaires were distributed and 136 responses were collected. 114 responses were selected for analysis except 22 incomplete responses.

The questionnaire is composed of 40 questions to measure the intention of IOS usage, 10 independent variables of the three categories such as innovation, organizational, environmental characteristics. Our questionnaire was organized based on the previous studies such as Rogers(1983), Grover(1993), Jamieson(1996), Cash et. al.(1992), Compeau and Higgins(1995) and so on. 5 point Likert type scale was used for each question. The collected data were classified into non-adopter group and adopter group.

2.3 Analysis

Prior to answering for research questions, the data were analyzed to determine the reliability and validity for variables. To test the validity, factor analysis was performed by principal component analysis using an orthogonal (Varimax) rotation of the factor structure according to the categories of independent variables such as innovation, organizational, and environmental characteristics. As two items were not shown as a consistent relationship with factors, those items were deleted for final analysis. With the remaining items, reliability test was done by Cronbach's a, and the reliability of all variables shows the high internal consistency (over 0.7).

Multiple regression analysis was used to analyze the data for finding the answers for our research questions, and the total of three times multiple regression analyses were done for finding the influencing factors on IOS usage for all respondents and the differences of influencing factors between adopter and non-adopter.

3 Results

3.1 Influencing Factors on IOS Usage

The result of multiple regression analysis on influencing factors of IOS usage for all respondents shows that five factors such as relative advantage, perceived risk, complexity, perceived financial cost, and ability to use have statistically significant influences on intention of IOS usage (see Table 1).

Table 1. Influencing Factors on IOS Usage

Indep. Variables	Beta	T	Sig
Relative Advantage	.154	1.895	.061
Perceived Risk	.-.229	-2.402	.018
Complexity	.139	1.457	.148
Compatibility	.149	1.851	.067
IT Infrastructure	-.034	.-.384	.702
Perceived Finanical Cost	-.319	-.3.286	.001

Abilty to Use	.247	.2.899	.005			
Industry Pressure	.084	.946	.346			
Partner Influence	.016	.183	.855			
Environemental Uncertainty	-.007	-.085	.933			
R^2 (Adj.R^2)	.495(.445)					
F	9.886					
Sig. F	.000					

As summarizing the result, some of innovation and organizational characteristics play an important role in decision making of IOS usage for all respondents, while all environmental characteristics have no statistical relationship with IOS usage.

3.2 The differences of Influencing Factors between Adopter and Non-Adopter

The results of multiple regression analysis to find the differences between adopter and non-adopter show clear differences between two groups. In non-adopter group, only organizational characteristics such as perceived financial cost and ability to use have statistically significant influences on intention of IOS usage (see Table 2). On the other hand, only innovation characteristics such as relative advantage and perceived risk have statistically significant influence on the intention of IOS usage. By the results of two multiple regression analysis for two groups, it is said that there are clear differences of influencing factors between two groups. It shows that adoption is different from post-adoption usage of IOS. That is, the post-adoption environments of IOS can be changed on the process of implementation, compared with the decision-making environments of adoption.

According to the results, IT readiness such as financial cost and ability to use new innovation technology like IOS has more influence on decision making for potential adopters. As adopter group has experienced IOS adoption and usage, the factors from innovation characteristics, which are brought from the process of implementation, are considered as more important than other factors on IOS continuing usage.

Table 2. The differences of Influencing Factors between Adopter and Non-Adopter

Indep. Variables	Non-Adopter			Adopter		
	Beta	T	Sig.	Beta	T	Sig
Relative Advantage	.071	.638	.526	.346	2.35	.027
Perceived Risk	-.163	-1.16	.249	-.451	-2.65	.014
Complexity	.123	.982	.330	.105	.612	.546
Compatibility	.111	1.04	.302	.140	.899	.377
IT Infrastructure	-.069	-.595	.554	.084	.470	.642
Perceived Finanacial Cost	-.352	-2.89	.005	-.177	1.04	.309
Abilty to Use	.320	2.94	.005	.164	.893	.380
Industry Pressure	.056	.497	.621	.138	.700	.490
Partner Influence	.066	.589	.558	-.107	-.498	.623
Environemental Uncertainty	-.016	-.158	.875	-.046	-.260	.797
R^2 (Adj.R^2)	.489 (.408)			.575 (.412)		
F	6.029			3.522		
Sig. F	.000			.005		

3.3 Additional Analysis

To explain specific characteristics of groups according to adopter and non-adopter, we performed an additional analysis. The additional analysis was done through one-way ANOVA test for the two groups to compare the mean values of the variables. The result shows that the differences of six variables for the two groups are statistically significant (see Table 3).

Table 3. One way ANOVA Test of Variables between Adopter and Non-Adopter group

Indep. Variables	Non-Adopter (n=77)	Adopter (n=37)	Total	Sig.
Relative Advantage	3.7359	3.7658	3.746	.816
Perceived Risk	2.4956	2.2883	2.428	.153
Complexity	2.8506	2.5153	2.741	.060
Compatibility	3.0260	3.3514	3.132	.025
IT Infrastructure	2.9903	3.6554	3.206	.000
Perceived Finanacial Cost	3.1126	2.4865	2.909	.000
Abilty to Use	3.1299	3.2297	3.162	.516
Industry Pressure	2.0614	2.1171	2.08	.720
Partner Influence	2.5844	2.7162	2.627	.568
Environmental Uncertainty	3.3766	3.4595	3.404	.597
Intention of IOS Usage	3.4286	3.7658	3.538	.016

By the result, the adopter group has more intention of IOS usage and higher level of IT readiness while non-adopter group has less intention and lower level of IT readiness such as IT infrastructure and finanacial readiness. However, innovation characteristics such as relative

advantage and perceived risk, ability to use IOS and all environmental characteristics do not show the statistically significant differences.

The differences of IT infrastructure and perceived financial cost show that there are clear differences of IT readiness between two groups. The differences of compatibility and complexity can explain that, as the adopter group has its own direct experience of IOS use, it may decrease the negative effects, compared with non-adopter.

Although some variables do not show the statistically significant differences, we can see that adopter group shows the higher level of positive influencing factors except environmental characteristics and non-adopter group has the higher level of negative effects. It means that adopter's direct experience can have the learning effect of IOS usage and thus can have more ability to overcome some problems on the process of implementation.

4 Conclusion

The adoption and successful implementation of new innovation technology such as IOS in SMFs can play an important role in increasing their competitive power. Also, it requires well-planned organizational behaviors and planning. To develop strategic planning, better understanding for various characteristics of SMFs is required. According to the results of this study, non-adopter's environments and conditions of decision-making on IT investment and usage are different from adopter's, and the different factors have the different influences on IOS adoption compared with adopters.

In spite of several limitations, this study may provide some backgrounds to explain the differences between adopter and non-adopter in IT adoption and implementation. This study is rather an exploratory one in the sense that data were collected from limited samples. Further studies with larger sample size will produce lots of valuable discussions on the differences between adopter and non-adopter and the moderating effect of computer self-efficacy.

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