Empirical Investigation on Factors Affecting User Satisfaction of E-Government Service

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전자정부 서비스의 사용만족에 영향을 미치는 요인에 관한 실증연구

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요 약

인터넷의 사용증가는 전자정부 서비스 성장의 주요한 촉매제 역할을 하고 있다. 이러한 전자정부 서비스의 증가에도 불구하고 사용자 만족에 대한 실증적인 연구는 시작단계이다. 본 연구에서는 실증 분석결과 전자정부 서비스 만족에 영향을 미치는 6가지 요인을 도출할 수 있었다. 즉, 전자정부 서비스의 구성(formation), 기능성(function), 신뢰성(reliability), 시각성(visibility), 효율성(efficiency), 그리고 지속성(substantiality)이라는 요인이다. 본 연구는 전자정부 서비스를 기획하고 구현하는데 주요한 지침으로 활용될 수 있을 것이다. 그리고 본 연구의 실증분석 결과 도출된 전자정부 서비스 만족에 영향을 미치는 6가지 요인은 한국의 전자정부 서비스의 향상과 정책에 주요한 시사점을 제공할 것 이다.

Key word : 전자정부서비스, 사용자 만족, 서비스 구성, 기능성, 신뢰성, 시각성, 효율성, 지속성

1. Introduction

The global diffusion of Internet technology has enabled governments to offer their services electronically (Hung et al., 2006; Janssen et al., 2008). Internet e characteristics, such as speed and geographical range, enhance access to government information services, and provide new ways of interacting with citizens (Kumar and Best, 2006; Vassilakis et al., 2007; Badri and Alshare, 2008). In Korea, for example, the administrative offices of national and local government have supplied electronic information services from 1998.

However, e-government service does not always meet the expectations of the public[8]. Hung et al. (2006) proposes that it is the non-profit and oligopoly aspects of public services that are responsible for lack of satisfaction Current research seeks to understand the links between user expectations, service quality and user satisfaction[5][8]. Kumar and Best[9] propose that the quality of e-government service positively affects volume of use, and user satisfaction.

This paper examines the Degree of e-government service and user preferences. After that, this research attempts to identify core factors influencing user satisfaction of e-government service.

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2. Background

2.1 Overview of e-Government Service

E-government researchers have adopted different approaches based on the application studied and the objectives, values and perspectives of the researcher.. Lowery[10] views e-government as on-line government administration services delivered electronically to citizens. The World Market Research carter & Belanger(2005) defines electronic government as the provision of both traditional and innovative information services via the Internet. Goucos (2001) views e-government as a new form of government enabled by the strategic use of Internet technology[2].

Electronic delivery of traditional government services enhances access and service quality[1][2][8][9]. Wired and wireless Internet connections enable both traditional and innovative government services to be provided to all geographic locations, 24 hours per day/7 days per week[6]. Moreover it is possible to conduct a high level of services at low cost[9].

In addition to increased service quality and reduced cost, the benefits of e-government include increased accountability and transparency, reduced information inequality and corruption, greater convenience and citizen involvement[1][2][6][13][14]. In total, these benefits enable new forms of government that more closely approximate the ideal democracy[1].

2.2 Review of Service Quality Evaluation

In profit-making enterprises, the perceived quality of products and services drives user satisfaction and intention to use/purchase[13]. In e-government, the perceived quality of electronic information and electronic services drives citizen satisfaction and intention to use[1]. While the perceived quality of e-government information services is important[8], its measurement is not without difficulty[6].

Users' perceptions of service quality depend on a variety of factors, and are evaluated on multi-dimensional scales. After extensive review of the dimensions measured in previous research,

Parasuraman[11] developed a set of dimensions, SERVQUAL, that measure both expectations and perception of service quality. SERVQUAL is one of the first attempts to provide a universal methodology and measure for service quality and is still in widespread use. SERVQUAL is a multi-item scale developed to assess customer perceptions of service quality in service and retail businesses[11].

However, many authors, including Cronin & Taylor (1992) assert that the constructs in SERVQUAL are not universal, and the measure lacks convergent, discriminant and predictive validity[3]. These critics assert that SERVQUAL cannot distinguish clearly the core concepts of satisfaction and service quality. Pitt et al (1995) asserted importance of 'service' in information systems and reports in positive terms on the value of SERVQUAL for evaluating efficiency[12]. Dyke et al (1997) and Kettinger & Lee (1997) questioned the universal applicability of SERVQUAL in business and presented more appropriate methods for measuring service quality in information systems[4][7]. Recently, Carter and Belanger (2005) examine the factor of citizens' intention to use e-government services[2]. They argued that perceived ease of use, compatibility and trustworthiness are significant indicators of citizens' intention to use e-government services.

E-government service quality is what the users perceive during use (Kumar and Best, 2006; Badri and Alshare, 2008)[1][9]. Despite the growing use of e-government by citizens, the issue of service quality has not been addressed in the context of service satisfaction (Koh et al., 2008)[8]. The objective of this research is to enhance our understanding of factors affecting e-government service.

3. Empirical Investigation

3.1 Research Model and Hypothesis

In this paper, <Figure 1> builds on the review of previous literature and indicates the research model for this study. Previous research focused on the user acceptance of e-government services(Tung and Rieck,

2005)[13], the utilization of e-government services (Carter and Belanger, 2005)[2], and the adoption of e-government service(Hung et al. 2006)[5]. The focus of the previous academic literature on e-government services has focused on the user acceptance of e-government services rather than the user satisfaction. Therefore, an empirical investigation of factors influencing user satisfaction of

e-government service is needed to assist governments in improving the effectiveness and quality of e-government services. In relation to this, the following hypothesis is proposed to identify determinants of user satisfaction of e-government service:

Hypothesis. There will be factors that affect user satisfaction of e-government service.

⟨Figure 1⟩ Research Model

This research was exploratory in nature. Following a literature review, several issues that affect user satisfaction for e-government service were identified,

as can be seen in ⟨Table 1⟩. In addition, an exploratory survey was conducted to gather more information on this issue.

⟨Table 1⟩ e-Government Service Issue

e-Government Service Issues	References
• Hardware and software technology infrastructure • Visual appearance of the website • Visual cues that identify information service functions • Faithful implementation of promised services • Helpfulness in problem resolution • Reliability of the website • Provision of promised information and service • Information accuracy • Information comprehensiveness • Speed of response • Help functions • Speed in answering user questions and inquiries • Reliability of technical support personnel • Reliability of information and transaction processing. • Politeness of service personnel • Competency of service personnel • Provision of specific services. • Ability of service personnel to provide the specific knowledge that the user requires • Empathy of service personnel with user's expectations and desires • Empathy of service personnel with user's information requirements • Preparedness to engage with the user • Time savings by use of e-government services • Effort reduction by use of e-government services • Convenience in information searching • Ease of use of e-government information services • Electronic discussions and related community services • Provision of essential information andservices • Transparency and accountability that reduces irregularity and corruption in government service provision	Bari and Ashore (2008) Carter and Belanger (2005) Hung et al. (2006) Janssen et al. (2008) Koh et al. (2008) Kumar and Best (2006) Parasuraman (1988) Pitt et al. (1995) Tung and Rieck (2005) Vassilakis et al. (2007)

3.2 Descriptive Analysis

In order to evaluate Korean e-government service quality and examine important properties of e-government service, we surveyed 500 Korean under graduate and graduate students. Of the 500 administrated questionnaires, 475 were completed and used in the analysis. The ages of the participators ranged from 20 to 30 years, with males accounting for 54.1% of the sample.

〈Table 2〉 e-Government Service Evaluation (n=475)

e-Government Service Items	Average	Rank
Degree of hardware and software technology infrastructure	5.84	17
Degree of visual appearance of the website	5.69	22
Degree of visual cues that identify information service functions	5.42	27
Degree of faithful implementation of promised services	6.20	2
Degree of helpfulness in problem resolution	5.93	12
Degree of reliability of the website	6.32	1
Degree of provision of promised information and service	5.97	10
Degree of information accuracy	5.82	18
Degree of information comprehensiveness	5.88	16
Degree of speed of response	5.94	11
Degree of 'help' functions	5.93	12
Degree of speed in answering user questions and inquiries	5.93	12
Degree of reliability of technical support personnel	5.99	9
Degree of reliability of information and transaction processing.	6.13	3
Degree of politeness of service personnel	5.70	21
Degree of competency of service personnel	6.13	3
Degree of provision of specific services.	5.55	23
Degree of ability of service personnel to provide the specific knowledge that the user requires	5.72	20
Degree of empathy of service personnel with user's expectations and desires	5.52	25
Degree of empathy of service personnel with user's information requirements	5.45	26
Degree of preparedness to engage with the user	5.77	19
Degree of time savings by use of e-government services	6.10	5
Degree of effort reduction by use of e-government services	6.09	6
Degree of convenience in information searching	6.03	8
Degree of ease of use of e-government information services	6.06	7
Degree of electronic discussions and related community services	5.30	28
Degree of provision of essential information andservices	5.53	24
Degree of transparency and accountability that reduces irregularity and corruption in government service provision	5.90	15

Survey participants were encouraged to visit various e-government websites[1] and to evaluate the degree of e-government service. Furthermore, survey participants were asked to describe good service items

1) www.freeway.co.kr www.cyber.seoul.kr minwon. molab.go.kr; www.nl.go.kr www.news.go.kr www. etri.re.kr; www.nanet.go.kr, home.nec.go.kr www. coti.go.kr; www.pps.go.kr www.nis.go.kr www. npc or.kr; cyber.coti.go.kr; www.nis.go.kr et al.

of each site. The websites recommended to students were reputed to provide useful services to citizens. As shown in <Table 2>, 28 e-government service items, which were selected by literature review and domestic e-government website review, was evaluated.

Survey participants rated the degree of all the services items of e-government between 5.30 and 6.30. <Table 2> lists the average rating, and the rank, of each item. The top six ranked items are: 1) Degree of reliability of website, 2) Degree of faithful implementation of promised services, 3) Degree of reliability of information and transaction processing, 4)

Degree of competency of service personnel, 5) Degree of time savings by use of e-government services, 6) Degree of effort reduction by use of e-government services.

3.3 Factor Analysis

Principle component factor analysis was used to evaluate the degree to which the 28 items of e-government service quality clustered into separate groups. Six group factors with eigenvalues greater than 1.0 were found.

〈Table 3〉 Result of Factor Analysis

Factor	Measurement Items	Factor accumulation	Eigen-value	Accumulation diversify ratio
Factor 1 (e-Service Formation)	Degree of empathy of service personnel with user's expectations and desires	.787	9.658	38.633
	Degree of empathy of service personnel with user's information requirements	.764		
	Degree of provision of specific services.	.700		
	Degree of electronic discussions and related community services	.687		
	Degree of provision of essential information andservices	.625		
	Degree of ability of service personnel to provide the specific knowledge that the user requires	.546		
Factor 2 (e-Service Function)	Degree of 'help' functions	.809	2.177	47.341
	Degree of helpfulness in problem resolution	.788		
	Degree of speed of response	.605		
	Degree of provision of promised information and service	.582		
Factor 3 (e-Service Reliability)	Degree of competancy of service personnel	.763	1.637	53.890
	Degree of politeness of service personnel	.763		
	Degree of reliability of information and transaction processing	.748		
	Degree of reliability of technical support personnel	.586		
Factor 4 (e-Service Visibility)	Degree of visual appearance of the website	.802	1.472	59.777
	Degree of visual cues that identify information service functions	.752		
	Degree of hardware and software technology infrastructure	.626		
Factor 5 (e-Service Efficiency)	Degree of convenience in information searching	.756	1.203	64.589
	Degree of effort reduction by use of e-government services	.707		
	Degree of time savings by use of e-government services	.690		
	Degree of ease of use of e-government information services	.623		
Factor 6 (e-Service Substantiality)	Degree of faithful implementation of promised services	.807	1.040	68.750
	Degree of reliability of the website	.613		
	Degree of information accuracy	.553		
Dependent Variable	Degree of user satisfaction while using e-government services	.920	1.691	84.552
	Degree of user satisfaction after using e-government services	.910		

The 25 items included in the six factors all had loadings greater than 0.5. The factors were labeled as follows: e-service formation, e-service function, e-service reliability, e-service visibility, e-service efficiency, and e-service substantiality. In order to verify the internal validity of the factors, the items were subject to reliability analysis. <Table 4> reports that the items for each of the six factors had Cronbach's α values greater than 0.5, indicating relatively high reliability.

<Table 4> Reliability Analysis

Factor	Number of Factor	Cronbach's α
e-Service Formation	6	.8798
e-Service Function	4	.8613
e-Service Reliability	4	.8527
e-Service Visibility	3	.7816
e-Service Efficiency	4	.7863
e-Service Substantiality	4	.8105
Dependent Variable	2	.8095

3.4 Regression Analysis

A regression analysis was conducted to examine the relationship between six group factors and user satisfaction as a dependent variable, according to mean value. The results presented in <Table 5> show all the factors significantly affect user satisfaction of e-government service.

<Table 5> Results of Regression Analysis

Independent Variable	Std. Beta	T	Sig.	R^2	Adjusted R^2
e-Service Formation	.222	5.812	..000	.311*	.302*
e-Service Function	.161	4.226	.000		
e-Service Reliability	-.101	-2.648	.008		
e-Service Visibility	.172	4.516	.004		
e-Service Efficiency	.407	10.652	.000		
e-Service Substantiality	.174	4.560	.000		

4. Conclusion

Unlike offline government services, e-government websites offer citizens a new service experience. Currently, users pay considerable attention to the quality of the services provided on the Internet. Consequently, there is a need to understand the aspects of service quality that lead to satisfaction. Our empirical study identified six factors that influence user satisfaction of an e-government service: 'e-service formation', 'e-service function', 'e-service reliability', 'e-service visibility', 'e-service efficiency', and 'e-service substantiality'.

Since previous research tends to focus on the user acceptance of e-government services (e.g. Hung et al., 2006)[5] or the adoption of e-government services (e.g. Tung and Rieck, 2005)[13], this study represents an exploratory attempt to empirically address the factors that affect user satisfaction for e-government services. Our research provides an academic foundation for more detailed thinking, theorizing, and testing of such ideas, and the results of the study will provide a theoretical foundation for further research. These findings may also assist in the design and implementation of

e-government services.

The study has limitations. Due to its pioneering and exploratory nature, the findings are descriptive rather than definitive. Further research using more sophisticated statistical techniques is required to test the validity of our six factors For example, developing additional measures for e-government service and empirically testing them against the factors we identified may yield useful insights. We also envisage that our findings will prove beneficial in the ongoing research into the links between e-government service and user satisfaction.

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