Measuring e-government service user value: The development of EGSERVAL scale

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電子政府における知覚価値の評価
―EGSERVALスケールの発展―

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Abstract

Delivering public services electronically has been expected to save more time and money for citizens and businesses. It is also believed to enhance government's transparency and interactivity by engaging various stakeholders into government's decision making activities. However, the common challenging issue governments worldwide have long been facing with is how to engage citizens and businesses into e-government initiatives. The explanation for this dilemma, however, is "broader and more diversified" than the argument that the difference in technical infrastructure is the key determinant. For many years, e-government services were built based on the supply-side's assumptions and perspectives without paying attention to the role and characteristics of the demand-side users. This implies that in order to deliver superior e-government services to citizens and businesses, the services need to be developed and evaluated based on user needs, beliefs, experiences, desires, goals, conditions, preferences, requirements, and anything else that shapes the value they perceived from digital public services. Technology acceptance theories and models may not fully explain how people perceive and evaluate e-government services due to the presence of the heterogeneity of public users and other contextual factors (e.g. location, time, service type, usage frequency). Therefore, to have a better understanding about public users, a more holistic approach should be employed. Given the approach discussed above, questions have been raised concerning the nature of perceived value in the context of e-government service, how to measure it, and what is the relationship between perceived value, service quality and intention to use. Holbrook's typology of consumer value was employed as the foundation theory to reveal different value types may raise during the interaction between user and e-government service. Contributions and limitations were then discussed.

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1. Introduction

1.1 Research background

E-service can be defined as "deeds, efforts or performances whose delivery is mediated by information technology (including the Web, information kiosks and mobile devices). Such e-service includes the service element of e-tailing, customer support and service, and service delivery" (Rowley 2010). Another term, used recently, is *digital services*, which refers to "the delivery of digital information (data or content) and transactional services (e.g., online forms, benefits applications) across a variety of platforms, devices, and delivery mechanisms (e.g., websites, mobile applications, and social media)" (Whitehouse 2014). E-government services are public services provided by government via electronic or digital methods.

The provision of e-government services is expected to save time and money for citizens and businesses. Considering e-service provision a top priority in national agendas, governments worldwide have continuously allocated sufficient resources to strengthen their online service capabilities. However, governments worldwide have long been facing a common challenge, the low rate of e-government take-up from citizens and businesses. As indicated by OECD (2009), "E-Government projects do not always deliver the full promised benefits, and users do not automatically use available e-government services". According to the most recent survey about citizens' attitude toward e-Government, published by the European Commission in 2014, nearly 50% of European citizens were categorized "Potential Drop-Out" (users who are more likely to give up on using online service) and "Non Believer" (users who never use online services) (European Commission, 2014). Additionally, though many governments have made efforts to improve service delivery through initiatives such as online portals or "one-stop shops", they only found themselves unable to meet the expectations of the public. A comparative study in Accenture (2014) concerning digital government performance across 10 countries demonstrated that, on average, less than 40% of surveyed citizens are satisfied with the quality of public services in their country. The explanation for this dilemma is "broader and more diversified" than arguments that differences in technical infrastructure are key determinants (OECD, 2009). For many years, e-government services were built based on the assumptions and perspectives of the supplier without concern for the role and characteristics of demand-side users (Holgersson & Karlsson 2014). It is believed that digital service provision will create more public values if end users are engaged in designing, developing, and producing the service. Therefore, to deliver superior e-government services to citizens and businesses, services need to be developed and evaluated based on user needs, beliefs, experiences, desires, goals, conditions, preferences, requirements, and any other factors that shape the value they perceive in digital public services.

The importance of understanding what users need and demand in online public services has drawn a great deal of attentions from research in the fields of public policy and information systems. The dominant research in these areas is accredited to studies employing the Technology Acceptance Model (TAM) (Davis 1989). The model, proposed by Davis (1989), has been become

the leading framework in predicting how users will react to a new technology through a large volume of empirical tests. Based on the Theory of Reasoned Action (Fishbein & Ajzen 1975), TAM hypothesized users use an outcome variable in a psychology process through which users make the decision to accept or reject a new information system. In this process, the model examines the bridging roles of perceived ease of use and perceived usefulness in the relationship between potential external variables, such as system characteristics or design features, with users' attitude toward use and actual system use. The TAM and its extended versions have been acknowledged for their great contributions in providing useful insights and implications for understanding individuals' attitudes and adoption behaviors concerning specific technologies.

However, the greatest weakness of the TAM lies within its popularity. Over time, the number of studies using the TAM have been increasing, but many of researches have used the modified version of the TAM rather than the original model (Turner et al. 2010). Most efforts have focused on "broadening" the original model by introducing new predictors, rather than explaining the effects of the existing variables (Bagozzi 2007). The lack of standardization, due to the variety of model specification, limits the generalization power of the research models (Holden & Karsh 2010). More critically, the TAM and other modified versions focus on the relationship between intention and behavior, placing user behavior as the final goal without consideration of other fundamental end-state objectives, such as the purpose and benefit of using a technology (Bagozzi 2007). This calls for an approach which explicitly focuses on the motivation, purpose, or perceived value behind users' behaviors within the context of e-government services.

1.2 Why user value?

There have been a number of studies concerning user value found marketing, business, and consumer behavior literature since the 1960s. Though a universally accepted definition of user value is lacking, most scholars agree on the important role of user/consumer value in product design, market analysis, sale promotion, and other fields. For instance, Ulaga & Chacour (2001) argue that delivering superior value to customers is key to creating and sustaining long-term industrial relationships. Moreover, existing literature suggests a key attribute which helps build the relationship between a product and its followers is the significant value the product provides for users (Cagan & Vogel 2002). Furthermore, consumer behavior is reliably predicted when evaluated through perceived value (Woodruff 1997). Similarly, Jurison (2000) concluded that "those applications that are perceived to offer high value from the start are adopted rapidly and those applications perceived to be low value are adopted slowly and are unlikely to gain acceptance in the long run".

1.3 The case study of Haiphong city

Haiphong is the third largest city in Vietnam and the biggest port and industrial city in northern Vietnam. The city is well known for large-scale industrial zones, as well as trade, service, tourism,

education, medical, and aquaculture centers in the northern delta area. As of December 2011, Haiphong's population was 1,907,705, of which 46.1% lived in urban area while 53.9% lived in rural area, making Haiphong the third most crowded city in Vietnam. In 2016, the city government set several major targets for socio-economic development in the period of 2016– 2020: enhancing the city's competitiveness; promoting investment to turn the city into a major economic, education, and technology center; constructing a green, civilized, and modern city; and improving citizen's quality of life.

To make these targets more realistic, the city government has prioritized the administration reform process to improve the public sectors' efficiency and better serve citizens and businesses. One potential solution identified is to develop a proper, local e-government framework which facilitates collaboration among local government agencies and promotes the provision of public services electronically.

1.4 Research objectives

Given such an approach, questions have been raised concerning the nature of user value in the context of e-government services and how it can be measured. The current study therefore aims to develop a tool, an e-government service value scale (referred to as EGSERVAL), which can be used to measure experiences with e-government services and the perspectives of citizens. Haiphong city was chosen for a case study because of its situation, also observed in many other cities in developing countries. Namely, it is a large city with an advanced level of ICT infrastructure and a significant annual budget capacity, but the delivery of e-government services has been stagnant at a premature stage for some time. The study hopes to provide insights for Haiphong city's policy makers about citizens' expectation of e-government services, improving the service designing and delivery process.

The following section reviews the complex nature of the user value concept through three main research threads in current literature and justifies the choice of Holbrook's (1999) typology as a theoretical framework. The methodology section introduces the research method and shows the relevance of Holbrook's consumer value to user value in an e-government service context. In the data analysis section, the EGSERVAL scale is developed and validated with primary data collected from online public services users in a city of Vietnam. Through data analysis, various types of values in e-government services are identified and the relationship between them and user behavior are tested. Finally, the research is concluded with a discussion of the findings, contributions, and limitations of the current study.

2. The concept of value
2.1 Value as exchange

In business and marketing, the concept of *value* is frequently paired with *perceived value*, *customer value*, or *consumer value*, where it is traditionally conceptualized through a utilitarian or value-in-

exchange perspective. Monroe (1979) helped generate this research by introducing in a pricing study the concept of perceived value as the trade-off between the sacrifices buyers perceive by paying a price and the benefits they perceive in the product, as shown in the following equation:

$$Perceived\ value = \frac{\text{perceived benefits}}{\text{perceived sacrifice}},$$

where perceived sacrifice is equal to the total cost of the purchase price, start-up costs, and post-purchase costs; and perceived benefits is equal to the combination of physical attributes, service attributes, and technical support relating to product use, as well as the purchase price and other indicators of perceived quality (Monroe 1979). Price is seen as a fundamental index of both perceived product quality and perceived sacrifice. Based on Monroe's price-quality relationship and means-end theory (Gutman, 1981), Zeithaml (1988) categorized consumers' responses, in an explanatory study, into four patterns: (1) value is a low price, (2) value is what I want in a product, (3) value is the quality I get for the price I pay, and (4) value is what I get for what I give. By examining these four expressions against proposals in literature, the author determined a definition of perceived value, namely "the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given".

2.2 Value as consequences

Other research conceives of perceived value more broadly definition, extending beyond the relationship of price-versus-quality or give-versus-get to include a range of interrelated attributes of product use. The leading approach in this conceptualization is credited to Woodruff and Gardial (1996) who adapted the means-end theory (Gutman 1981) to propose a hierarchical view of customers' values. The framework represents the way customers think about products on three levels: attributes, consequences, and desired end states, whereby lower levels are the means by which higher level ends are obtained. The level of abstraction and stability increases at higher levels in the hierarchy. The authors also believe that the perceived values of a product are subject to change over time, across use situations, and depend on specific occasion triggers. Here, perceived value is defined as "the customers' perception of what they want to have happen (i.e., the consequences) in a specific use situation, with the help of a product or service offering, in order to accomplish a desired purpose of goal" (Woodruff & Gardial, 1996).

2.3 Value as experience

The final strand of research considers perceived value as experiential, in which value perception emerges from interactions between a product and the user, either through direct use or distanced appreciation. The most comprehensive study with this conceptualization is Holbrook's (1999) typology of consumer value. According to Holbrook (1999), the nature of consumer value includes: *interactive*, which means the value entails an interaction between subject (consumer)

and some object (a product); *relativistic*, which refers to the involving preferences among objects (comparative), the variance across people (personal) and the context dependency (situational); *preferential*, which emphasizes the preference order or priority of interests; and *experience,* which argues that the value "is not embedded in the product purchased, in the brand chosen, in the object possessed, but rather in the consumption experience(s) derived therefrom" (Holbrook, 1999). The argument ultimately leads to an overall definition in which consumer value is referred to as "interactive relativistic preference experience". From this point of view, Holbrook (1999) categorizes consumer value into three dichotomies: extrinsic versus intrinsic, self-oriented versus other-oriented, and active versus reactive.

- *Extrinsic* value pertains to a means-ends relationship where value lies in a product's functional, utilitarian service as a means to accomplish further purposes. *Intrinsic* value is a consumption experience appreciated as an end in itself, such as a day at the beach or listening to a symphony.
- *Self-oriented* is a value in which one prizes a product or experience selfishly for one's own sake, in other words, how one reacts to it or for the effect it has on him or her. *Other-oriented* looks beyond the self to some other(s), (such as family, friends, neighbors, colleagues, country, planet) for primary significance.
- *Active* involves a physical manipulation of a tangible object, for example, driving a car, or a mental manipulation, for instance, solving a crossword puzzle. *Reactive* results from appreciating, admiring or otherwise responding to some object, as can been seen in appreciation of a painting or assessment of the quality of a camera.

The work of Holbrook not only encompasses the definition and nature of consumer value, but also introduces a typology of values. Eight types of value were generated from the combination of the three preceding dimensions (extrinsic versus intrinsic; self-oriented versus other-oriented; active versus reactive) in a 2x2x2 table, namely: efficiency, play, excellence, aesthetics, status, ethics, esteem, and Spirituality.

Table 1: Typology of Consumer Value (Holbrook, 1999)

		Extrinsic	Intrinsic
Self-oriented	Active	*EFFICIENCY (Convenience)*	*PLAY (Fun)*
	Reactive	*EXCELLENCE (Quality)*	*AESTHETICS (Beauty)*
Other-oriented	Active	*STATUS (Success, Impression Management)*	*ETHICS (Virtue, Justice, Morality)*
	Reactive	*ESTEEM (Reputation, Materialism, Possessions)*	*SPIRITUALITY (Faith, Ecstasy, Sacredness, Magic)*

2.4 Findings from literature review

The literature review reveals an ambiguity in definitions and measurements of user value. Traditionally, authors tend to place value within an economic perspective, in which market choices and consumer preferences are driven by the monetary sacrifice people are willing to exchange for a product (such as Zeithaml (1988) and Monroe (1979)). This point of view became popular because of its direct reflection of product's commercial characteristics, however, it fails to take into consideration a number of intangible, intrinsic, and emotional properties of products (Sanchez-Fernandez & Iniesta-Bonillo 2007). For example, online public services have no monetary price attached to them (except the fee for the service itself), but are highly valued because they reduce waiting time and transportation efforts for users. Therefore, in this case, a utilitarian approach may not fully explain e-service use behavior.

The second concept discussed, led by Woodruff & Gardian (1996), extends the value concept by not only focusing on product's attributes but through also considering higher-order outcomes that the customer experiences. Although this reflects the complexity and dynamic nature of the concept, the authors did not specify particular user value types which could facilitate the construction of a measurement scale (Sánchez-Fernández & Iniesta-Bonillo, 2007).

In the current study, Holbrook's typology of consumer value (1999) is chosen as a foundational framework to reveal the nature of user value in e-government services for the following reasons.

First, by introducing eight types of value, Holbrook's framework supports the notion of value as a multidimensional concept which goes beyond traditional, oversimplified approaches that consider user value as money exchange or tradeoff between benefits and sacrifices. As indicated by previous studies on e-government service acceptance, not only do service's characteristics (such as quality, ease of use, or usefulness) impact decisions of acceptance, but there is also a positive correlation between citizens' acceptance behavior with "social influence", defined as the degree to which an individual's decision to accept or reject a systems is influenced by others (Venkatesh et al. 2003). This can be viewed as an expression of the "other-oriented" value in Holbrook's typology. Second, the paradigm of Holbrook views value as "relativistic", implying that user value is comparative, personal, and situational, which could be used to reflect the heterogeneity of online service users. Users' perceptions of online service differ depending on personal experiences, personalities, and preferences. Furthermore, the consumer value is "situational" in the sense that it is subject to the temporal circumstance in which the value judgment is made. For instance, import/export companies who interacted with custom services daily may recognize an online customs declaration system as more necessary than companies whose business requires only one or two transactions a month; or a resident whose apartment is next to the immigration bureau's office may not value e-visa applications as much as a resident who lives 20 kilometers from the office's location. Finally, Holbrook recognizes that consumer value is embedded in the consumption experience and not in the product itself. E-government services are evaluated not by their physical properties or price, but through the benefits or experiences they brings to online users.

It is obvious that online service use experience and context can be rich in value. For these reasons, Holbrook's framework is believed to capture a greater number of potential sources of value than other conceptualizations, and hence broadens an understanding of perceptions of online service users.

3. Holbrook's value typology and e-government services

Potential sources of user value in e-government service have been identified, grounded in Holbrook's framework and literature reviews concerning e-government service adoption. As suggested by Smith (1999), research does not have to embrace the framework as a whole, instead, the selection of value types should be subject to the research context and questions of interest. Among the eight types of value, *play* (the active engagement of a person with a product or service for fun, enjoyment, or happiness) and *spirituality* are not considered relevant to e-government services. For this reason, they are left for the future investigation. The remaining types include efficiency, excellence, status, esteem, aesthetics, and ethics, and are examined in the context of online services below.

3.1 Efficiency

In the typology, efficiency is an extrinsic value that is the outcome of the active use of a service to serve personal, self-oriented goals. In the context of e-government services, users can use the service to submit an application and receive results without physically interacting with a governmental agency. By doing so, a user does not have to waste his or her time waiting for hours to have an application received, and later does not have to return to the office to obtain results. Not to mention cases when users are asked to revise information or add required documents. This process takes more time and effort when it is handled manually. Clearly, online service can be considered to enable users to achieve goals, such as saving time and effort, or increasing economic conditions by devoting more time to other businesses.

3.2 Excellence

As indicated by Holbrook (1999), excellence, in general and in particular, arises as a consumer value type when an individual appreciates a product for its capability to achieve a self-oriented goal without directly interacting with it. As a reactive value, excellence emerges in periods of pre- and post-consumption (Oliver 1999). For example, before the service is used, value can be shaped through user's expectations and desires. A citizen does not necessarily need to file taxes online to be aware of several, common benefits of online tax services, such as 24/7 accessibility, secured authentication, and quick returning results. The value that arises in this phase helps users to anticipate the service's quality and may become a strong encouragement which leads to use. In post-use stages, value is realized through users' evaluation and judgment, and this type of value is closely linked to concepts of satisfaction or loyalty.

3.3 Status

In this context, status value refers to the active use of an e-government service as an extrinsic way to gain favorability (Holbrook 1999). In fact, digital services can be considered an innovative initiative which requires users to have a particular set of skills of information technology to participate. Therefore, a person believes that if he or she begins to use e-government services, his or her position or status would be enhanced in their community. As argued by Rogers (2003), the social reputation that an innovation offers its adopter can be seen as the sole benefit the adopter achieves.

3.4 Esteem

As an extrinsic, reactive, other-oriented value, esteem entails reactively appreciating the consumption of a product as a way to enhance one's other-oriented public image. Holbrook (1999) claims that there is a fuzzy line laying between *status*—an active value —and *esteem*— the reactive counterpart. While the former requires users to be actively involved in the use of the service, the latter denotes the awareness of citizens that using online services can help reflect their identity in society. For example, imagine a farmer living in a rural area who moves to a modern city. Surrounding by high-end technologies, such as the internet or smartphones, and seeing neighbors benefit from these technologies, the farmer may feel the urge to be inclusive with the living environment. In this case, without any actual use of these technologies, the farmer can still be aware that changing his or her lifestyle can help integration with those around. In the context of e-government services, research has noted that *social influence* is an important predictor of citizens' willingness to use an online service.

3.5 Aesthetic

Aesthetic appears as a special type of consumer value which is derived from an appreciation of consumption experience as a self-oriented end in itself (Holbrook 1999). It contains specific forms, such as beauty, appearance, and with regard to information systems, the user interface. As a common practice, online services are provided through a web-based portal where users can interact with government agencies via front-end user interface components such as forms, navigation, search box, hyperlinks, sitemaps, and so forth. These components are represented through primitive elements such as character fonts, layout, and color. It is not coincidental that governments place effort into redesigning and restructuring governmental user interfaces.

3.6 Ethics

From Holbrook's (1999) perspective, ethics arises as an intrinsic experience when an individual actively pursues an action for the sake of others. As observed by Holbrook (1999), the value of ethics has received little attention from consumer researchers. In e-government services, governments are embracing digital services with the primary target of increasing the transparency

of public administration procedures. By participating in e-government initiatives, citizens seek an effective solution to promote the government's transparency, control corruption in public bodies, and create a channel to engage with governmental decisions. The value in this case lies within the online service itself, and goes beyond self-oriented purposes to serve a public goal.

4. Methodology

The first steps in developing a scale to measure e-government service user value, as suggested by Churchil Jr. (1979), are to specify the domain of the construct and generate sample items. As there have been no previous efforts found in literature to measure the user value of e-government service, other methods, such as interviews or focus groups are applicable. Interviews and focus groups discussion are also recommended by Woodruff & Gardial (1996) as methods for gaining insight into complex phenomenon, like user value.

Based on these recommendations, 10 in-depth interviews were conducted with government officers in Haiphong city to assess the overall perception of e-government services. All participants have knowledge and experience in e-government implementation at their organizations. Four officers were from the Department of Information and Communication, the organization responsible for developing policy and strategy related to e-government and online public services. The remainder were public servants who current work in the One-Stop-Shop unit of various departments in the city. Each interview lasted approximately 30 minutes. Participants were asked to recount their experiences of various aspects of services implemented in their organization, the purpose and targets of online services, the benefits they expected these services to provide citizens, and the features or functionalities most important to citizens, among other questions.

To gain deeper insight into e-government service functionalities and features, two focus groups sessions were established among employees working in the Software division of the Department of Information and Communication in Haiphong city. As suggested by Woodruff & Gardial (1996), the primary advantage of this method is the stimulation of discussion and the brainstorming of ideas among participants. Participants were selected based on their experience operating various aspects of online service delivery, from implementing the applications and supporting customers to monitoring responses and feedbacks from end users. The first session included two user interface designers and six developers. The second session consisted of eight employees from the training and customer service unit. Each session lasted one hour. During sessions, participants were encouraged to discuss experiences deploying and monitoring online services at different organizations. The transcripts of focus group discussions and interviews were then content analyzed to extract potential questionnaire items.

Additionally, to enrich the survey items, constructs from previous studies on service quality were employed to generate items about the value of excellence. For example items measuring service availability and reliability were derived from the E-S-QUAL scale of Parasuraman et al. (2005), security items were adapted from the e-GovQual of Papadomichelaki and Mentzas (2012),

and customer supports items were taken from Ding et al. (2011). These researches are widely acknowledged for well-established theoretical backgrounds and empirical validity in the area of e-service quality.

As a result, a total of 51 original questionnaire items were generated based on participants' responses. Items were measured on a 5-point Likert scale where 5 denoted "strongly agree", 3 "neutral" and 1 "strongly disagree". In August 2015, questionnaires were distributed to the front office of four government agencies in Haiphong city where e-government services are available and frequently used by citizens. Citizens who came to collect their application results were asked to fill in the survey concerning value and other demographic information. In total, 240 questionnaires were collected, of which, 29 were removed due to missing data, resulting in 211 valid responses.

5. Data analysis

5.1 Exploratory factor analysis

After data was collected, an analysis of the sample size, outliers, factorability, and missing data was conducted to prepare the data for further analysis. With a sample size of 211, the ratio between the number of variables (31) and total number of respondents (211) is 1:7, which can be considered a reasonable sample size. Potential outliers in all questionnaire items were detected using standard deviation summaries and no outliers were found in the data collected. The result of Barlett's test of sphericity and the Kaiser-Meyer-Olkin's measure of sampling adequacy confirmed the factorability of the factor analysis.

A principle factor analysis with promax (oblique) rotation was employed to reveal underlying constructs of the user value scale. The number of factors/components to be retained is the tradeoff between the simplicity (as few factors as possible) and the completeness (as much variance as possible). Kaiser's rule suggests retaining factors with an eigenvalue greater than or equal to 1.0. Also, all items with a loading factor of 0.4 or above were included in the model. Twenty-six items were eliminated as they did not load on any factor, loaded significantly on two factors, or their wording did not fit with the factor's meaning it loaded on. As a result, the remaining 25 items loaded significantly on seven factors, with factor loadings ranging from 0.4 to 0.8. Based on loaded items, four factors were named: convenience value (3 items), quality value (14 items categorized in 4 sub dimensions: accessibility, reliability, guidance, and security), social value (3 items), and transparency value (5 items). The result is reported in Appendix 1.

5.2 Confirmatory factor analysis

Theories and the exploratory factor analysis suggest ideas concerning the number of underlying dimensions of the user value scale. A confirmatory factor analysis model was then established to verify the confidence of the measurement model which hypothesized about the relation between observed variables and latent variables.

Measurement model

The purpose of a measurement model is to confirm relations between observed variables and underlying factors. Four latent variables and corresponding items are represented in Appendix 2. The covariance of latent variables was allowed to be correlated together. The maximum-likelihood estimation procedure was employed to test the measurement model. The chi-square value was significant ($\chi 2(261) = 459.60$, $p = 0.00$). Other fit indices, including comparative fit index CFI, root mean square error of approximation RMSEA, and standardized root mean square residual SRMR, met the requirements (CFI >= 0.90, RMSEA <= 0.06 and SRMR <= 0.09). This indicates that the measurement model fits reasonably with the collected data. Additionally, all standardized loadings of observed items were statistically significant at 1% significance level with $p < 0.000$. The result is reported by Stata 13 in Appendix 2.

6. Discussion and conclusion

It is obvious that citizens and businesses are more aware of digital technologies and consequently have higher demands with the quality of online public services. They expect their governments to conduct consultative process with users more regularly to understand their expectations and deliver tailored online services to fulfill needs (Accenture 2014). The collaboration between governments and customers thus becomes a new approach in delivering online public services (OECD 2011). It is believed that digital service provision will create more public values if end users are engaged in the design, development, and production of the service. Whilst previous studies relied on the TAM and its extended versions (TAM2, TAM3, UTAUT) which focus mostly on technology's characteristics and users' self-oriented purposes, the current study explores a broader examination through applying user value concepts to e-government services. Moreover, by developing the EGSERVAL scale, this study provides an empirical method to measure user value.

Through this study, Holbrook's typology of consumer value was employed as the foundational theory to reveal value types raised before, during, and after interactions between users and e-government service. Based on Holbrook's proposal, six value types were evaluated in the context of public online services with reference to previous studies in the literature. However, based on the results of the empirical analysis in Haiphong city, only four types of value emerged: efficiency, excellence, esteem, and ethics. In the e-government service context, these value types arose under specific forms, called convenience, quality, social, and transparency respectively. Quality was developed as a higher-order value consisting of four sub value types: reliability, guidance, accessibility, and security. The measurement model validated the stability and reliability of this four-factor structure.

In terms of theoretical and managerial contributions, this study provides several recommendations for designing and delivering online services in Haiphong city. First, by exploring both *extrinsic* and *intrinsic* aspects of user value, this study supports the argument that value does not reside in the object itself, nor does it depend entirely on the subject's perception, but is constituted by

an interaction between a subject and an object. A common failure encountered by e-government projects is a focus on the product's properties without attention paid to users' characteristics. This is referred to as the "hard-soft gap" which describes situations "when a hard e-government design meets a soft (people, organizational, social) reality" (Heeks 2003). For instance, an IT application is valued and adopted in an organization because of a popular brand name, not through a consideration of whether it fits the current employees' skills. This suggests, to fully understand the value perceived by users of e-government services, policy makers should evaluate value in the interaction between a user and service to confirm whether specific solutions fit current users' characteristics.

Second, by considering online user value as *active* and *reactive*, this research emphasizes user experiences from which value is derived. From this point of view, what people want is not a product or service itself, but experiences that satisfy needs rendered by the product or service. As claimed by Mathwick et al. (2001), "the consumption experience itself can also be rich in value" and may "involve either direct usage or distanced appreciation of goods and services". Furthermore, value may differ before, during, and after use (Woodruff 1997). In this regard, it is suggested that developers should focus on improving user friendly interfaces and optimizing information flow to reduce manipulation activities required for users, thus providing positive experiences for users before and during the use of online services. Then, an evaluation process of users' satisfaction in the post-use stage is recommended to provide continued modifications and upgrades.

Finally, the social value that arose during the investigation supports the *other-oriented* perception, whereby online services are not only used because of personal self-purpose, but can also be appreciated for the benefits they provide to others. For this reason, policy makers should focus on broadcasting the advantages of online services over the Internet and media to increase awareness. More importantly, increasing citizens' IT literacy level is another way to accelerate the diffusion of e-government services.

The study is not without limitations. First, the EGSERVAL was conducted within the scope of a local government, thus it is hard to generalize the result. Moreover, potential values may be revealed in other contexts. It is suggested that future studies take into consideration the influence of various demographics and contextual factors (age, gender, education, usage frequency, service type) to comprehend the user value scale. Finally, an investigation into the predictive power of user value on user behavior (intention to use, actual usage, satisfaction) is necessary to confirm the suitability of the scale.

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Appendix 1. Results of factor analysis for user value

Factors	Variable name	Factor loading
Convenience value		
I believe that e-government service will help me to save waiting time	waiting_time	0.4193
To me, e-government service is convenience	convenience	0.7836
To me, e-government service is easy to use	easy_of_use	.0.7071
Transparency value		
E-government service helps to increase my trust on government	trust	.7497
E-government service helps me to save more expenses	cost_saving	0.5578
I believe I will be served better when communicating with government via e-government service	being_served	0.7240
I believe information will become more transparency with e-government service being used.	transparency	0.6230
Using e-government service helps me to avoid unexpected problems	uncertainty	0.6006
Social value		
Using e-government service brings more benefits to people around me	benefits	0.5970
Using e-government service is a popular trend at my place	tech_trend	0.6829
I heard about many positive things from using e-government service	word_of_mouth	0.7068
Quality value - Reliability		
My application result is returned on time	ontime_return	0.4377
Responded information is correct	correctness	0.8721
Procedure information is accurate	accuracy	0.7574
I received responses after sending my application	responsive	0.6327
Quality value - Guidance		
If there was any issue with my application, I would had been guided on what to be done	guidance	0.4867
There is a customer service unit for the online service	customer_service	0.7264
I can easily contact with customer service unit	contact_info	0.6681
Staffs show enthusiasm and willingness to help applicants	well_support	0.8032
Instructions about service procedures are clear and easy to understand	instruction	0.6924
Quality value - Accessibility		
I did not encounter any technical trouble when accessing online service	trouble	0.7603
E-government service site is rarely crashed	crash	0.7722
Quality value - Security		
My account information is secured	secure_login	0.7610
My personal data is protected	data_protection	0.8230
The data I provided will not be used for any other purposes.	secure_info	0.7654

Appendix 2: The measurement model of EGSERVAL scale