

The Empirical Study on the Success Factors of IT Adoption in Korea Service Industry

Jin Soo Kim* · Hoe Gneung Ka** · In Ho Hwang**

Abstract

This study is to present effective ways of IT adoption as a new growth engine for vitalizing service industry. The paper identifies key success factors of IT adoption and analyzes empirically its' impact on user satisfaction. Additional analysis of control effect by company sizes is conducted. For data sampling, among 1590 companies in IT systems, equipment, and software, 1570 companies participated and total 2,000 questionnaires were collected. In order to analyze main effect analysis and control effect, Structural Equation Modeling method was applied. The result show that there are significant effect between key success factors and user satisfaction. Based on the result, the paper suggests effective way of IT adoption according to company sizes.

Keywords : Service Industry, IT Adoption, Success Factors, User's Satisfaction

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* 1st Author, Professor at School of Business, Chung-Ang University, e-mail : sunny@cau.ac.kr

** Ph.D. Candidate at Graduate School of Business Administration, Chung-Ang University

1. Introduction

Recently Korea service industry was recognized as a secondary industry of manufacturing. This industry has attracted many attentions as a new growth engine for the future. Changes in the environment such as the advent of knowledge-based economy, rapid development of telecommunication, the internet today, and global service marketing promotes service competition and accelerates the creation of a new service concept.

Using IT in the service sector to improve service competitiveness practices are appearing recently in domestic and international. However, IT investments for value-added difficulties are appearing to these sectors. The study for the key success factors of IT adoption in the traditional manufacturing field has been an ongoing process. In contrast, the study for the key success factors and user satisfaction in service industry is insufficient.

In addition, since successful case studies of IT adoption focus is not on small businesses, but rather corporation-size companies, IT adoption issues in small businesses that may occur during the introduction are not considered appropriately.

The objective of this paper is to analyze the user satisfaction of the key success factors for IT adoption in the service industry. The scale differences are analyzed by the scale of enterprise as control variables to examine its' effectiveness. For data sampling, multi-stage stratified sampling method was conducted. Among 1590 companies in IT systems, equipment, and

software, 1570 companies participated and total 2,000 questionnaires were collected. In order to analyze main effect analysis and control effect, Structural Equation Modeling method was conducted.

The result shows that there are significant relationship between key success factors and user satisfaction. Based on the result, the paper suggests effective ways of IT adoption according to company sizes, resulting in improvement of competitiveness of service industry.

2. Theoretical Background

2.1 Service Industry

IBM defines service as "A service is a provider/client interaction that creates and captures value" [2006]. In addition, the characteristic of service is described as intangibility, inseparability, simultaneity, and variability [Alter, 2008]. Service industries are very important in order to strengthen the growth potential for countries and create value-added jobs [Clarke and Nilsson, 2008; Miles, 2008]. Domestic service industry has brought a continuous external development over the past years. However, the external development has led to the persistent deficits and the decline of export share in service sector. Compared to the growth of IT utilization directly related to value-added sector, external development growth is too low due to small size of service industry. To solve these problems, the information technology could be strategically applied to enhance productivity and economic growth.

2.2 IT Success Factors in Service Industry

(1) System Quality

Igbaria and Nachman [1990] examine whether inter-related factors related to the system success are affected to user satisfactions. He shows that if users have difficulty in accessing computers and lack of the available resources, they would be dissatisfied. Yadav [1985] classifies nature of information system by structural characteristics, information structure, and information property.

Bailey and Pearson [1983] measure the quality of information system by using variables such as ease of access, system flexibility, system integration, and response time.

Belardo, Karwan, and Wallace [1982] measure the system characteristics by using variables such as reliability, response time, ease of use and ease of learning. In other words, the system flexibility can measure the system quality and improve IT performance. In this study, the system quality means reliability, response time, ease of use and ease of learning.

(2) CEO Support

Chief Executive Officers are responsible for providing general guidelines about information system activities. Support and participation of the CEOs are a critical factor on the performance of the information system [Willoughby and Pye, 1977]. In addition CEO must be able to evaluate individual project and understand the organization's requirements for information systems [Cerullo, 1980].

Even if CEOs decide to make purchases com-

puter systems, lack of support from CEOs implies their low interest in building system. In addition, they would not be involved in the project related to analysis of information requests [Thong, Yap, and Raoman, 1996].

Yi, Nam, and Han [1999] were analysed the corporate using the ERP system. To success ERP system, CEO selected directly a competent workforce to build the system and supported continuously to introduce ERP.

Han and Baek [1999] has verified empirically the factors of the ERP system's performance. They indicate that the success factors of ERP system are the chief executive officer, Enterprise consensus, task appropriateness, user participation and BRP linkage. In summary, CEO's support to information system is being recognized as the success factors of IT adoption. If CEO's support is high at introduction and utilization stage of IT, the system will be succeed.

(3) Organization Education

Davis and Bostrom [1993] addressed education and training for end users are critical factors for successful IT adoption. Igbaria and Nachman [1990] analyzed the education effect by using 187 end-users samples. They found that user-training is significantly related to the user's favorable attitude as well as system utilization, end-user satisfaction, and cognitive efficiency.

Barki and Hartwich [1994] found that the users participation was positively related to user satisfaction. Baronas and Louis [1988] also found that the more system user groups involved in the development process, the more user satisfaction were increased.

(4) Information Quality

Davis and Olson [1985] defined that information is the form of meaningful data for receiver. Ahituv [1980] addressed that information quality is a very important factor to user satisfaction.

However, information quality can be defined variously. Ahituv explained the value of information in terms of the accuracy, timeliness, relevance, integration, and forms.

DeLone and McLean [1992] showed that the quality of information is quite subjective according to user's view. Gordon, Lacker and Tuggle [1978] provided that information reporting system's difference such as forms, integration, source, time and frequency of information are important quality variables.

Managaliso [1995] provided that range of information, timeliness of information, and a summary of information are also important to information quality. In this study, the information quality means timeliness of the information, accuracy and ease of understand.

2.3 Satisfaction of IT Usage

Satisfaction is a degree of information system's trust meeting the information needs of users [Ives et al., 1998]. Many researchers defined IT user satisfaction by task efficiency [Doo Jin K. 2004; Seddon and Kiew, 1994; Seddon, 1997; Delone and Mclean, 1992; Mi young K., 2001] and cost reduction [Young, Shields and Wolf, 1988; Husing et al., 1997], and service quality [Jang and Kang, 2002].

(1) Task Efficiency

Seddon and Kiew [1994] indicate that the degree of trust and reinforcing task outcome has close relationship with recognized availability. Delone and Mclean [1992] suggested the system and user satisfaction model through work satisfaction, compatibility of system, and efficiency of decision making.

In this study, work efficiency means improve business productivity, improve business performance, enhance collaboration and speed decision-making.

(2) Cost Reduction

In terms of cost, it would be divided into outcome of original cost and outcome of profitability and growth. According to Young, Shields, and Wolf [1988], cost reduction factors through ERP leads to direct cost savings, increased turnover of exhaustion of stocks, and the average reduction of scrap. It also improves quality of product technology, performance, and will reduce the production time.

Husing et al. [1997] found ERP system performance metrics such as inventory costs, stock holding period, the quality of a reject rates sales per employee, scrap materials, the organization lean, and maintenance costs.

In this study, cost reduction means increase sales, operations and maintenance costs reduction and labor cost reduction.

(3) Service Quality

In general, service quality is a subjective value rather than an objective value. Service quality can be defined as customer's perception [Rorn-

roos 1983; Zeithami, 1998]. Lehtinen [1982] indicating that service quality is generated through interactions between various organizational factors and customers.

Pearasuraman et al. [1988] defined service quality is judgement and attitudes and suggested that service quality is composed of five factors such as tangible, reliability, responsiveness, assurance, empathy

In this study, service quality means enhance the corporate image, enhance customer satisfaction and new customer creation.

2.3 Characteristics of Service Industry Size

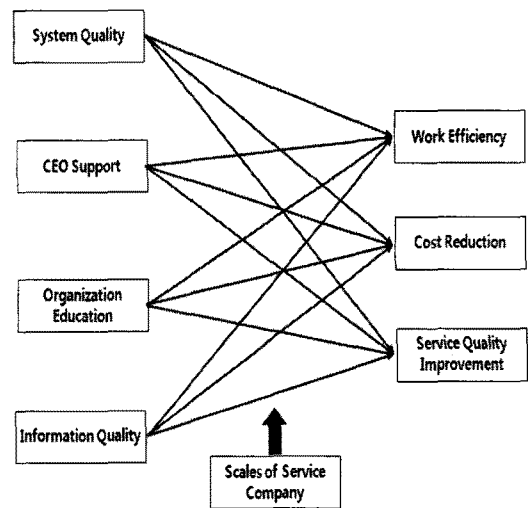
Depending on the size of organization, impact of information systems can be different. If the size of an organization is larger, influence for entire organization can be limited. On the other hand, if the size of an organization is smaller, impact to whole organization is much higher.

Park [2002] defined the cost saving and efficiency of ERP systems would be different in terms of organization size. They showed that the satisfaction of IT usage could be different depends on the size of service industries.

3. Research Model and Variables

3.1 Research Model

This study analyzes the influence relationship of success factors and user's satisfaction when service industry adopts IT systems. Above all, control variable depends on the size of service companies. The model of the study is as follows.



〈Figure 1〉 Research Model

3.2 Research Variables

(1) Main Path Analysis Variables

Analysis of main effects is to analyze complex relationships between IT critical success factors and satisfaction with IT use in the service industry. Research hypothesis are as follows.

- H1 : System quality will affect positively on task efficiency.
- H2 : System quality will affect positively on cost reduction.
- H3 : System quality will affect positively on improvement of service quality.
- H4 : CEO's support will affect positively on task efficiency.
- H5 : CEO's support will affect positively on cost reduction.
- H6 : CEO's support will affect positively on improvement of service quality.
- H7 : Organizational education will affect positively on task efficiency.

- H8 : Organizational education will affect positively on cost reduction.
- H9 : Organizational education will affect positively on improvement of service quality.
- H10 : Quality of information will positively affect on task efficiency.
- H11 : Quality of information will positively affect on cost reduction.
- H12 : Quality of information will positively affect on improvement of service quality.

(2) Moderator Effect Variables

Analysis of moderating effect is to analyze relative influence between IT success factors and satisfaction with IT use in terms of company size.

- H13 : Company size will have moderating effect on IT user's satisfaction.

4. Data Collection and Analysis

4.1 Data Collecting Method

Multi-Stage Stratified Sampling method was conducted and data collection process were conducted during August of 2009. Among 1590 companies in IT systems, equipment, and software, 1570 companies participated and total 2,000 questionnaires were collected.

The demographic characteristics of survey participants are <Table1>.

This study was conducted based on theoretical and empirical research. Theoretical studies were summarized by national and international research findings and were set up foundation of research model and hypotheses for empirical research. Variables and questionnaires were developed based on the literature review.

<Table 1> Demographics of the Study Participants

Region		Frequency	Number of employees		Frequency														
Gangwongwon	Ganwon	56	Less than 10	1,071															
	Gyeonggi	197	10~50	303															
Gyeonggigwon	Seoul	594	50~100	58															
	Incheon	45	100~200	45															
Youngnamgwon	Gyeongnam	68	200 or more	93															
	Gyeonbuk	68	Total	1,570															
	Deagu	67	<table border="1"> <thead> <tr> <th>Type of Company</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>Franchise</td> <td>468</td> </tr> <tr> <td>Main branch</td> <td>55</td> </tr> <tr> <td>Single entity</td> <td>941</td> </tr> <tr> <td>And so on</td> <td>34</td> </tr> <tr> <td>No Response</td> <td>72</td> </tr> <tr> <td>Total</td> <td>1,570</td> </tr> </tbody> </table>			Type of Company	Frequency	Franchise	468	Main branch	55	Single entity	941	And so on	34	No Response	72	Total	1,570
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	Franchise	468																	
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Total	1,570																		
Busan	123																		
Ulsan	32																		
Daajeon	41																		
Chungcheong	Chungnam	39																	
	Chungbuk	39																	
Honamgwon	Guangzhou	57																	
	Chonnam	39																	
	Chonbuk	68																	
	Jeju	37																	
Total		1,570																	

SPSS 12.0 was used to analyze the data. Cronbach's alpha coefficients were used for Internal Consistency Analysis. Factor Analysis was conducted for validation purpose. In order to analyze main effect of analysis and control effect, Structural Equation Modeling method was conducted.

4.2 Empirical Validation of Structural Model

(1) Reliability and Validity Analysis

According to the result of factor analysis in <Figure 2>, cronbach's alpha values indicate

above 0.9, showing high internal consistency,

<Table 3> Model Validity Result

	P	X ² /df	CFI	AGFI	PNFI
Analysis Result	0.000	17.682	0.831	0.780	0.756
Valid Value	P < 0.05	X ² /df < 5	CFI > 0.9	AGFI > 0.8	PNFI > 0.6
	PGFI	RMR	NFI	RMSEA	
Analysis Result	0.638	0.082	0.903	0.103	
Valid Value	PCFI > 0.6	RMR < 0.05	NFI > 0.9	0.05 < RMSEA < 0.10	

<Table 2> Factor Analysis Result

Variable	Scale Items	1	2	3	4	5	6	7	Chronbach's Alpha
Organization Education	ORG_1	0.870	0.106	0.082	0.130	0.128	0.049	0.118	0.938
	ORG_2	0.850	0.099	0.079	0.123	0.122	0.062	0.097	
	ORG_4	0.834	0.164	0.172	0.196	0.123	0.063	0.053	
	OEG_3	0.810	0.143	0.186	0.192	0.130	0.082	0.045	
Work Efficiency	WORK_2	0.157	0.877	0.055	0.107	0.041	0.225	0.177	0.931
	WORK_1	0.148	0.854	0.044	0.085	0.045	0.243	0.180	
	WORK_4	0.144	0.794	0.045	0.120	0.069	0.222	0.312	
	WORK_3	0.127	0.776	0.048	0.103	0.049	0.222	0.297	
Information Quality	INFO_2	0.196	0.054	0.921	0.040	0.296	0.033	0.041	0.983
	INFO_3	0.223	0.052	0.913	0.052	0.282	0.033	0.042	
	INFO_1	0.202	0.056	0.911	0.045	0.270	0.026	0.029	
CEO Support	CEO_2	0.200	0.131	0.053	0.916	0.037	0.083	0.082	0.923
	CEO_3	0.167	0.098	0.032	0.911	0.040	0.067	0.092	
	CEO_1	0.255	0.097	0.039	0.843	0.084	0.073	0.085	
System Quality	SYS_3	0.213	0.066	0.289	0.043	0.872	0.059	0.027	0.939
	SYS_2	0.223	0.052	0.319	0.047	0.869	0.040	0.044	
	SYS_1	0.238	0.056	0.259	0.090	0.849	0.062	0.061	
Cost Reduction	Cost_2	0.122	0.298	0.033	0.093	0.049	0.870	0.185	0.916
	Cost_3	0.117	0.304	0.025	0.071	0.060	0.854	0.183	
	Cost_1	0.130	0.272	0.038	0.090	0.055	0.778	0.298	
Service Quality Improvement	SERV_3	0.136	0.271	0.044	0.111	0.046	0.232	0.828	0.924
	SERV_1	0.156	0.353	0.029	0.098	0.058	0.231	0.812	
	SERV_2	0.177	0.363	0.046	0.106	0.035	0.231	0.805	

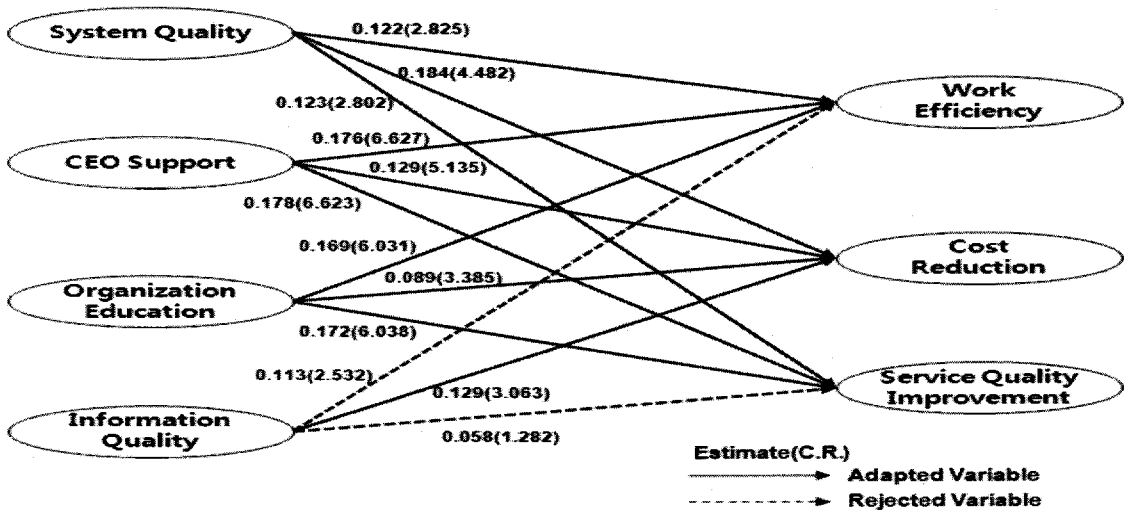
According to validity analysis of model, the values obtained in this study is not satisfactory level, but structural equation to measure the fit was reasonable. <Table 3>.

(2) Empirical Validation of Structural Model

1) Main Path Analysis

Path analysis results is <Figure 2>, <Table

4>. System Quality affects Work Efficiency, Cost Reduction and Service Quality. CEO Support affects Work Efficiency, Cost Reduction and Service Quality. Organization Education affects Work Efficiency, Cost Reduction and Service Quality. Information Quality affects Cost Reduction. But, Information Quality does not significantly affect Work Efficiency and



<Figure 2> Path Analysis Result

<Table 4> Path Effect Analysis Result

Path Effect Analysis		Estimate	S.E.	C.R.	P	Result
System Quality	Work Efficiency	.122	.043	2.825	.005	Adapt
	Cost Reduction	.184	.041	4.482	***	Adapt
	Service Quality	.123	.044	2.802	.005	Adapt
CEO Support	Work Efficiency	.176	.027	6.627	***	Adapt
	Cost Reduction	.129	.025	5.135	***	Adapt
	Service Quality	.178	.027	6.623	***	Adapt
Organization Education	Work Efficiency	.169	.028	6.031	***	Adapt
	Cost Reduction	.089	.026	3.385	***	Adapt
	Service Quality	.172	.028	6.038	***	Adapt
Information Quality	Work Efficiency	.113	.045	2.532	.011	Reject
	Cost Reduction	.129	.042	3.063	.002	Adapt
	Service Quality	.058	.045	1.282	.200	Reject

Note) P < 0.01.

Service Quality.

2) Moderator Effect Analysis

In the study, the result of the control analysis is as follows on <Table 5>.

Company size shows the moderating effect(p = 0.000). Compared to corporate size, small service company is higher overall impact than big service company.

5. Conclusion and Future Research

5.1 Conclusion

In this study, effect of IT success factors for improving IT adoption in service industry was analyzed. Based on previous literature review, research questions and research model are developed.

For empirical analysis, multi-stage stratified sampling was applied for data sampling from

Korea service industry.

The result of statistical analysis are as follows. First, IT usage satisfaction of all were affected by IT Success Factors such as System Quality, CEO Support and Organization. The result is consistent with previous research that Information system affect work efficiency and cost reduction [Seddon and Kiew, 1994, Young, Shields and Wolf, 1988] and service quality [Jang and Gang, 2002]. Information Quality partially affected IT usage satisfaction. Information Quality was not affected significantly to Work Efficiency and Service Quality. The reason is that Information Quality was not considered as a priority at the current poor status of the service industry.

Second, This study analyzed factors affecting User Satisfaction according to the difference in the size of the companies.

The result of the study would provide proper

<Table 5> Moderator Effect Analysis Result

		Small Service Company					Big Service Company				
Moderator Effect Analysis		Estimate	S.E.	C.R.	P	Result	Estimate	S.E.	C.R.	P	Result
System Quality	Work Efficiency	.102	.046	2.219	.027	Adapt	.102	.136	.751	.452	Reject
	Cost Reduction	.176	.044	4.030	***	Adapt	.058	.120	.479	.632	Reject
	Service Quality	.108	.046	2.332	.020	Adapt	.066	.133	.498	.618	Reject
CEO Support	Work Efficiency	.158	.028	5.594	***	Adapt	.258	.085	3.044	.002	Adapt
	Cost Reduction	.118	.027	4.402	***	Adapt	.104	.075	1.389	.165	Reject
	Service Quality	.153	.029	5.360	***	Adapt	.359	.084	4.293	***	Adapt
Organization Education	Work Efficiency	.154	.030	5.194	***	Adapt	.328	.103	3.200	.001	Adapt
	Cost Reduction	.068	.028	2.438	.015	Adapt	.291	.093	3.140	.002	Adapt
	Service Quality	.164	.030	5.460	***	Adapt	.265	.100	2.656	.008	Adapt
Information Quality	Work Efficiency	.131	.047	2.798	.005	Adapt	-.023	.150	-.151	.880	Reject
	Cost Reduction	.149	.044	3.354	***	Adapt	-.009	.133	-.068	.946	Reject
	Service Quality	.052	.047	1.104	.270	Reject	.230	.147	1.563	.118	Reject

Note) P < 0.05.

suggestions for making strategies that could improve IT satisfaction in service industry.

First, CEO Support and Organization Education were influenced higher than other IT success factors. When information system are applied to a service company, CEO Support and Organization Education are very important success factors.

Second, company size has the moderating effect. In small sized service companies, CEO Support and Organization Education were influenced higher than other IT success factors. But, Organization Education were influenced higher than other IT success factors at big sized companies. So, it is necessary to emphasize different aspects for introduction strategy of information systems by company size.

5.2 Future Research

The limits and future research directions are as follows.

First, this study analyzed the critical success factors of IT adoption in service industry. However, the success factors are limited for analysis purpose. To find out more exact result, more factors should be considered.

Second, this study analyzed the influence gap of IT usage satisfaction by company size. But Company size dose not represent the characteristics of the service industry. So, Using a variety of control variables to find the characteristics of service industries is needed.

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■ Author Profile



Jinsoo Kim

Jinsoo Kim is professor of MIS at Chung-Ang University, Korea. He holds a BA from Yonsei University, an MBA from University of Texas (Arlington), and Ph.D. in MIS from Louisiana State University. He is also working as the Chairman of Korea Database Society and the director of graduate school of entrepreneurship at Chung-Ang University. His research interests include database modeling, u-biz strategy, and entrepreneurship.



Hoikwang Ka

Hoikwang Ka is a Ph.D. candidate in Management Information System at Chung-Ang University. His current research interests include service science and information system.



In Ho Hwang

In Ho Hwang is a Ph.D. candidate in Management Information System at Chung-Ang University. His current research interests include IT Convergence, IT Business Model, and Contents.