Cultural Influence on Koreans' Continuous Use Behavior: A Case of the South Korean Government Portal Website

*Yuanyuan Guo**

Although South Korea's e-government development is in a leading position worldwide, its government portal websites are not very popular with the public. Koreans are reluctant to use government portal websites continuously. One possible reason is that culture influences citizens' continuous use behavior. For the first time, this paper introduces the national culture model and nudge theory into the research of the citizens' continuous use of government portal websites. Based on the national cultural model, this study established a model of influencing factors on the citizens' continuous use of government portal websites. Through hierarchical regression analysis, this paper finds that the citizens' continuous use of South Korean government portal websites is influenced by three cultural dimensions: power distance, femininity, and long-term orientation. In view of these results, this paper discusses these Korean cultures that influence citizens' continuous use behavior of government portal websites. Furthermore, combined with the nudge theory, this paper puts forward some countermeasures for the Korean government to improve the citizens' continuous use of government portal websites.

Key Words: Korean Research, Government Portal Website, National Cultural Model, Nudge Theory

I. Introduction

As a leading country in e-government development, South Korea has vigorously promoted the national IT economy since the 1980s. It takes the use of modern information and communication technology to develop productivity as an essential strategy for national development, aiming at using information and communication technology to promote

* Ph.D. Candidate, Beijing Normal University; E-mail: guoasuna@gmail.com

KOREA OBSERVER, Vol. 53, No. 4, Winter 2022, pp.629-654

https://doi.org/10.29152/KOIKS.2022.53.4.629

national economic development and enhance national competitiveness. Despite South Korea's massive investment in e-government resources, e-government is still not universal among citizens. At first, citizens' unwillingness to continuously use government portal websites makes the government's investment income fail to achieve the desired goal. Furthermore, some local governments have built many websites with solid online functions regardless of local environmental conditions and the needs of citizens, but few citizens have used them. In many places, e-government platforms have even been seriously idle. The phenomenon of repeated construction and redundant platform appeared in e-government construction (Wang & Jiang, 2007).

Currently, most scholars in e-government research, mainly focus on the administrative organization's internal factors (information quality, service quality, system quality, availability, accessibility, ease of use and other internal factors). However, e-government research cannot be separated from its external environmental factors. These external environmental factors include a country or region's existing economic, political, cultural, and other conditions. There is evidence that even in countries with similar economic conditions, the utilization rate of e-government in governments varies greatly (United Nations, 2020), and the citizens' continuous use level of e-government is also different. One possible explanation is that people's understanding of technology may vary according to national culture (Erumban & de Jong, 2006). Different values and attitudes affect how people interact and use the environment (Hofstede, 2001). Therefore, in a specific society, the cultural values of these countries may manipulate citizens' perceptions in some way (Hofstede, 2001), thereby affecting citizens' continuous use behaviour. In other words, different national cultures let people have different attitudes toward e-government platforms, making the difference between national cultures an essential issue in the citizens' continuous use of government portal websites.

This paper attempts to explore the main factors that determine the citizen's continuous use of South Korean government portal websites by using Hofstede's national cultural model and clarify how these factors affect the continuous use of government portal websites combined with nudge theory so as to improve the overall citizens' continuous use level of government portal websites in South Korea and put forward valuable suggestions for future e-government work. The key issues to be solved in this paper are as follows: What are the main cultural factors affecting the citizens' continuous use of government portal websites in South Korea? How do these cultural factors affect the citizens' continuous use of government portal websites? Based on the culture dimension, how do governments use nudge theory to improve citizens' continuous use of government portal websites?

II. Literature Review and Research Framework

The continuous use of government portal websites means that citizens give priority to a specific website when they need to use a specific service, use it continuously and let this website become their part of life. Therefore, the first part of the literature review of this paper introduces the related research on Korean people's continuous use of government portal websites.

A. The Determinants of the Citizens' Continuous Use of Government Portal Website in South Korea

The continuous use of government portal websites is a decision and behavior made by citizens, and it includes two parts: willingness to use continuously and behavior to use continuously (Guo & Sun, 2020). Kim et al. (2020) analyzed the motivation for people's continuous use of the Cheongwadae (the presidential office of South Korea) National Petition Service. They found that symbolism, usefulness, satisfaction, and trust positively impact continuous use intention. They pointed out that in order to increase users' actual participation in the online platform of deliberative democracy, symbolism, usefulness, satisfaction, and trust factors should be deeply considered rather than technical aspects. Lee et al. (2007) tried to use the Korean Standard Service Quality Index to measure the service quality of a local government. They analyzed the relationship between service quality, user satisfaction, and job satisfaction in the local e-government environment. They found that accessibility, reliability, and central services affect the service quality of local e-government. In addition, the service quality of local e-government affects user satisfaction, and user satisfaction affects the job satisfaction of user groups. Satisfaction positively affects users' willingness and behavior of continuous use. Kim (2022), based on the quality-value-loyalty chain and information system persistence model, aims to determine how "intelligent work support service" leads to employees' willingness to work intelligently. He analyzed and verified the components of intelligent work support service quality and the dimensions of perceived value by partial least squares method and then tested the conceptual model by structural equation model. His results verify that the service quality of intelligent work support consists of eight attributes and divide the perceived value of intelligent work into three dimensions, which further reveals that the service quality affects the sustained willingness of intelligent work through perceived value and satisfaction. His research aims to explore the relationship between service quality, perceived value, and satisfaction, conceptualize and measure them clearly in the context

of intelligent work, and finally understand their influence on the intention to continue intelligent work.

Moon (2011) analyzes the quality and application of government e-services by decomposing the quality evaluation dimension into several factors and evaluating the influencing factors of citizens' continuous use of e-government services. He found that responsiveness, efficiency, reliability, and security significantly impact the satisfaction of e-services, and security is an essential factor affecting the continuous use of e-government. He concluded that security significantly influences the overall satisfaction of e-services, and security is also an essential factor that should be considered for future e-service applications. In other words, today's citizens are more eager to use secure e-services continuously. Therefore, enhancing the security of services to improve the overall e-services is a prerequisite for providing more developed e-government services. Kim et al. (2021) pointed out that perceived enjoyment and perceived usefulness have a positive impact on perceived value, while perceived inconvenience has a negative impact on perceived value. Perceived value positively impacts citizens' willingness to use it continuously. In addition, they found that citizens hate the risks brought by technical performance, which will affect citizens' continuous use. Guo (2022) finds that system quality, platform promotion effect, and user preference positively influence user activity of the government-provided app. User preference is critical in maintaining active users and letting the user continuously use government-provided apps.

It can be seen from the above literature that scholars are mostly concerned about the influence of internal factors of administrative organizations on citizens' continuous use of government portal websites. These internal factors include two parts. The first part is the government portal websites' objective factors such as system quality (Guo, 2022), service quality (Lee et al., 2011; Kim, 2022; Li et al., 2007), information quality, website responsiveness (Lim & Lee, 2021), transparency, data security (Moon, 2011; Guo, 2021). The second part is the citizens' psychological process of making decisions such as expectation, perception (Kim et al., 2021) and satisfaction (Kim & Kim, 2015; Kim et al., 2020; Lee et al., 2007; Moon, 2011). However, citizens' continuous use of government portal websites is influenced not only by the internal factors of administrative organizations but also by the external factors of administrative organizations. Among the external factors of administrative organization, the most influential factor on government portal websites is national culture. Citizens in different cultures have different attitudes towards government portal websites, which makes them have different levels of continuous use of government portal websites. The nudge theory in behavioral public policy (BPP) can use the characteristics of culture to nudge citizens' behavior so that citizens can make correct decisions and use

government portal websites continuously.

B. Nudge Theory and e-Government

In order to guide citizens to make correct decisions and behaviors, scholars often use the nudge theory to conduct relevant behavior research. Nudge theory is an important theory in behavioral public policy (BPP). The mainstream view of public policy is that human assessment of information is biased because thinking shortcuts and empirical rules are often effective and lead to predictable errors (Jolls et al., 1998). Humans sacrifice their interests by violating the axiom of expected utility theory (Jolls et al., 1998). Their willpower is impacted by impulse and short-term behavior, which seriously hinders their ability to achieve the expected goals (Jolls et al., 1998). So, people always deviate from the standard economic model of rational judgment and decision-making (Tversky & Kahneman, 1974; Kahneman & Tversky, 1979). They need to be guided correctly. In particular, guidance on regulatory behavior requires understanding how individuals make decisions and what factors shape their behavior (Thaler & Sunstein, 2008).

At present, the research on applying nudge theory to e-government is rare. Most scholars promote consumers' behavior based on behavior intervention to achieve various goals. Although consumers are usually the promotion target, the government acts as a "promotion agent" in government supervision to implement a nudge strategy for enterprises or consumers (Tikotsky et al., 2020). Ozdemir (2020) proposed a simple digital-driven process model to design digital behavioral interventions. He pointed out that nudges can guide people's behavior in the digital environment by using the user interface and design elements. In today's society, many people's decisions are made in the network environment. The strategy of digital nudge can significantly help all parties (communicators, decision-makers, and designers) to guide users to make the best choice for themselves and their social wealth. Digital nudge can be used in many digital environments, such as social media, e-government, location services, and many other digital interfaces in the decision-making process.

Schneider et al. (2020) studied that electronic identity (eID) supports user identity authorization in the online environment. They pointed out that although eID plays a central role in the global government's plan to digitize citizen transactions, the adoption rate of eID by citizens is still low. Using digital nudge theory, they studied how to increase the adoption of eID by changing the decision-making environment of users' choice of eID. They used experimental research to investigate the influence of default options (default eID and offline ID) and popular signals (social proof) on users' eID adoption behavior. Both nudging strategies have increased citizens' adoption of eID. However, the default

option is a double-edged sword because it simultaneously aggravates the concern about government privacy and weakens the influence of the default option on eID adoption. They believe that these concerns can be alleviated by adding social proof clues. John and Blume (2017) also pointed out that when citizens rely on offline public services, nudging may be the best way to encourage them to change channels (from offline public services to online public services). The role of nudge will become important when there is still a digital divide between those who often use e-government services and those who do not. They used social clues in behavioral science to conduct randomized controlled experiments. The experiment examined the use of online services that local councils encouraged for 5,817 disabled people. They found that simplification and collective welfare treatment increased citizens' use of online e-government services by 6%, while messengers did not affect citizens' use of online e-government services. Experiments show that public authorities can use nudge to encourage citizens to use online services, regardless of age and poverty level. These articles show the influence of the nudge strategy on e-government, and nudge will affect citizens' behavior to use e-government services continuously. Nudge is just a strategy. Culture is an essential factor that affects citizens' continuous use of e-government services.

C. Culture and e-Government

Today, the research on citizens' continuous use of e-government seems to be maturing because scholars have developed several theoretical models to explain the citizens' continuous use of e-government services. It includes theoretical models such as the technology acceptance model TAM, planned behavior theory TPB, etc. However, these models do not meet the expectations of researchers interested in the continuous use of government portal websites because they only explain a small part of the user differences. For example, Taylor and Todd (1995) reported that the technology acceptance model TAM could only explain 34% of the user differences, while the planned behavior theory explains 36%. This result makes the difference between 64% and 66% unable to be explained. One of the shortcomings of these models is that most of the variables are the internal variables of the administrative organization. Typical variables used in such studies are perceived usefulness and perceived ease of use. However, any organizational phenomenon is not only affected by internal variables but also by external variables. Therefore, the research of e-government needs to include the external variables of the administrative organization that may have the same or stronger influence on the research of e-government. One possible variable is national culture.

Researchers have begun to recognize the above arguments in information systems research. Therefore, some researchers tried to combine information systems with national culture (Bagchi et al., 2004). For example, Veiga et al. (2001) stated that when the national culture shared by a group of people affects their behavior in various ways, the use of information systems is related to the national culture, which will impact the implementation of technological change. The emergence of this phenomenon combines the national culture with research on the use of information systems. Some scholars have found (Wallace et al., 2013) that individual culture and perceived societal values affect the decision to adopt information and communication technology. Information system researchers (Almutairi, 2008) have identified cultural values as one of the influencing factors of technology use and concluded that national culture affects and shapes people's common values. Since the e-government system is not only a policy tool but also an information system, different national cultures and values may also determine citizens' continuous use of government portal websites.

This study investigates the influence of national cultural variables on Korean citizens' continuous use of government portal websites and sorts out which national cultural variables affect Korean citizens' continuous use of government portal websites.

D. Hofstede's National Culture Model and Research Framework

This paper uses Hofstede's national cultural model as the basic model. The Hofstede national cultural model is a concept adopted by Geert Hofstede (1980). This model currently includes six dimensions: power distance, uncertainty avoidance and acceptance, collectivism and individualism, masculinity and femininity, long-term oriented and short-term orientation, indulgence and constraint. Hofstede's research shows that South Korea is a collectivist country with a high power distance, and people are in a culture of long-term orientation, constraint, femininity, and uncertainty avoidance. Therefore, this study is based on these six cultural dimensions.

(1) Power Distance

Power distance refers to citizens' views on power distribution in a particular culture. The high power distance culture shows that in enterprises, employees can accept the dictatorship of leaders. In life, citizens can accept that power is concentrated on a few elites. Citizens take the inequality of power distribution in society for granted. Citizens think that they should obey the decisions of their superiors, and they succumb to the authority of their superiors. If their superiors ask them to do something they hate, they

will also do it even if these things are against their will. On the contrary, in a society with low power distance, citizens in this culture think everyone should have equal rights, whether in the organization or the life. They regard their superior leaders as equal people and oppose unfair power distribution. A society with high power distance is more likely to resist the implementation and application of information technology, thereby impeding the modernization efforts of Governments. Zhang et al. (2009) found that China's e-government system failed primarily because of the extended decision-making process rooted in the power distance characteristics of the Far East culture. Kovačić (2009) pointed out that in countries with excellent power distance, people accept a hierarchical order in which everyone has a position that does not need further proof. Countries with small power distance allow their citizens upward social mobility and participation in the decision-making process. One of the conditions for citizen participation is implementing various communication technologies that support and help such participation. Therefore, a country with greater power distance will negatively affect implementing and using ICT. According to Hofstede's research, South Korea is a high power distance society. According to the above ideas, this paper puts forward the following assumption:

H1: The power distance variable has a negative impact on the citizens' continuous use of South Korean government portal websites.

(2) Uncertainty Avoidance

Uncertainty refers to people's attitude towards vague and uncertain things. Citizens in the uncertainty-avoiding culture hate the occurrence of uncertain things. They like things under control and hate taking risks. Because new technology may bring risks, people in uncertainty-avoiding cultures may resist adopting new technology. Citizens in the culture of uncertainty acceptance are adventurous, like to explore, and think that things with uncertainty are more attractive. People in an uncertainty avoidance culture are more likely to avoid learning new technologies because it involves uncertainty and ambiguity (Veiga et al., 2001). Danowitz et al. (1995) found that the high uncertainty avoidance culture in Middle East countries was an essential factor in the low adoption rate of information technology. Similarly, the government in a culture of highly avoiding uncertainty may not be eager to recognize high-risk e-government initiatives. Kovačić (2009) believes that members of society with substantial uncertainty avoidance ability tend to avoid or reduce risks caused by the unknown. It can be expected that countries that strive to avoid uncertainty will be slow in adopting and using new ICTs, while countries, in contrast, will be in a leading position in implementing new ICTs and willing to take the risk

of failure. The government of a country with a strong uncertainty avoidance culture will hold a negative attitude towards improving the preparation level of e-government. South Korea is an uncertainty avoidance country. This paper also puts forward the following hypothesis according to the above content:

H2: The uncertainty avoidance variable has a negative impact on the citizens' continuous use of South Korean government portal websites.

(3) Collectivism

Individualism and collectivism mainly refer to citizens' views on the collective. In the culture of individualism, people have strong independence and think the personal initiative is more critical than social relations. In the culture of collectivism, people like to "hold a group" and think that only in the "group" can they feel more secure. Collectivism is a kind of psychological state whether which people habitually live in groups. In a collectivist society, members of small groups tend to exclude non-group members, and group members will take care of each other and maintain a high degree of loyalty. In order to keep in line with the others in the group, people will act like others, driven by a herd mentality. Kovačić (2009) proposed that in countries with high collectivism, people believe that groups are the primary source of their identity. An individualistic culture pays more attention to individual performance. Time management is essential, and any technology that can help individuals work more effectively is highly valued and quickly accepted. It can therefore be said that a country with a strong culture of individualism will take a positive attitude towards the implementation and use of ICT. Its government will take a positive attitude towards improving the e-government. Governments in individualistic societies are more likely to use information technology to provide people with e-services and less preparedness for e-government in countries with higher group collectivism values (Khalil, 2011). South Korea is a collectivist country. According to the above literature, the following hypothesis can be derived:

H3: The collectivism variable has a negative impact on the citizens' continuous use of South Korean government portal websites.

(4) Femininity

Masculine society and feminine society are two non-antagonistic social states. People in masculine society attach importance to work efficiency, while those in feminine society attach importance to fairness and quality of life. In a feminine society, people pay great

attention to the quality and fairness of life and put work performance second place. Both men and women are in the dominant position. They should be careful, decisive, responsible, and gentle, and pay attention to life facts and quality of life. This type of society pays attention to harmony, and men and women should share family and work affairs, which is typical of a welfare society. People try to find a balance between work and family and will not ignore family because of work. It is a society where life quality concerns are more significant than efficiency concerns. Hoehle et al. (2015) pointed out that since most mobile applications are tailored for global consumption, developing applications that meet different cultural backgrounds and individual needs is a considerable challenge. To solve this problem, they developed a model to examine the impact of usability of mobile social media applications on the intention of continuous use using the recently developed conceptualization of usability of mobile applications and related tools. Drawing lessons from Hofstede's five cultural values, they incorporated cultural values such as masculinity/femininity, individualism/collectivism, power distance, uncertainty avoidance, and long-term positioning into the theoretical model as moderating variables. To test this model, they collected data from 1,844 consumers from four countries: the United States, Germany, China, and India. They studied consumers' use of mobile social media applications on smartphones. They found that national culture moderates the impact of mobile social media availability on the intention of continuous use. Cyr et al. (2017) believe that femininity will affect people's cognition of websites. In order to explore whether biological gender and psychological gender affect users' perception, they revised the technology acceptance model (TAM). Two groups of respondents were selected from the countries with the highest masculinity and femininity scores to expand the sample differences of participants. They found that psychological gender can predict trust and technical acceptance more than physical gender. In addition, their research confirms that the femininity originally proposed by Hofstede is scientific and reasonable. South Korea is a feminine society. According to the above logical thinking, this study also puts forward the following assumption:

H4: The femininity variable has a positive impact on the citizens' continuous use of South Korean government portal websites.

(5) Long-term Orientation

Long-term orientation means citizens' attitude towards long-term life. Long-term oriented society pays attention to the future and long-term benefits, characterized by "perseverance" and humility. This type of society emphasizes thrift, and people are willing to make long-term investments for future benefits and accept slow results. A society

with stronger long-term oriented practice tends to show better economic and social health, scientific progress, democratic political ideals, stronger gender status, and higher domestic savings than those with lower long-term oriented practice (House et al., 2004). Khalil and Seleim (2009) found that social information dissemination ability was negatively correlated with future-oriented values and positively correlated with future-oriented practices. Subsequently, they found in 2010 that social knowledge transfer capability was negatively correlated with future-oriented values and positively correlated with future-oriented practices. Politicians in high long-term oriented societies will realize the strong desire to modernize government and provide e-services to citizens. Khalil (2011) pointed out that in countries with higher short-term orientation, e-government is less prepared. In countries with a high level of long-term oriented practice, the preparation for e-government is high. South Korea is a long-term orientation country. According to the above research ideas, this paper also puts forward the following assumption:

H5: The long-term orientation variable has a positive impact on the citizens' continuous use of South Korean government portal websites.

(6) Constraint

Indulgence society and constraint society are two different social forms. People in an indulgent society tend to be happier and healthier and have an optimistic attitude toward life, which is a hedonistic society. People in a constrained society are relatively unhappy and unhealthy and have a pessimistic attitude towards life. They think that what happens to them is not caused by their factors but by other objective environmental factors, and it is a typical work-oriented society. There are more introverts in this society. People rarely participate in sports, sports for them is an ornamental activity. A constrained society has strict norms of social moral constraints, and people believe that maintaining national order is more important than having freedom of expression. The crime rate in this type of society is low, and the police are relatively more. In a constrained society, people have fewer friends and do not like face-to-face communication. They prefer online communication, so doing things online has become people's focus in a constrained society. According to Hofstede's study, South Korea is a constrained society. Currently, there is no literature on the relationship between constrained society and e-government. But according to the above research ideas, this paper puts forward the following assumption:

H6: The constraint variable has a positive impact on the citizens' continuous use of South Korean government portal websites.

According to the above description and assumptions, the independent variables affecting the citizens' continuous use (dependent variable) are power distance, uncertainty avoidance, collectivism, femininity, long-term orientation, and constraint. In addition, this paper selects gender, age and education as control variables.

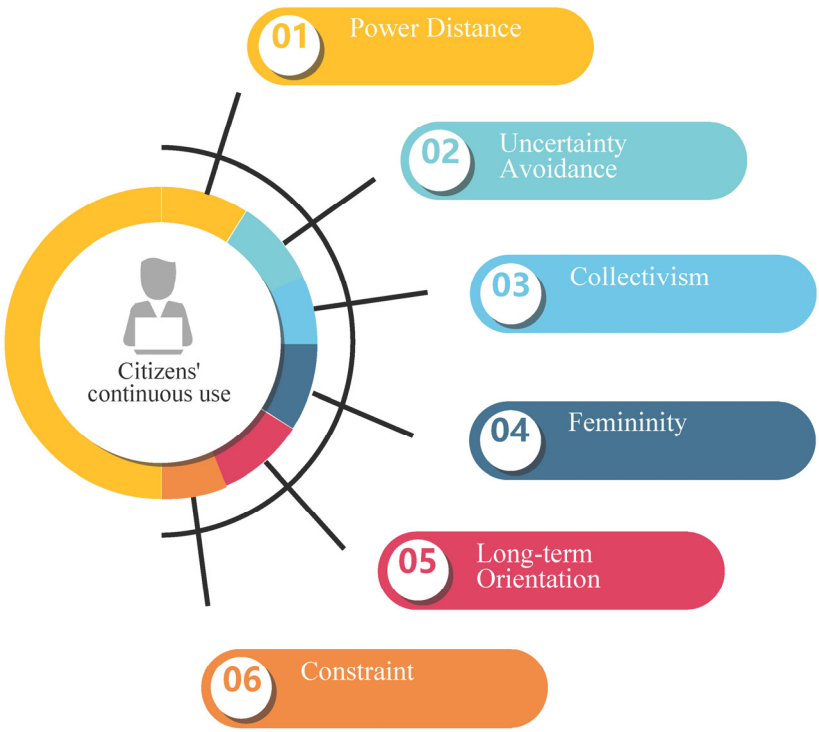

Figure 1. *The basic model of citizens' continuous use of South Korean government portal websites based on Hofstede Cultural Model*

III. Method

A. Data Collection

This paper collects data based on a multi-stage stratified sampling method. Data collection includes online collection and offline distribution. The collection began in January 2021. As of May 2021, a total of 1,024 questionnaires were distributed and 963 questionnaires were collected, with a recovery rate of 94%. After collecting the

questionnaires, we deleted some unqualified questionnaires through strict examination and the remaining 740 qualified questionnaires.

B. Basic Information of the Sample

In this research questionnaire, a total of three control variables (gender, age, education). Gender variables include male and female. Age variables were divided into four groups: under 18 years old, 19 to 35 years old, 36 to 59 years old, and over 60 years old. In order to measure the impact of educational background on the citizens' continuous use of government portal websites, this study divides it into four categories according to educational background: under bachelor, bachelor, master, and doctor (Table 1).

Table 1. *Basic information of the sample*

		Frequency	Percentage	Effective percentage	Cumulative percent
Gender	Male	342	46.2	46.2	46.2
	Female	398	53.8	53.8	100.0
	Total	740	100.0	100.0	
Age	Under 18	109	14.7	14.7	14.7
	19-35	375	50.7	50.7	65.4
	36-59	170	23.0	23.0	88.4
	Above 60	86	11.6	11.6	100.0
	Total	740	100.0	100.0	
Education Background	Under Bachelor	112	15.1	15.1	15.1
	Bachelor	318	43.0	43.0	58.1
	Master	173	23.4	23.4	81.5
	Doctor	137	18.5	18.5	100.0
	Total	740	100.0	100.0	

As can be seen from Table 1, among the respondents in this questionnaire, 342 were males, accounting for 46.2%, and 398 were females, accounting for 53.8%. The age distribution is mainly between 19 and 35 years old, accounting for 50.7% of the total. Education is mainly concentrated in bachelor, a total of 318 people, accounting for 43.0%.

IV. Result and Analysis

A. Reliability and Validity Test

Before large-scale data collection, we did a pre-survey and collected 150 samples to check the reliability and validity of the questionnaire. This paper uses SPSS 23.0 to test its reliability and validity.

Table 2. *Reliability*

	Cronbach's alpha
Power distance	0.769
Uncertainty avoidance	0.871
Collectivism	0.884
Femininity	0.849
Long-term orientation	0.914
Constraint	0.905
Citizens' continuous use	0.825
Overall	0.853

The reliability (Table 2) is 0.769, 0.871, 0.884, 0.849, 0.914, 0.905, 0.825 from power distance variable to citizens' continuous use variable. The overall reliability of the questionnaire is 0.853. And the validity is 0.718 (Table 3).

Table 3. *KMO and Bartlett test*

KMO value		.718
Bartlett sphericity test	Approximate chi-square	3990.729
	Degree of freedom	741
	Significance	.000

B. Pearson Correlation Analysis

This paper used SPSSAU (Online SPSS analysis website) to make the Pearson correlation analysis, collinearity diagnostic, and hierarchical regression analysis. As can be seen from Table 4, correlation analysis is used to study the correlation between continuous use and six independent variables: power distance, uncertainty avoidance, collectivism, femininity, long-term orientation, and constraint, and the Pearson correlation coefficient is used to indicate the strength of the correlation.

Table 4. *Pearson correlation coefficient*

		Citizens' continuous use
Power Distance	correlation coefficient	0.213**
	p -value	0.000
Uncertainty Avoidance	correlation coefficient	0.037
	p-value	0.309
Collectivism	correlation coefficient	0.051
	p-value	0.164
Femininity	correlation coefficient	0.571**
	p-value	0.000
Long-term Orientation	correlation coefficient	0.322**
	p-value	0.000
Constraint	correlation coefficient	0.055
	p-value	0.135

* p<0.05 ** p<0.01

The above analysis results show that the correlation coefficient between continuous use and power distance is 0.213, and it shows a significant level of 0.00, which shows a significant positive correlation between continuous use and power distance. Similarly, the data results show that femininity and long-term orientation have a significant positive correlation with continuous use. However, uncertainty avoidance, collectivism, and constraint have no correlation with continuous use, so these three variables will not include in the hierarchical linear regression analysis (Figure 2).

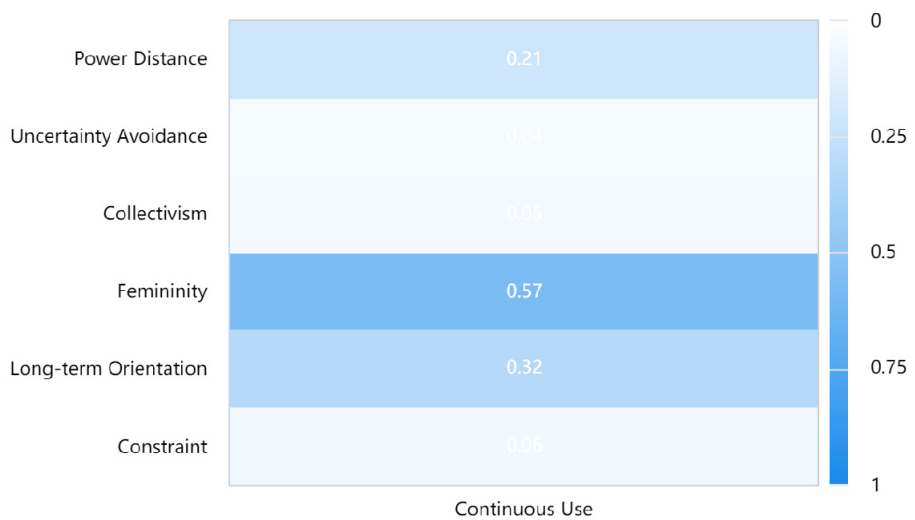

Figure 2. *Pearson correlation visualization diagram*

C. Hierarchical Regression Analysis

Before hierarchical regression analysis, this paper first diagnosed whether the data were collinear or not. If the VIF value is less than 5, it means there is no collinearity (Table 5).

Table 5. *Collinearity diagnostic table (VIF value)*

	Stratification 1	Stratification 2
sex	1.002	1.032
age	1.015	1.018
education	1.013	1.016
Power Distance	-	1.064
Femininity	-	1.164
Long-term Orientation	-	1.151

As seen in Table 6, this hierarchical regression analysis involves two models. The independent variables in model 1 are sex, age, and education. Model 2 adds power distance, femininity, and long-term orientation based on model 1, and the model's dependent variable is continuous use. Hierarchical regression analysis results are as follows (Table 6):

Table 6. *Hierarchical regression analysis results*

	Stratification 1					Stratification 2				
	B	Standard error	t	p	β	B	Standard error	t	p	β
Constant	2.675**	0.275	9.737	0.000	-	-0.553	0.334	-1.659	0.097	-
sex	0.328**	0.120	2.734	0.006	0.100	0.159	0.098	1.617	0.106	0.049
age	0.122	0.109	1.119	0.264	0.041	0.111	0.088	1.265	0.206	0.038
education	0.075	0.054	1.409	0.159	0.052	0.069	0.043	1.595	0.111	0.048
Power Distance						0.163**	0.058	2.818	0.005	0.086
Femininity						0.599**	0.038	15.703	0.000	0.501
Long-term Orientation						0.249**	0.054	4.604	0.000	0.146
R^2	0.014					0.360				
R^2 adjustment	0.010					0.355				
F value	F (3,736)=3.599,p=0.013					F (6,733)=68.709,p=0.000				
$\triangle R^2$	0.014					0.346				
$\triangle$F value	F (3,736)=3.599,p=0.013					F (3,733)=131.899,p=0.000				

Dependent variable: continuous use
* p<0.05 ** p<0.01

Sex, age, and education are used as independent variables, and continuous use is used as the dependent variable for linear regression analysis in model 1. As can be seen from Table 6, the R^2 value of model 1 is 0.014. It means that sex, age, and education explain the 1.4% change in citizens' continuous use. The model passed the F test ($F= 3.599$, $p<0.05$), meaning that at least one controlled variable of sex, age, and education will impact the continuous use.

In model 2, after adding power distance, femininity, and long-term orientation to model 1, the change in the F value is significant ($p<0.05$), which means that adding power distance, femininity, and long-term orientation can explain the model. In addition, the R^2 value increases from 0.014 to 0.360, which means that power distance, femininity, and long-term orientation can explain continuous use by 34.6%.

These results show why Koreans use government portal websites in the cultural dimension. In model 2, the regression coefficient value of power distance is 0.163, which is significant ($t=2.818$, $p=0.005<0.01$), meaning that power distance has a significant positive influence on continuous use. This result is inconsistent with H1 (The power distance variable has a negative impact on the citizens' continuous use of South Korean government portal websites). Since the e-government platform also belongs to information communication technology (ICT), this article makes an assumption consistent with the views of scholars (Zhang et al., 2009; Kovačić, 2009; Khalil, 2011). However, the data result is contrary to this assumption. The result shows that power distance positively impacts citizens' continuous use. One possible explanation is that, compared with information systems, e-government platforms have more policy tool characteristics. The policy tool has the characteristics of safety, reliability, convenience, and service provided by government portal websites that have won the public's recognition. The authority of the superior did not cause the public to contradict the e-government service but also promoted the citizen's continuous use.

The regression coefficient of femininity is 0.599, which is significant ($t=15.703$, $p= 0.000<0.01$), meaning that femininity has a significant positive influence on continuous use. A feminine society is characterized by people's concern for fairness and quality of life. Theoretically, government portal websites can provide people with fair e-government services. Influenced by feminine culture, Koreans will continue to use government portal websites. However, fairness and quality of life are relative concepts. Some people think that government portal websites will provide fair e-government services and help improve people's quality of life, so they will continue to use them. However, some people do not think so. They may make an unreasonable choice in an unknown direction of a decision. Decision-making direction determines citizens' behavior, mainly including status quo bias and negative

deviation. Status quo bias refers to people who like things to remain unchanged. They do not want to change this situation. Since South Korea is a feminine society, they believe that not changing the status quo does not affect their quality of life. Those people (accustomed to receiving traditional government services) are accustomed to going directly to the government hall. Although various provinces and cities are vigorously promoting e-government, calling on citizens to use government portal websites. However, people accustomed to receiving traditional government services find it difficult to make their changes. If these citizens are forced to change their existing cognition and let them access e-government services online, they will feel uncomfortable, resulting in resistance. In addition, the negative deviation also makes people have a wrong understanding of the government portal website. For example, if a user finds that the e-government service provided by the government portal website can't meet his needs, or he can't find the service he wants to use, it will make him have a negative impression of the government portal website. He may feel that the government portal website will not improve his quality of life and never use it again.

The regression coefficient of long-term orientation is 0.249, which is significant ($t= 4.604$, $p=0.000<0.01$), which means that long-term orientation has a significant positive influence on continuous use. Whether or not the government portal website conforms to people's long-term orientation requires Koreans to make subjective judgments. Some Koreans think that government portal websites can adapt to their long-term orientation culture, so they will continue to use government portal websites. However, people may not continuously use government portal websites since they lack decision-making information. Information affects people's choices and may cause them not to see the long-term benefit. People may make irrational decisions because of a lack of information. Due to the lack of correct information, people often think that government portal websites cannot bring them future benefits. If everyone is rational, then they should understand that using government portal websites is more efficient and faster than doing offline work. However, not everyone is rational. They are often disturbed by external factors and make short-sighted choices. The lack of decision-making information is manifested in confirmatory bias. Besides, the single decision option will affect Korean's thinking too. Although in terms of long-term oriented, the rational situation is that people should continuous use government portal websites, which benefits future development. Because of the single choice option—calculation deviation, they believe that using a government portal website for future development is not beneficial. There is a specific calculation bias when people decide whether to use the government portal website. Groups using the government portal website include older groups, youth groups, etc. Before using e-government, the

elderly usually thought the government portal website was 'high-tech.' They think high-tech products are often complex and challenging to operate. Although young people are accustomed to using high-tech products such as mobile phones, they also believe using government portal websites is cumbersome. Korean people have limited patience and often want to deal with affairs faster. The cumbersome process of using the government portal website often makes them uncomfortable. They believe that the revenue of using the government portal website will be less than their cost.

Besides, people are challenged to remove inert. When people use government portal websites, they often need to suffer complex electronic procedures (registration, application, authentication information, payment, etc.). These programs make them feel very troubled. As a result, they intuitively refused to use the government portal website. That leads to the critical reason, people's confusion about decision-making structures. The decision-making structure is crucial. Decision-making structure includes people's way of thinking and psychological process. Mainly for their inertia and loss aversion. Inertia is a common problem. Human behavior is often changed by inertia. People's lazy nature makes them like simple, effortless options. In real life, cognitive systems usually follow the "stingy principle," compared with analytical thinking, which requires more cognitive effort. Cognitive systems tend to use intuitive thinking that requires less cognitive effort to judge and make decisions on real problems. Besides, people are loss aversion. This is an intuitive behavior. People may prefer to avoid punishment rather than get rewards. When using a government portal website, transactions are sometimes involved. People accustomed to traditional government services do not like online trading because it gives them unpredictable risks, which can cause them unnecessary losses. They are afraid to bear costs and do not think doing small things they cannot do is meaningful. They do not fully trust government portal websites or network environments. Off-line face-to-face transactions make them feel secure. Although they know that online work is suitable for their life, they are inclined to choose traditional office services because of fear of loss and inertia.

In summary, the three cultural dimensions of power distance, femininity, and long-term orientation affect Korean's continuous use behavior.

V. Discussion

How should the Korean government provide e-government services that conform to the culture, so that citizens can make correct behavior decisions and use government portal websites continuously?

Firstly, the government can link the power distance culture with the nudging strategy of the example effect. In a society with high power distance, citizens give unique cognition and evaluation to specific social roles, forming trust and commitment. Say further, citizens have the psychology of "fearing people with powerful power" and "envying people with powerful power," and they are obedient to the leading authority. The leaders' (actual or spiritual leader) social influence in the high power distance culture can guide citizens to use government portal websites continuously. If the leader can use the government portal website as an example, normal people will use it too. For example, the leading and encouraging effect of well-known education experts on children's early education is better than that of government propaganda. The recommendation of well-known movie stars and singers on specific goods and services in advertisements is better than business propaganda. Doctors' suggestions on children's vaccination are more able to impress parents than government public health plans, etc. In addition, the government can invite celebrities (movie stars, writers, or network leaders) to speak for the government portal website so that their fans also become loyal to government portal websites. This will help significantly enhance citizens' continuous use behavior of government portal websites. Besides, setting examples means that if someone uses it and gains benefits, others may be willing to follow it and use it. In life, people are more concerned about their immediate interests. If people see that others have benefited from using the government portal website, they will continue using it. That is to say, the nudge strategy of the example effect works from two aspects: one is to highlight critical information to attract the attention of policy objects; second, to optimize the way of information transmission and increase the identity of policy objects to information, and inspire expected behavior. This strategy helps attract people's attention and increases the possibility of people's continuous use of government portal websites.

Secondly, the government can also link femininity culture with the nudging strategy of social proof clues. As mentioned in this article, people in feminine culture attach great importance to the quality of life and fairness in life. Theoretically, online e-government services are fairer than the traditional way of going to the government office hall. Because if citizens go to the traditional office hall, it may involve problems such as the "acquaintance effect" and "queue-cutting effect," thus affecting people's perception of fairness. Social proof clues can guide people to make the right choice---choosing to use the e-government services provided by government portal websites. For example, citizen A likes to go to the traditional government office building to deal with daily chores because he thinks online e-government services are cumbersome. However, he wastes a lot of time and energy every time. Citizen B likes online e-government services, and he feels better fairness

than handling business offline. Therefore, citizen B told citizen A what he thought and recommended that citizen A overcome psychological barriers and continue to use the government portal websites. Even though Citizen A was initially unwilling to accept Citizen B's suggestion, he found that his friends and family were using the government portal websites too. They provided him "proof" of the "benefits" of the government portal websites. Influenced by these social proof clues, he would change his mind and try to use the government portal websites continuously.

Thirdly, the government can combine the long-term oriented culture with the nudge strategy of simplifying information. Even people know that government portal websites should be used continuously for long-term development. However, due to people's inertia and the complexity of government portal websites, people are often reluctant to use government portal websites continuously. In view of this feature, this paper suggests that the government use the strategy of simplifying information. Simplifying information refers to changing the presentation of existing information and making people receive and use helpful information more effectively (Thaler & Sunstein, 2008) so that they can make the right decision. This strategy is mainly to nudge the reception of objective knowledge information. The key to policy communication is to make policy objects clear, accurately understand policy objectives and requirements, and guide policy objects to make expected choices through language. Simplified frameworks are specific strategies for 'own inertia.' Policy designers should follow the "simplified" framework to ensure that the policy's critical information or requirements are simple and easy to understand. The simplification strategy has two main innovations: simplify the content and improve the acceptance and understanding of information by policy objects; simplify procedures to reduce the friction cost of policy object selection. Simplification is mainly reflected in simplifying language, reducing the number of problems involved in communication, and prioritizing the transmission of the most critical information. Simplification of procedures helps to increase policy object response rates. Simplifying information includes simplifying application procedures, implementing pre-application, simplifying forms, and using online tools. By simplifying the content and procedures, policymakers can significantly reduce or even eliminate friction costs, strengthen the framework of communication content, and promote people to make expected choices.

Furthermore, the government can combine the long-term oriented culture with the nudge strategy of improving the public choice framework. For example, let the government portal website into people's government service selection framework, and let the traditional way of government affairs not enter people's government service selection framework. This type of nudge strategy mainly includes increasing the visibility and accessibility

of government portal website services. Moreover, increase the availability of government portal websites so that citizens can easily handle e-government services even if they are driven by inertia—humans' instinctive tendency to focus on things at hand. Suppose the Korean government places advertisements of government portal websites online and offline, so the public can see them directly. In that case, it will help improve the citizens' continuous use of government portal website. This method attempts to influence their behaviors by changing the presentation of choices in the environment. Increasing the accessibility of government portal website services means that online government portal website services are more accessible than offline traditional government services, making the e-government service simple can obey people's inertia to occupy more positions in people's choice framework and increase the probability of being selected.

Finally, the government should combine the long-term orientation with a nudge strategy of reminding citizens decision direction. Before making decisions, it is also a critical nudge strategy to help people make correct choices by implementing reminders. Reminder strategies in e-government mainly include conceptual reminders and environmental cues. The former mainly uses precise and direct ways to help people make the right choices. In contrast, the latter uses implicit and indirect ways to guide people's decision-making direction through the intermediary of the environment. Anchoring is one of the main ways to help people make the right choice clearly and directly. It places the idea of "if I use the government portal website, it will make my daily life more convenient and help reduce the cumbersome procedures for handling public services" in people's minds. This will affect their subsequent decision on the idea. This suggestion needs to start from the following aspects: On the one hand, the Korean government should start with education. For example, in the classroom, teaching content increases the relevant knowledge of e-government, cultivating citizens' awareness of e-government and information quality from childhood. Citizens' good information quality is the premise of using government portal websites. On the other hand, the essence of e-government is not technology but application, and it is for the convenience of citizens rather than the government. Therefore, the government should provide e-government services that satisfy citizens, improve the ability of government affairs, improve the level of public management, improve the government's ability to serve society, and promote citizens' continuous use of government portal websites.

VI. Conclusion

Based on the Hofstede cultural model, this paper analyzes the cultural factors influencing citizens' continuous use of government portal websites. Then, aiming at these cultural factors, this paper puts forward appropriate suggestions for the government. The government should conform to the culture and improve citizens' continuous use. In the past, all the studies were carried out from the internal factors of administrative organizations and studied the influence of service quality, system quality, and other factors on citizens' continuous use. However, even though the government has improved internal conditions such as service quality, system quality, information quality, etc., only to a certain extent has it improved the citizens' continuous use. If the external factor of culture is included in the study of the continuous use of government portal websites, the research will be more complete, and the citizens' continuous use of government portal websites will be significantly improved.

This paper has the following limitations: Firstly, the shortcoming of research content. This study only focuses on South Korea, and the generalization of the research conclusion is limited, which needs to be further demonstrated in other country situations. Secondly, even if the government can accurately grasp the law of human behavior and design effective policy instruments to intervene, the government still lacks evidence that the impact of these interventions on behavior will last for a long time. Besides, behavioral public policy affects people's behavior by changing the institutional background in which individual behavior rules play a role. However, human behavior is unstable, and different populations may have heterogeneity. Compared with the original research group (or policy subjects), a specific behavior rule may not be so common in a specific target group. Furthermore, the intensity of behavioral laws may not be as apparent as expected. In future research, researchers can prove the feasibility of this nudging suggestion through experimental research. Most of the existing research is based on questionnaire survey data, which cannot solve the subjective defects of the data. Experiments can obtain and display behavioral information that traditional questionnaires cannot and broaden civic behavior data sources. Researchers can use these micro-behavioral data from the real world to accurately increase the accuracy of intervention to target groups.

References

Almutairi, H. 2008. "Information system usage and national culture: Evidence from the public service sector." *International Journal of Society Systems Science* 1(2): 151-175.

Bagchi, K., Hart, P., and Peterson, M. 2004. "National culture and information technology product adoption." *Journal of Global Information Technology Management* 7(4): 29-46.

Cyr, D., Gefen, D., and Walczuch, R. 2017. "Exploring the relative impact of biological sex and masculinity-femininity values on information technology use." *Behaviour & Information Technology* 36(2):178-193.

Danowitz, A. K., Nassef, Y., and Goodman, S. E. 1995. "Cyberspace across the Sahara: Computing in North Africa." *Communications of the ACM* 38(12):23-28.

Guo, Y. 2021. "Data Protection Measures in E-Society: Policy Implications of British Data Protection Act to China." In 2021 5th International Conference on E-Society, E-Education and E-Technology (ICSET 2021). Association for Computing Machinery, New York,NY,USA, 17-176.

Guo, Y. 2022. "Does User Preference Matter? A Comparative Study on Influencing Factors of User Activity Between Government-Provided and Business-Provided Apps." *Frontiers in Psychology* 13:914528.

Guo, Y., and Sun, Y. 2020. "What affects the User Sharing Degree of Public Transportation Apps in China? - A Comparative Study between Government App and Business App." *Korean Social Science Journal* 47(2):101-131.

Hoehle, H., Zhang, X.J., and Venkatesh, V. 2015. "An espoused cultural perspective to understand continued intention to use mobile applications: a four-country study of mobile social media application usability." *European Journal of Information Systems* 24(3):337-359.

Hofstede, G. 1980. "Culture's consequences: International differences in work-related values." Beverly Hills, California: Sage Publications.

Hofstede, G. 2001. "Culture's consequences." Thousand Oaks: Sage publications.

House, R.J., Hanges, P. J., and Javidan, M. 2004. "Culture, leadership, and organization: The GLOBE study of 62 societies." Thousand Oaks, CA: Sage Publications.

John, P., and Blume, T. 2017. "Nudges That Promote Channel Shift: A Randomized Evaluation of Messages to Encourage Citizens to Renew Benefits Online." *Policy and Internet* 9(2):168-183.

Jolls, C., Sunstein, C.R., and Thaler, R.H. 1998. "A Behavioral Approach to Law and

Economics." *Stanford Law Review* 50:1471-1550.

Kahneman, D., and Tversky, A. 1979. "Prospect Theory: An Analysis of Decision under Risk." *Econometrica* 47(2):263-292.

Khalil, O., and Seleim, A. 2009. "A cultural values interpretation for societal information dissemination capacity: An exploratory study." *Arab Journal of Administrative Sciences* 16(3):455-488.

Khalil. 2011. "e-Government readiness: Does national culture matter." *Government Information Quarterly* 28(3):388-399.

Kim, M., An, M., Jeong, Y., and Choi, I. 2021. "A Study on the Continuous Use Intention of Local Currency - Focusing on Consumers in Daejeon." *Consumer studies* 32(1): 123-144.

Kim, S., and Kim, H. 2015. "A Study on the Classification of the Quality of E-Government Service Using the Kano Model: Focusing on Civil Servants and Citizens." *Journal of Policy Analysis and Evaluation Society* 25(3):235-258.

Kim, S.S. 2022. "Quality of smart-work support service, perceived value and intention to continue smart-work: empirical evidence from Korea." *Information Technology & People* Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/ITP-08-2020-0544

Kim, T., Mo, E., and Yang, S. 2020. "A Study on the Users of the National Petition to CheongWaDae: Focused on their Motivations." *Informatization Policy* 27(1): 92-114.

Kovačić, Z.J. 2009. "National Culture and E-Government Readiness." *International Journal of Information Communication Technologies and Human Development (IJICTHD)* 1(2).

Lee, J., Kim, H.J., and Ahn, M.J. 2011. "The willingness of e-Government service adoption by business users: The role of offline service quality and trust in technology." *Government Information Quarterly* 28(2):222-230.

Lee, J., Shin, M., and Choi, H. 2007. "A Study of the Local e-Government Service Quality, User Satisfaction, and Job Satisfaction." *Journal of The Korean Data Analysis Society* 9(6):2997-3011.

Lim, D.H., and Lee, D.W. 2021. "Non-Face-to-Face Public Services and Perceptions of Public Organizations." *Sustainability* 13(21):12185.

Moon, S. 2011. "Impacts of Security on the Continuity of e-Service in Electronic Government." *Crisisonomy* 7(6):121-138.

Ozdemir, S. 2020. "Digital nudges and dark patterns: The angels and the archfiends of digital communication." *Digital Scholarship in the Humanities* 35(2):417-428.

Schneider, D., Klumpe, J., Adam, M., and Benlian, A. 2020. "Nudging users into digital

service solutions." *Electronic Markets* 30:863-881.

Taylor, S. and Todd, P. 1995. "Assessing IT usage: the role of prior experience." *MIS Quarterly* 19(4):561-571.

Thaler, R.H., and Sunstein, C.R. 2008. "Nudge: Improving Decisions About Health, Wealth, and Happiness." Yale University Press.

Tikotsky, A., Peer, E., and Feldman, Y. 2020. "Which nudges do businesses like? Managers' attitudes towards nudges directed at their business or at their customers." *Journal of Economic Behavior & Organization* 170:43-51.

Tversky, A., and Kahneman, D. 1974. "Judgment Under Uncertainty: Heuristics and Biases." *Science* 185(4157):1124-1131.

United Nations. 2020. "E-Government Survey 2020: Digital Government in the Decade of Action for Sustainable Development." United Nations:Department of Economic and Social Affairs.

Veiga, J. F., Floyd, S., and Dechant, K. 2001. "Towards modeling the effects of national culture on IT implementation and acceptance." *Journal of Information Technology* 16:145-158.

Wallace, S., Reid, A., Clinciu, D., and Kang, J.S. 2013. "Culture and the importance of usability attributes." *Information Technology & People* 26(1):77-93.

Wang, X., and Jiang, Q. 2007. "Administrative Ecology of E-government." Tsinghua University Publishing House.

Zhang, N., Guo, X., Chen, G., and Chau, P. 2009. "Impact of perceived fit on e-Government user evaluation: A study with a Korean cultural context." *Journal of Global Information Management* 17(1):49-69.

Received 29 January 2022
Received in revised form 25 June 2022
Accepted 22 July 2022