

# 이용자 만족에 영향을 미치는 Government 2.0 서비스 품질 요인에 관한 연구<sup>☆</sup>

## Analyzing Service Quality Factors for Affecting Government 2.0 Users' Satisfaction

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### 요 약

본 연구의 목적은 Government 2.0 서비스 품질을 측정하고 이것이 이용자 만족에 어떠한 영향을 미치는지 분석하고 서비스 활성화 방향을 모색하는 것이다. 최근 정부 서비스와 Web 2.0이 결합한 용어인 Government 2.0이 새로운 패러다임으로 부상함에 따라 공공정보의 공개와 활용을 통한 가치창출에 대한 관심이 커지고 있다. 그러나, Government 2.0이 경제, 사회, 문화 전반에 미치는 여러 가지 영향에 대한 연구는 극히 미흡한 실정이다. 또한, Government 2.0 서비스와 관련된 학문적 분석이나 평가에 관한 연구도 미미한 실정이다. 서비스 품질 평가는 일반적으로 이용자 만족을 선행지수로 선택하므로, 본 연구에서도 대중교통정보서비스를 중심으로 한 Government 2.0 서비스에 기존의 SERVQUAL과 E-S-QUAL 모형의 서비스 품질 결정 요인들이 적용될 수 있는지를 살펴 보았다. 설문을 통한 실증 연구 결과, 서비스 품질이 이용자 만족과 관련이 있는 것으로 나타났다. 특히, 서비스 품질 결정 요인들 중 유형성, 효율성, 신뢰성 3개 서비스 품질 요인들이 이용자 만족에 유의적인 정 영향을 미치는 것으로 나타났다. 본 연구는 Government 2.0 서비스에 대한 경험적 분석을 통해 이론적 모형을 제시함으로써 Government 2.0 서비스 품질에 대한 이론적 토대를 마련한다는 점에서 중요한 의의를 지닌다.

### ABSTRACT

The purpose of this study is to present the direction of improving the Korean Government 2.0 services by evaluating the quality of the service and analyzing its effects on user satisfaction. Recently, on the extension of e-government, Government 2.0, which is the government service combined with Web 2.0, has emerged as a new paradigm. However, there are very few studies on the impact of Government 2.0 on general society and industries. Especially, there is little or no practical analysis and evaluation for the quality of Government 2.0 service. Because the service quality is typically used as the leading indicator of user satisfaction, this study applies it to the Government 2.0 for the validation of the existing theory in a particular subject. The service quality was measured by the tangibles, reliability, responsiveness of revised SERVQUAL, the efficiency and security of the E-S-QUAL. In conclusion, this study has empirically significant implications for providing a theoretical foundation for measuring the quality of the Government 2.0 service.

□ keyword : Government 2.0, e-Government, Service Quality, Satisfaction, Public Transportation Information Service, SERVQUAL, E-S-QUAL

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## 1. Introduction

The extension of e-government, Government 2.0, which is the recent government service combined with Web 2.0, has emerged as a new paradigm and there is growing interest in the value of releasing public information and how it is used. The world's major countries, such as USA, UK, and Australia, are already renovating their systems to release public information and promote the release of public information such as population, crime, health, etc. through their representative portal web site[1].

Korean e-Government, ranked number one in the UN Global e-Government Survey 2010, has been recognized as top class of the world. However, even Korea, which is considered the world No. 1 e-Government, is still facing the difficulties to progress to the next step through the three key elements of Government 2.0, which are citizen participation, openness, and sharing of public information. Although Korea has actively been promoting the digitization of public information, creating new businesses and developing industries is insufficient by using public information alone. Additionally, existing studies about the impact of Government 2.0 on general society and industry are insufficient.

In addition, services based on public information are experiencing difficulties in commercializing due to a lack of cooperation among ministries and a lack of laws and regulations related to Government 2.0 in Korea. For example, the service developed by a high school student that provides bus information has been blocked by Gyeong-Gi Do(Sep.12.2010). Another service created by an individual user that provides train information has been blocked by Korea Railroad Corporation (Oct.1.2010). Another service created by an individual user which provides

information about gas prices, was blocked by the National Oil Corporation (Oct.2.2010). Currently, some services, using public information that communicates between government and people exists. But various services are not being provided.

To meet such a paradigm shift, this study is to present the implications of invigorating the Korean Government 2.0 services by measuring the service in Korea. The service quality was measured by the tangibles, reliability, responsiveness of revised SERVQUAL[2], the efficiency and security of the E-S-QUAL[3], and by reflecting the characteristics of the study subjects. The survey for the empirical analysis is for experienced users of the service. This study analyzes relationships between variables by measuring the quality of service and user satisfaction.

## 2. Theoretical Background

### 2.1 Government 2.0

#### (1) The Concept of Government 2.0

The emergence of various smart devices, the Web 2.0 trend, which emphasizes openness and sharing, is being applied in a wider scale for the public sector, and there is a change in existing paradigm of existing government which was inclined towards efficiency. As a result, first, there are various channels available to approach the government's policy decision and execution process. Second, there is an increasing level of desire among people to participate in politics and express their views on national matters[4]. Such shift in paradigm has spread around the world, leading to the emergence of the Government 2.0 concept, which shares and uses public information resources, and forms a more open mutual relationship[5].

(Table 1) Applications in Each Class

Classification	1995~2000	2005~2010	2015~2020
	Government 1.0	Government 2.0	Government 3.0
	World Wide Web	Web 2.0	Real World Web
Accessibility	Government Centered	Citizen Centered	Individual Centered
	- First Stop Shop - Single Window (Portal)	- One Stop Shop - Access through intermediary institutions	- My Gov - Individual government services portal
Service	- Providing unidirectional information - Limited disclosure of Information - Temporal and spatial constraints of service - Supply-driven services - Electronic services	- Providing interactive information - Expanding disclosure of information - Mobile services - Convergence service of government and private - Creating new value of services	- Providing personalized information and service - Real-time information disclosure - Uninterrupted service - Intelligence services
Channel	Wired Internet	Wired-wireless Internet	Device Integration of Wired-wireless Internet
Task	Individual Works	Integration of Process	Integration of Service

Source: National Information Society Agency, 2010

Until now, the digital government has brought about epoch-making improvements in terms of function and service, but it has failed to fundamentally change the supplier-user relationship between the government and people. In contrast, Government 2.0 refers to a digital government service by the citizens. In such situation, the government would only serve as a platform that provides basic data and system for public service, with citizens emerging as creative suppliers of public service.

## (2) Major Trends in the Government 2.0

Leading nations that first adopted Government 2.0 are pushing ahead with the reutilization of public information. Countries such as the USA, Britain, and Australia are urging people and civil servants to take part in an online community in order to share public information with the citizens[6]. The respective nations are providing systematic foundations by establishing an exclusive organization for the research

and execution of Government 2.0 policies[7].

In accordance to policy to reveal public information, US President Barack Obama is pushing ahead with Government 2.0 by establishing and managing a 'Data.gov(combined storage of public organization's data),' and 'Recovery.gov (making the budget and performance of each government department public)'. Britain has established 'The Re-Use of Public Sector Information Regulations' in 2005 with accordance to EU's 'European Directive on the Re-Use of Public Sector Information' in 2003. As a result, 'Data.gov.uk' was set up since January 2010, enabling citizens to easily search and reutilize public data[1]. In order to provide and execute policies for Government 2.0, Australia has formed 'Government 2.0 Taskforce,' which consists of experts, and opened up 'Data.australia.gov.uk'[8]. Like this, each country recognizes public information as a national resource with high social and economic value. Also, for a strong policy to open and utilize public information, a systematic promotion at

national-level is taking place.

### (3) South Korea's Government 2.0

Unlike the leading countries, Korea does not have a website that provides public information of government agencies, as Government 2.0 is in its implementation stage.

However, there are efforts at government level to communicate with the citizens, and movement among people to create a new service through the utilization of public information. As a result, preliminary services of Government 2.0 are emerging.

The most common form in Korea is for people to use the government's public information to make an application for smart phones, and distribute it. The most popular service among them is the 'Seoul Bus' application. 'Seoul Bus' is a service that provides real time information on the arrival time of Seoul buses to smart phones, thus people can find out the expected arrival time of each buses for a particular bus stop. This service was a hit with the users and topped the charts in the Apple app store. However, citing 'illegal usage of public information', the service was closed down by Gyunggi-do bus information system. However, due to the request and protest by citizens to make the data public, which soon followed, the service was resumed. This incident sparked interest among people about the usage of public information.

As such, the Government 2.0 service in Korea is still at its initial stages. However, there are activities at government level to open up information to the public and enhance the effectiveness and transparency of business. Currently, there is greater movement by citizens to create new service by using the government's public information rather than the government providing public information using a single site; and this can be said to be catalyzed by

the introduction of smart phones. Recently, the 'Ha-Cheol-e' app, which provides the information on the subway service, appeared, thus all the traffic information on public transport has been reutilized and provided real time.

## 2.2 Service Quality's Level and Characteristics

In order to evaluate the quality of Government 2.0 service, this study has borrowed the variables from research about the existing quality of service. The most representative research on quality of service is Parasuraman's research[9].

Parasuraman has conducted a detailed study on the determinants of quality of service based on the research of Grönroos[9,10]. Through 12 focus group interview, these identified that there is a general standard, regardless of type of service, that customers use to perceive the quality of service, and this was categorized into 10 criteria and called Service Quality Determinants[11]. These 10 criteria are not all independent from each other, so by singling out overlapping measurement methods through quantitative, empirical method, the SERVQUAL model, 22 factors that represent 5 levels (tangibles, reliability, responsiveness, assurance, empathy), was confirmed.

SERVQUAL has been used in various researches to evaluate the quality of service after undergoing supplement and revision. The usefulness of studies using the SERVQUAL model is as follows: First, by identifying the factor that users deem as most important when evaluating a service, the quality of service can be effectively managed[12]. Second, by identifying the level of quality of the competing service through the SERVQUAL model, a comparative analysis can take place, and an appropriate strategy can be established through this.

Third, by using the data obtained through the SERVQUAL model as basis, a differentiated strategy can be designed by categorizing the clients who use the service. Fourth, since the difference between the expectation and perception of a client can be confirmed, greater usefulness can be pursued through efforts to reduce the difference.

### 2.3 Causal Relationship between Service Quality and User Satisfaction

The issue related to user satisfaction and quality is the cause and effect relationship between two concepts. They are the perspective that quality is the leading variable for satisfaction[9,13,14] and perspective that satisfaction is the leading variable for quality[15,16]. Between the two, the perspective that quality of service is the leading factor of customer satisfaction is accepted as more typical viewpoint[17].

In this study, user satisfaction is defined to include the intention to reuse and intention to recommend. To look at the definition of reuse by preceding researchers, McDougall describes it as how much the user wants to reuse the service and recommend it to others[18]. Oliver states that the intent to reuse is that when the customers who are satisfied about a particular service want to use the service again, it means that there is a possibility of reuse[19]. Thus, customer satisfaction affects the behavior after the purchase and intent to reuse. Cronin verified that customer satisfaction had a high correlation with intent to purchase in the research on conceptualization, measurement of quality of service, customer satisfaction, and intent to purchase[14].

Intent to recommend can be defined as the willingness by customers to share their purchase experience, and previous researches deem that

positive words by mouth such as recommendation have positive influence over customer satisfaction [20-22]. Various researches identify positive word of mouth and intent to recommend as the same concept, and that customer satisfaction and dissatisfaction is an important factor that determines the intent to recommend[23]. Government 2.0 services could be classified by 4 types (Table 4).

## 3. Research Model

### 3.1 Hypothesis and Research Model

This study has accepted the viewpoint of previous research on the cause-effect relationship between general quality of service and user satisfaction, and aims to empirically investigate the effect of the perceived quality of Government 2.0 on customer satisfaction. To evaluate the quality of service, the determinants of quality of service for SERVQUAL and E-S-QUAL were used as basis. By removing the overlap of the factors that form the two models, and removing the unnecessary factors to fit the characteristic of the topic of research, the research model like the picture below has been derived. Each factor of corporeality, credibility, reactivity, efficiency, and security, that determines the quality of service was set as independent variables, and customer satisfaction was placed as a dependent variable. Thus, a hypothesis was established as the following:

- H1: The Tangibles factor will have a significant and positive effect on user's satisfaction.
- H2: The Reliability factor will have a significant and positive effect on user's satisfaction.
- H3: The Responsibility factor will have a significant and positive effect on user's satisfaction.
- H4: The Efficiency factor will have a significant

(Table 2) 4 Types of Government 2.0 Service in Korea

Classification		Meaning
Interactive communication	Policy suggestion, participation, and discussion	Suggestion of the public ideas, policy discussions and votes, request for civil complaint
	Improvement of a life environment	Service for citizens through report problems in public places and life environment
Life benefits through public information	Traffic information	Provide information about metropolitan area buses and subways (expected arrival time, location information)
	Weather information	Provide weather forecast and life information connected to weather

(Table 3) Operational Definitions of Variable

Classification		Operational Definition
Independent variable	Tangibles	Design and configuration of service
	Reliability	The ability to provide accurate and reliable service
	Responsiveness	Providing prompt service and willingness to help users
	Efficiency	Simple and appropriate configuration of service and less effort to use service
	Security	Service is safe enough privacy threats
Dependent variable	User Satisfaction	Perceived satisfaction in aspect of users

and positive effect on user's satisfaction.

H5: The Security factor will have a significant and positive effect on user's satisfaction.

### 3.2 Empirical Research Design

The measurement factors of this research was obtained by first, extracting the preliminary factors that were considered usable for this study after considering the various survey factors used in previous researches. Then they were formed into survey contents that were deemed to have the highest level of correlation with the context of the research, according to an investigation on the opinion of experts. As a result, 4 survey factors to evaluate the 'corporeality' variable, 3 factors to evaluate the variable of 'credibility', 6 factors to evaluate the variable of 'reactivity', 4 factors to

evaluate the variable of 'efficiency', and 3 factors to evaluate the variable of 'security' were selected, and the likert 9 point scale was used for every factor. Also, in order to evaluate the concept of 'user satisfaction', 6 factors of evaluation were selected. This study selected only those who have the experience of using Government 2.0 service for the survey. This study tried to conduct a comparison analysis on the 4 types of Government 2.0 service categorized in chapter 2, however obtained the minimum sample that only 'Traffic Information Service' could use. The definition and measurement factors of the variables used in this study are as in Table 3 below.

(Table 4) Characteristics of the Sample

Classification	Option	Frequency	Rate(%)
Recognizing the Concept of Government 2.0	① Yes	72	61.0
	② No	46	39.0
Means of Use	① Smart Phone's Apps	104	88.1
	② Web	10	8.5
	③ Mobile Web	4	3.4
Place of Use	① Home	3	2.5
	② In the Movement	103	87.3
	③ Work place	11	9.3
	④ Public Place	1	0.8
Service Recognition Path	① Newspapers/Magazines	2	1.7
	② TV/Radio	2	1.7
	③ Internet	44	37.3
	④ Service Provider	6	5.1
	⑤ Encouragement of friends	34	28.8
	⑥ Search yourself	30	25.4
Owning a Smart Device	① Yes	108	91.5
	② No	10	8.5
Frequency of Use	① Several times a day	48	40.7
	② Once a day	23	19.5
	③ Once a week	37	31.4
	④ Once a Month	5	4.2
	⑤ Not often use	5	4.2
Average Times of Service Usage for a Day (if you choose several times a day)	① Less than 15 minutes	57	48.3
	② 15~30 minutes	19	16.1
	③ 30~45 minutes	1	0.8
	④ 45~60 minutes	0	0
	⑤ More than 1 hour	1	0.8
	⑥ Not applicable	40	33.9

#### 4. Experimental Classification Results and Analysis

In this study, PLS(Partial Least Squares) regression was used for data analysis. The PLS is most appropriate for the theoretical study in the initial stage compare to structural equation modeling methods such as LISREL, EQS, AMOS. Also, it is suitable for small sample size[23]. According to[24], PLS is the right tool for both the studies of social phenomena and the information systems organization. It is also a useful tool to predict causality rather than

to verify the theory. This study is the initial phase of establishing the theory and about a new paradigm, Government 2.0. The purpose of this study is also to predict a causal relationship. Considering these features, the use of PLS in this study is suitable for data analysis.

There are several criteria for the minimum number of samples for PLS analysis. The criterion which is mainly used to the analysis is that “the number of samples must be at least 10 times of the largest number of measurement items of a variable”[25]. Both variables of tangibles and assurance have 4

measurement items. Therefore, 118 samples used in the analysis can be proper.

#### 4.1 Characteristics of the Sample

To analyze the characteristics of the sample, frequency analysis was carried out. Because 61% of the samples understood the concept of Government 2.0 and 91% of the samples had a smart device, the samples were judged to be appropriate for the empirical analysis. According to the service recognition path, “Newspapers/magazines” and “TV/radio” were less than 4%. It implies that the promotion of Government 2.0 service through “the Internet” (37%) may be more appropriate than “Newspapers/magazines” and “TV/radio”. In addition, the recommendation of friends (29%) shows the importance of word of mouth. The fact known by means and places of use is that most of users utilized the service through a smartphone application (88%) and they need the service at the outside. For specific information on the frequency analysis is shown below Table 4.

#### 4.2 Validation of Measurement Model

For the reliability and validity analysis of measured values, the measurement model has been verified. Reliability and validity of measuring tools are evaluated by the values of factor loadings, AVE (average variance extracted) and CR (composite reliability)[23]. In general, if factor loading and AVE values are higher than 0.5 and CR value is higher than 0.7, the internal consistency and convergence validity can be ensured[25]. In addition, to ensure the discriminant validity, factor loadings of each variable’s measurement item should be higher than that of other variable’s one than the correlation coefficient between itself and other variables[23, 25].

Measurement model used in this study met all the above criteria, the reliability and validity have been verified as in Table 5 and 6.

#### 4.3 Validation of Structural Model

In PLS analysis, the R2 values of endogenous variables are used as indicators without providing model fit indices[23,26]. The R2 value of endogenous variables in this study is 0.457. Since the value is over the general criteria (0.1)[27], research model is appropriate for the analysis. Verification results of hypotheses are as follows. Reliability, tangibles and efficiency factors have significant effects on the user satisfaction in case of the hypothesis for the relationship between determinants of service quality and user satisfaction. Responsiveness and security factors proved to be non-significant factors of the user satisfaction. Verification results of the hypothesis are summarized as Table 7.

### 5. Conclusion and Discussion

This empirical study is about how quality of Government 2.0 services affects the user satisfaction. This research was conducted through a survey to experienced users. As a result of the survey, among 4 types of Government 2.0 services, only public transport information service has minimal user samples for the analysis. In previous studies, leading indicators of user satisfaction was typically the quality of service. Thus, this study examined the validation of the existing theory in a particular subject, the Government 2.0. Also, the research is conducted to find appropriate elements for evaluating service quality of the Government 2.0.

As a result of this study, following conclusions were drawn. In order to determine the quality of



(Table 5) Factor Loadings and Cross-factor Loadings of Variables

Classification	SAT	TAN	REL	RES	EFF	SEC	$\alpha$
SAT1	0.861	0.399	0.465	0.444	0.490	0.408	0.947
SAT2	0.900	0.457	0.520	0.400	0.480	0.464	
SAT3	0.894	0.453	0.506	0.484	0.492	0.447	
SAT4	0.882	0.461	0.568	0.433	0.473	0.518	
SAT5	0.909	0.436	0.462	0.444	0.490	0.409	
SAT6	0.894	0.488	0.576	0.548	0.513	0.450	
TAN1	0.335	0.751	0.291	0.362	0.387	0.264	0.883
TAN2	0.359	0.834	0.401	0.287	0.428	0.190	
TAN3	0.545	0.938	0.525	0.471	0.445	0.352	
TAN4	0.459	0.912	0.461	0.560	0.458	0.333	
REL1	0.485	0.459	0.889	0.608	0.473	0.614	0.777
REL2	0.563	0.446	0.919	0.489	0.462	0.545	
RES1	0.548	0.524	0.606	0.898	0.549	0.597	0.912
RES2	0.390	0.430	0.543	0.878	0.569	0.667	
RES 3	0.397	0.396	0.522	0.824	0.439	0.637	
RES 4	0.423	0.408	0.423	0.843	0.517	0.440	
RES5	0.245	0.388	0.294	0.697	0.421	0.327	
RES6	0.492	0.347	0.538	0.852	0.531	0.679	
EFF1	0.482	0.398	0.429	0.464	0.841	0.493	0.885
EFF2	0.471	0.372	0.424	0.540	0.894	0.590	
EFF3	0.467	0.383	0.422	0.466	0.864	0.543	
EFF4	0.478	0.561	0.506	0.626	0.853	0.588	
SEC1	0.354	0.221	0.450	0.492	0.477	0.864	0.763
SEC2	0.316	0.035	0.387	0.481	0.364	0.721	
SEC3	0.525	0.468	0.666	0.667	0.668	0.868	

(Table 6) The CorrelationCoefficient, Reliability and Discriminant Validity of Variables

	CR	RES	SEC	REL	TAN	SAT	EFF
RES	0.932	0.834					
SEC	0.860	0.683	0.821				
REL	0.899	0.601	0.638	0.904			
TAN	0.920	0.498	0.339	0.499	0.862		
SAT	0.958	0.517	0.506	0.583	0.506	0.890	
EFF	0.921	0.607	0.641	0.516	0.497	0.550	0.863
AVE		0.696	0.673	0.817	0.743	0.792	0.745

(Table 7) The Correlation Coefficient, Reliability and Discriminant Validity of Variables

Hypothesis	Path	Path Coefficients	T-value	P-value	Result
H1	RES→AT	0.064	0.501	0.309	Rejected
H2	SEC→AT	0.073	0.687	0.247	Rejected
H3	REL→AT	0.286	3.274	0.001	Adopted
H4	TAN→AT	0.198	2.348	0.010	Adopted
H5	EFF→AT	0.219	1.712	0.045	Adopted

service, it is shown that tangibles, reliability, and efficiency factors have significant and positive effects on user satisfaction. In terms of tangibles, in order to satisfy users, the configuration of screen needs to be visually attractive, well organized, and in harmony with contents. Utilizing latest technologies of smartphones such as cloud computing, context awareness appears to be an important factor. In terms of reliability, being equipped with the ability to provide accurate, reliable and non-error service to users is also important. Finally, in terms of efficiency, a simple service configuration, quick and easy to understand, faster page loads are considered as important factors. It is important for users to organize service efficiently in order to lessen efforts to use the service.

As the results of this study, the following theoretical and policy implications would be expected. First, from the theoretical aspects, the significance of this research suggests an important theoretical model and it is about a causal relationship between Government 2.0 service quality and satisfaction. The importance of opening public information, active use and providing basic system has been mentioned as necessary conditions to activate Government 2.0 services. However, from the user perspective, the theoretical model for service activation has almost not been discussed practically. Thus, this empirical study has significant implications in that a theoretical foundation on the

measuring quality of Government 2.0 service is suggested.

Second, in terms of the policy and practice, the significance of this study is as follows. First, to increase user satisfaction, measurement items of this study could be utilized to assess currently available Government 2.0 services. Also, in terms of improvement and maintenance of Government 2.0 services, the measurement model of this study could be utilized as a useful analytical framework for understanding deficiencies and merits in the government 2.0 services. This can help service providers focus on what factors are important when they design and manage services. Therefore, analyzing the quality of the government 2.0 service has empirically great significance for the reason that there are little or no practical analysis and evaluation of the quality of Government 2.0 service.

This research has several limitations. First, Government 2.0 services are still at an early stage, so wide range of services has not been developed and they have a few users. Because of these circumstances, only public transportation service was used for the analysis in this study. In other words, based on the characteristics of Government 2.0, in-depth research which is categorized by types, providers, means of use, and the magnitude of users for the service needs to be conducted. Second, due to lack of existing academic research about the service quality of Government 2.0, theoretical

consideration on key dimensions of specific service quality was insufficient. Therefore, comparative study needs to be conducted for the future research by supplementing these limitations.

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