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# The Influencing Path of Public Engaging Intention in the Value Co-Creation of E-Gov Services: An Empirical Investigation

Completed Research Paper

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## Abstract

*The wide acceptability of ICTs and social media enriches the delivery platform of e-gov services (EGS). EGS is an important interaction and collaboration channel between the government and the public. The public can conveniently and timely explore problems, provide ideas, and design solutions to improve EGS. The roles of the public changed to active, informed partners or co-creators of EGS innovation and problem solving. This study builds the influence factor model on public engaging intention of value co-creation for EGS based on technology acceptance theory, trust theory, and motivation theory to explore impact factors and impact paths. Path analysis interpreted how the public would accept and adopt value co-creation behavior for EGS. This study also introduced a comprehensive picture of the new paradigm of public service value creation in an era of increasing user dominance, that is, the public.*

**Keywords:** E-gov service, Value co-creation, Technology acceptance length, Public engaging intention, Social media

## **Introduction**

The Internet exerted increasing influence on people's lifestyles given the development of ICT (Zhou, Ma, and Xu 2012; Nambisen and Nambisen 2013; Hu et al. 2012). E-gov services (EGS) received increasing attention from the public to the government (Subbiah and Ibrahim 2011; Wang et al. 2006; Pan, Hu, and Ma 2016). The wide application of government social media, such as government microblogs, WeChat accounts, and apps, expanded the scope of service-providing platforms and approaches in government to public interaction (Diaz-Diaz and Perez-Gonzalez 2016; CNNIC 2017). However, the demand for public services will not be met if they are not identified in the first place. Government agencies or organizations that bear the responsibility of providing EGS often have limited visibility of the demand context; sometimes, they remain unaware of these demands until urgent solutions become necessary (Nambisen and Nambisen 2013). Individuals who revolve around these contexts are likely to be the first to gain awareness of these service needs. The disconnect between citizens who have knowledge about these demands and the government agency equipped to meet these demands results in failure to identify these needs in a timely manner. When these demands are identified, sometimes they are not defined accurately, thereby leading to inefficient and/or costly services. New technologies and mechanisms can help address this issue and enable citizens to assume an active role in discovering, identifying, and defining the public services that need to be provided (Feller, Finnegan, and Nilsson 2010; Grönroos and Voima 2013; Hu et al. 2013). Therefore, the value creation pattern of government service transformed from independent government creation to collaborative co-creation (Christansson, Axelsson, and Melin 2015; Luna-Reyes et al. 2016). The role of the public in the value creation process of government services then changes. The public is not only the user and receiver of EGS, but also the value co-creator (Subbiah and Ibrahim 2011; Luna-Reyes et al. 2016; Osei-Frimpong, Wilson, and Lemke 2018). Increasing volumes of information and data resources are made available on big data-based platforms of the government. This development motivates public involvement and develops abilities related to the construction, design, supply, and improvement of EGS to create increased value for public service and satisfy personal and social needs.

Government websites of China that are located in various provinces and cities opened public participation channels for value co-creation activities (Hu et al. 2014; Chen, Vogel, and Wang 2016; UNDESA 2016). The public can discover problems and express opinions, comments, and suggestions to related government functional departments through methods such as e-participation, e-petitions, online questionnaires, online interviews, and electronic message boxes (Linders 2012).

However, value co-creation is an interactive process and service value can only be created through joint efforts of all participants in the value co-creation process (i.e., citizens, IT providers, and government agencies). Thus, in addition to value co-creation platforms and channels, government and public participation are also important factors that influence EGS value co-creation. Public participation will depend on their willingness and attitude toward EGS value co-creation. What are the factors that influence public engaging intention (PEI) toward EGS value co-creation? How will these factors influence PEI? Understanding the reasons for this behavior is vital to the adoption of EGS value co-creation. In this study, the gap is fulfilled by developing a SEM model that aims to investigate the factors that affect the public engaging intention of EGS value co-creation. This study also attempts to explain the behavioral characteristics of public participation in value co-creation along with the intention to promote the creation and transformation of EGS value and the effects improvement in EGS value co-creation.

## EGS value co-creation

### *Value co-creation*

Value co-creation is a new trend in service science, particularly in information management and service domain (Vartiainen and Tuunanen 2016; Osei-Frimpong, Wilson, and Lemke 2018). In this study, the dominant marketing logic is transformed from a Good Dominant (G-D) logic to a Service Dominant (S-D) logic and the role of consumers changes from passive product and service recipients to active development partners (Vargo and Lusch 2004; Prahalad and Ramaswamy 2004); this framework leads to the assumption that the value creation process is transformed from enterprise- and product-centered to individual- and experience-centered (Liu, Xin, and Ren 2011; Xie et al. 2016). The development of the value co-creation concept underwent the process of “metaphor theory to specializing customer behavior”.

Value co-creation theory, which is a new value creation model in the field of business, gained significant attention from scholars, who explained its general concept and connotation from different perspectives (Table 1).

**Table 1. Various viewpoints of value co-creation**

Authors	Viewpoints
Zeithaml et al. 1990	Service providers and consumers create value together through cooperation and interaction.
Prahalad and Ramaswamy 2004	Co-creation builds a connection between enterprises and consumers. Enterprises actively engage in dialogues with consumers instead of catering to consumers. In this way, both sides participate in the construction of service experience.
Vargo and Lusch 2004	Emergence of service dominant (SD) logic has reinstated that the firm is merely the facilitator of value proposition and it is the customer who co-creates value
Xie, Bagozzi, and Troye 2008	Value co-creation are presumptions because value creation activities undertaken by the consumer result in the production of goods that they eventually consume, which becomes their consumption experiences.
Adeleke and Abdulrahman 2011	Cooperative activities launched by product and service providers to promote product and service innovations give providers and consumers mutual benefits.
Liu, Xin and Ren 2011	Value co-creation is a positive interaction between consumers and enterprises where consumers contribute their labor and wisdom actively and produce and provide more valuable products, services and experiences for consumers through the cooperation with enterprises in invention and design.
Grönroos and Voima 2013	Value co-creation refers to customers' creation of value-in-use where co-creation is a function of interaction.
Vartiainen and Tuunanen 2016	Value co-creation and co-destruction are especially interesting in relation to information systems (IS) because they simultaneously occur when IS is used for collaboration.
Uppström and Lönn 2017	Value is co-created and co-destroyed in the collaborative processes. Value co-creation is complex when the boundaries between collaborating communities are complex; when boundaries are complex, collaboration requires complex IS artifacts in e-government.
Osei-Frimpong, Wilson, and Lemke 2018	Effective value co-creation activities require service providers to adopt delivery approaches that would effectively integrate user resources to co-create value.

### ***EGS value co-creation and related studies***

Value co-creation theory was disseminated quickly from the marketing field where it was originally formed to the fields of public service, society governance, manufacturing, education, and other fields. In the field of EGS, the government and the public (citizen, enterprise, government employee, social group, and non-governmental organization) are starting value co-creation in traffic services, food security, social work, environmental protection, policy making, and neighborhood maintenance. A case summary suggests that the government first provides relevant information and skills in public service and service provision for relevant users through EGS platforms. These platforms relate to the physical or virtual venues of citizen co-creation by facilitating knowledge-sharing and interaction among participants and modularizing or partitioning the problem-solving process. The public then perceives the quality of service according to their demands while capturing and consuming these services. The public can interact with government employees via participation channels, such as one-stop government portal websites, government microblogs, WeChat accounts, and apps. Based on relevant knowledge and skills, they can fully express their expectations, requirements, and suggestions for EGS design, provision, and improvement. Four distinct roles of citizens in co-creation are identified, namely, explorer, idea creator, designer, and diffuser (Nambisan and Nambisan 2013). Finally, the government can adequately understand the real desires and demands of the public. Though joint public efforts, the government would provide EGS experience with increased effectiveness, efficiency, and capability to meet personalized demands. The governments of other countries, such as the United States, Australia, Greece, Korea, Canada, and China, embarked on novel initiatives to engage citizens and organizations in collaborative innovation and problem-solving (Nambisan and Nambisan 2013). Examples of co-creation in government services include crowdsourcing initiative of the U.S. government (i.e., Challenge.gov), FixMyStreet initiative, which was launched in the United Kingdom, the initiative of the Danish government to co-create climate strategy with citizens (Climate Consortium Denmark), and the “e-People initiative” of the South Korean government to support online civil petitions. Singapore applied value co-creation in its “2011–2015 e-government masterplan” (eGOV2015), which explicitly pointed out that the delivery of EGS in this phase will be converted from “Government-to-You” to “Government-with-You”; the goal of this initiative was “through more interaction and value co-creation activities between the government, the public and the private sectors, to create better service value experience for Singapore citizens”.

Existing studies related to EGS value co-creation in the academic field mainly focused on the participation process, value co-creation tools (system), and approaches to promote value co-creation. Research on the participation process mainly emphasizes the interaction process of the government and public participation in value co-creation (Adeleke and Abdulrahman 2011; Subbiah and Ibrahim 2011; Uppström and Lönn 2017). The government and the public use government IS artifacts in the process of value co-creation to “close” each other and establish dialogues; thus, EGS is an indispensable part of value co-creation (Thomas, Autio, and Gann 2014). Scholars exerted efforts to identify approaches to promote the effectiveness and efficiency of value co-creation (Olphert and Damodaran 2004; Bridge 2012; Ahmed, Mehdi, and Moreton 2012; Feller, Finnegan, and Nilsson 2010).

### **Research Model and Hypothesis**

One of the value co-creators in EGS is the service provider, who is known as the public agency (or the government). The other entity is the public (or social users), which could pertain to citizens, government employees, private businesses, or social communities. This study aims to explore the possible influencing factors that affect the intention of social users to engage in EGS value co-creation.

#### ***Technology acceptance factors on PEI***

Venkatesh (Venkatesh, Morris, & Davis, 2003) introduced the Unified Theory of Acceptance and Use of Technology (UTAUT), which was combined with eight user behavior theories and models. In UTAUT, personal use intention is affected by performance expectancy (PE), effort expectancy (EE), and social influence (SI) and restricted by gender, age, experience, and volunteerism. Performance

expectancy is defined as the degree to which an individual believes that the use of the system will help him or her improve job performance; empirical study proved to be the most powerful influencing factor of the intention to use information technology (Venkatesh, Morris, & Davis, 2003). Effort expectancy is defined as the degree of ease associated with the use of a system. Samsudeen and Thelijjagoda (2015) studied the influence factors of intention to use EGS among students in Sri Lanka University; their result shows that effort expectancy is an important factor that affects use intention. Zhou, Ma, and Xu (2012) found that the ease of operation of a mobile government system is the primary consideration in the decision to use mobile e-government.

Social influence is the degree to which an individual perceives that the external environment will influence their use of the target system, which includes media influence and interpersonal influence (Shao & Yang, 2011). In EGS value co-creation, the process of public participation is completed through specific platforms, such as government service websites, microblogs, WeChat accounts, and apps; thus, public participation in value co-creation can be viewed as the acceptance of the technology adopted in EGS. This study suggests that increased technological acceptance of value co-creation platforms increase the willingness of the public to engage in value co-creation.

Therefore, this study proposes the following hypotheses.

**H1:** PE, EE, and SI positively influence the technological acceptance (TA) of the public of value co-creation platforms for EGS.

**H2:** The TA of the public toward value co-creation platforms positively influences PEI toward EGS value co-creation.

### ***Trust factors of PEI***

Trust is the expectation of the reliability of commitment made by individuals or organizations (Rotter, 1971); the role and function of trust is fully reflected in socio-economic exchange (Venkatesh, Morris, & Davis, 2003). Literature suggests that trust maybe viewed as an important factor that influences the adoption of EGS (Meyer & Wagner, 2014). The objects of trust have two types, namely, trust in the entity of service provision and trust in the channels of service provision (Tan & Thoen, 2000). Before using electronic services, users should consider the characteristics of the service providers and the technical infrastructures (Pavlou, 2003; Luqman et al., 2017). Therefore, trust in EGS should include the trust in EGS entity, which is known as trust in the government (TG) and the trust in the reliability of applied technology, which is known as trust in the platform (TP). The government and the public are two essential entities of value co-creation in EGS value co-creation. The government provides value co-creation channels and the public participates. The belief of the public that the government has a positive attitude toward public participation in value co-creation is important when they are deciding to participate in value co-creation (Liu & Yu, 2017; Alzahrani, Al-Karaghoul, & Weerakkody, 2017).

Therefore, the study considers that public trust (PT) influences engaging intention toward value co-creation, the high public trust leads to stronger engaging intention. At the same time, the public trust in the government and the value co-creation platforms influences the overall public trust. The high public trust in the government leads to strong public engaging intention toward value co-creation. The great public trust in the platforms leads to strong engaging intention toward value co-creation.

The following hypotheses are then proposed.

**H3:** TG and TP positively influence public trust (PT).

**H4:** PT positively influences PEI to participate in EGS value co-creation.

### ***Motivation factors of PEI***

Motivation is the core principle in understanding individual behavior (Chen, & Xie, 2007; Alzahrani, Al-Karaghoul, & Weerakkody, 2017) and the driving force for motivating individuals to take action

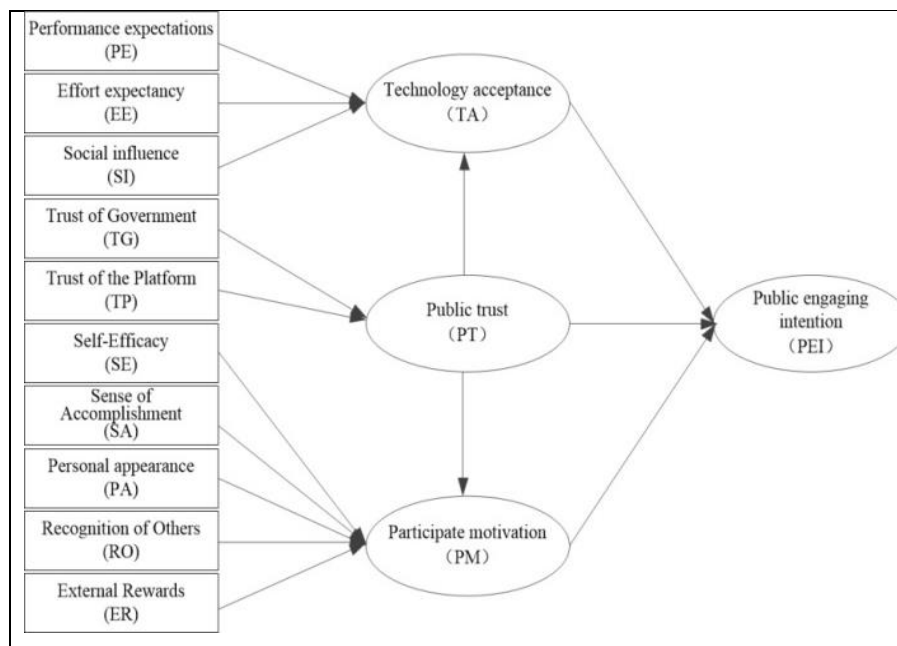
and achieve goals. Motivation theory examines behavior attitude, behavior intention, and actual behavior of information users from the angle of psychology and behavior, including self-efficacy, sense of achievement, personal appearance, recognition, and external rewards (Wu, Chen, & Ju, 2014).

Self-efficacy is a measure of confidence in the ability of an individual to achieve a goal. Self-efficacy is not the actual ability of an individual, but rather the cognition of its ability (Weng, Zhang, & Gong, 2013; Yousefian, 2015). The sense of achievement is a psychological feeling generated when a person strikes a balance between desire and reality (Venkatesh, Morris, & Davis, 2003; Wu, Chen, & Ju, 2014; Oni et al., 2017). This study believes that if the public obtains an inner sense of achievement and satisfaction in EGS value co-creation as a result of providing valuable information to others and helping them solve problems or adopt suggestions, then they will have increased willingness to participate in EGS value co-creation. Scholars explored the enhancement of personal appearance as one of the influence factors in the study of PEI (Zhao, 2009; Oni et al., 2017). According to Füller, recognition from others is an important factor that influences public participation (Füller, 2010). According to theory of motivation, individuals participate in an activity to obtain external rewards (Chen, & Xie, 2007; Zhao, 2009; Alzahrani, Al-Karaghoul, & Weerakkody, 2017). When an individual believes that his or her behavior will produce expected results, such an individual is driven by practical motivations. Practical motivations include external rewards, such as economic returns.

Therefore, this study believes that self-efficacy, sense of achievement, personal appearance, recognition, and external rewards may influence on the PEI to EGS value co-creation. Thus, this study proposes the following hypotheses.

**H5:** SE, SA, PA, recognition from others (RO), and external rewards (ER) have positive influence on the participation motivation (PM) of the public.

**H6:** PM has a positive influence on PEI to EGS value co-creation.



**Figure 1. Research Model**

This study considers that technology acceptance will be high when the public has a high degree of trust in the government and EGS co-creation platforms (Luqman et al., 2017). Public trust in the government and platforms may allow them to think that participating in value co-creation via the platform can improve personal appearance and gain recognition and external rewards. Thus, the study also raises the following hypotheses.

**H7:** PT has positive influence on TA of value co-creation platforms.

**H8:** PT has positive influence on PEI to EGS value co-creation.

Fig. 1 present the research model based on the above hypotheses. This study tries to explore the influence effects and paths by analyzing the relationships of the three factors, namely, public trust (PT), participation motivation (PM), and technology acceptance (TA) on PEI (PEI) to EGS value co-creation, which constructed the research model.

## Empirical Study

### Data collection

We examined the research model using data collected from subjects involved in, participating in, or have future plans through various channels to participate in EGS value co-creation. Most of these subjects used EGS channels at home or in government service centers (offline service windows). Each concept in the research model was surveyed by 3 to 4 items. Respondents answered the questions through a five-point Likert scale with options ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). The scale used in this study was designed based on the mature scale. Some items were slightly amended according to actual needs. Before the formal survey, 86 people were randomly chosen for the pre-survey. Data were collected for three months (from January to March 2016), and a total of 339 questionnaires were returned with 50 considered as valid after strict data quality analysis. Finally, 289 were considered valid and used for the following analysis.

### Demographics and descriptive statistics

Of the 289 respondents, approximately 48% and 52% were males and females, respectively; 94.5% had undergraduate and above diplomas. In terms of area and position coverage, the respondents were from 15 provinces and Beijing, Shanghai, Tianjin, and other 18 regions abroad. A total of 225 respondents were aged 18 to 35, accounting for 88.2%. The detailed demographic background of the respondents is shown in Table 2, in which the survey respondents are generally highly educated and young.

### Reliability and validity test of the model

**Table 2. Basic information statistics of subjects (n=289)**

Statistic characteristics	Categories	N	Percentage	Accumulated percentage
Gender	Male	138	47.8%	47.8%
	Female	151	52.2%	100%
Age	<18	4	1.4%	1.4%
	18-25	155	53.6%	55%
	26-35	96	33.2%	88.2%
	36-45	15	5.2%	93.4%
	46-55	12	4.2%	97.6%
	>55	7	2.4%	100%
Education level	Junior college and below	16	5.5%	5.5%
	Bachelor's degree	117	40.5%	46%
	Master's degree	144	49.8%	95.8%
	Doctorate degree	12	4.2%	100%

The models were tested through SEM using SPSS/PC version 21.0 and AMOS version 21.0. Given that instruments were not fully examined in previous works, we tested the instruments using two independent stages in accordance with McDonald and Ho (2002). The first-order confirmatory factor analysis (CFA) and hierarchical CFA (HCFA) were applied to appraise the measurement model. Structural equation analysis was used to appraise the structural model. In statistics, CFA is used to test



whether measures of a construct are consistent with a researcher's understanding of the nature of that construct (or factor) and whether the data fit a hypothesized measurement model (Bentler, 1990; McDonald & Ho, 2002).

### Reliability test

**Table 3. Parameter estimates and factor analysis (n=289)**

Factor	Item	Std. factor loading ( <i>p</i> )	Cronbach's $\alpha$	KMO	Factors explained variance	$R^2$	CR	AVE
Performance Expectancy (PE)	PE1	0.752 <sup>(a)</sup>	0.858	0.811	70.512	0.566	0.864	0.615
	PE2	0.859 <sup>(***)</sup>				0.738		
	PE3	0.835 <sup>(***)</sup>				0.697		
	PE4	0.678 <sup>(***)</sup>				0.460		
Effort Expectancy (EE)	EE1	0.785 <sup>(a)</sup>	0.871	0.811	72.267	0.616	0.873	0.631
	EE2	0.785 <sup>(***)</sup>				0.616		
	EE3	0.830 <sup>(***)</sup>				0.689		
	EE4	0.777 <sup>(***)</sup>				0.604		
Social Influence (SI)	SI1	0.863 <sup>(a)</sup>	0.877	0.781	73.190	0.745	0.879	0.645
	SI2	0.863 <sup>(***)</sup>				0.745		
	SI3	0.717 <sup>(***)</sup>				0.514		
	SI4	0.760 <sup>(***)</sup>				0.578		
Self-Efficacy (SE)	SE1	0.738 <sup>(a)</sup>	0.810	0.767	63.818	0.545	0.811	0.518
	SE2	0.706 <sup>(***)</sup>				0.498		
	SE3	0.751 <sup>(***)</sup>				0.564		
	SE4	0.682 <sup>(***)</sup>				0.465		
Sense of Accomplishment (SA)	SA1	0.891 <sup>(a)</sup>	0.887	0.742	81.628	0.794	0.888	0.726
	SA2	0.840 <sup>(***)</sup>				0.706		
	SA3	0.824 <sup>(***)</sup>				0.679		
Personal Appearance (PA)	PA1	0.774 <sup>(a)</sup>	0.900	0.812	76.929	0.599	0.902	0.696
	PA2	0.875 <sup>(***)</sup>				0.766		
	PA3	0.859 <sup>(***)</sup>				0.738		
	PA4	0.826 <sup>(***)</sup>				0.682		
Recognition of Others (RO)	RO1	0.867 <sup>(a)</sup>	0.879	0.826	73.839	0.752	0.884	0.655
	RO2	0.824 <sup>(***)</sup>				0.679		
	RO3	0.799 <sup>(***)</sup>				0.638		
	RO4	0.743 <sup>(***)</sup>				0.552		
External Rewards (ER)	ER1	0.722 <sup>(a)</sup>	0.876	0.711	80.190	0.521	0.881	0.713
	ER2	0.910 <sup>(***)</sup>				0.828		
	ER3	0.889 <sup>(***)</sup>				0.790		
Trust of Government (TG)	TG1	0.795 <sup>(a)</sup>	0.874	0.738	79.993	0.632	0.875	0.700
	TG2	0.881 <sup>(***)</sup>				0.776		
	TG3	0.832 <sup>(***)</sup>				0.692		
Trust of the Internet (TI)	TI1	0.871 <sup>(a)</sup>	0.853	0.718	77.305	0.759	0.856	0.666
	TI2	0.749 <sup>(***)</sup>				0.561		
	TI3	0.823 <sup>(***)</sup>				0.677		
Engaging Intention (EI)	EI1	0.881 <sup>(a)</sup>	0.899	0.742	83.384	0.776	0.902	0.754
	EI2	0.811 <sup>(***)</sup>				0.658		
	EI3	0.910 <sup>(***)</sup>				0.828		
In total			0.942	-	77.131	0.896	-	-

<sup>a</sup> Parameter fixed at 1.0 in the original solution. CR, composite reliability; AVE, average variance extracted. \*\*\**p* < .001.

The reliability test mainly examines the inner consistency of the construct to investigate whether the same set of questions in the questionnaire are the measures of the same concept (McDonald & Ho,

2002). Therefore, this study applies internal consistency analysis and adopts Cronbach's  $\alpha$  to evaluate the consistency and stability of the questionnaire items (Hatcher, 1994; Qiu & Lin, 2009). The reliability coefficient of the construct is shown in Table 3.

According to Table 3, Cronbach's  $\alpha$  of each measurement of the study exceeds 0.8 and the overall construct of Cronbach's  $\alpha$  is 0.942. This result shows that the measurement items in the questionnaire have high consistency and stability and the construct indicates acceptable reliability for all latent variables (factors).

#### Validity test

Validity test is a measure of the effectiveness of the questionnaire data, which refers to the degree to which the questionnaire can reflect the measurement goals and intentions (Bentler, 1990; Qiu & Lin, 2009; McDonald & Ho, 2002). In this study, content and structure validity were examined. Content validity mainly measures whether the item can represent the content needed to be measured (Tabachnicka & Fidell, 2007; Qiu & Lin, 2009). Structure validity refers to the reflection degree by measurement tools of the internal structure of the characteristics and concept of the theoretical hypothesis (Tabachnicka & Fidell, 2007; Qiu & Lin, 2009). The study applies exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to analyze the structure validity. KMO and Bartlett's test for the scale are tested in this study. The results are shown in Table 3. The analysis result demonstrates that the design of questionnaire items is good. CFA method was used to perform structure validity analysis, including convergent validity and discriminate validity. Convergent validity is usually tested with Cronbach's  $\alpha$  value (see Table 3) and composite reliability (CR). The results of validity analysis are listed in Table 3. The average variance extracted (AVE) of the observed variables shows that the observed variables all passed the test of discriminate validity according to Tabachnicka and Fidell (2001, 2007) and Qiu and Lin (2009). In conclusion, the questionnaire used in the study has good structural validity.

#### Structural model test

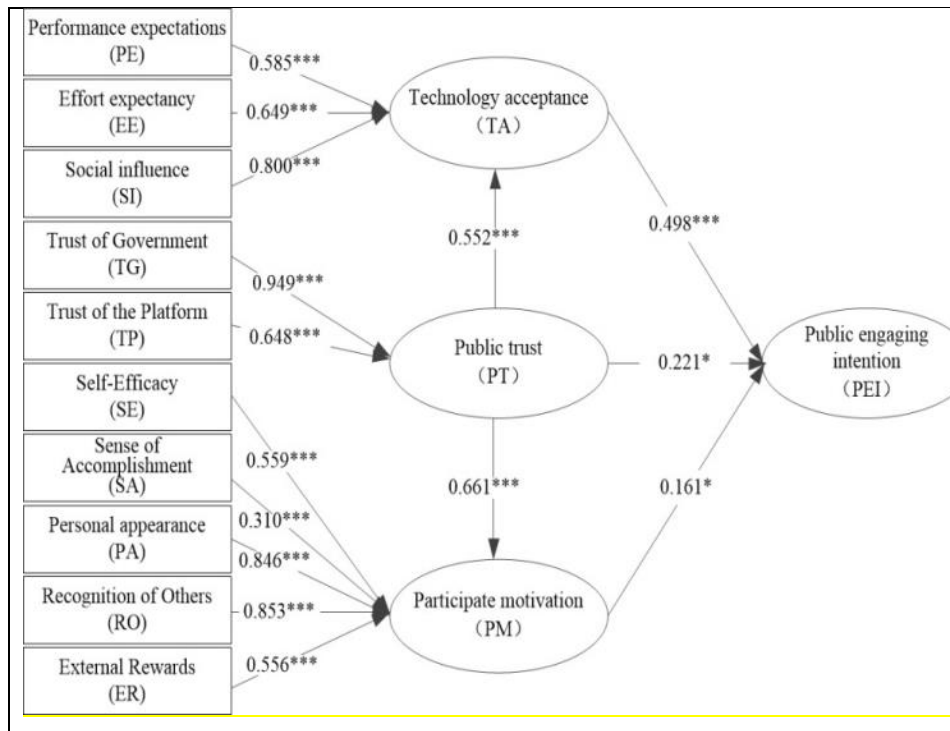
Absolute fitness, incremental fitness, and simple fitness indexes were chosen to test the goodness of fit of the structural model using HCFA. The absolute fitness indexes include GFI, RMR, and RMSEA; the incremental fitness indexes include NFI, CFI, RFI, IFI, and TLI; the simple fitness indexes include PGFI, PCFI, and  $\chi^2/df$ . The fitness indexes of this model are shown in Table 4. The fit measures and parameters indicate that the structural model exhibited adequately fits the observed data.

**Table 4. Fitness test results of the structural model (n=289)**

Fit indices	Absolute fitness index			Incremental fitness index					Simple fitness index		
	RMR	RMSEA	GFI	NFI	RFI	IFI	TLI	CFI	$\chi^2/df$	PGFI I	PNF I
Reference values	<0.05	<0.08	>0.8	>0.8	>0.8	>0.8	>0.8	>0.8	1-2	>0.5	>0.5
Test results	0.048	0.051	0.830	0.856	0.843	0.932	0.926	0.932	1.753	0.724	0.786

#### Hypothesis test

Path analysis of the structural model was conducted using AMOS with maximum likelihood estimation. The standardized regression coefficients of each variable are shown in Fig. 2. The standardized regression coefficient, standard error,  $t$ -value, and  $p$ -value of each variable are shown in Table 5.



**Figure 2. Path coefficient of the hypothesized structural model**

According to the result of empirical analysis (see Fig. 2 and Table 5), the standardized path coefficient between technology acceptance and performance expectancy, effort expectancy, and social influence is 0.585, 0.649, and 0.800, respectively. Thus, H1 is supported. The path coefficient between trust and trust of the government, trust of the Internet is 0.949 and 0.648, respectively, which shows that H3 is supported. The path coefficient between participation motivation and self-efficacy, sense of accomplishment, personal appearance, recognition of others, and external rewards is 0.559, 0.310, 0.846, 0.853, and 0.556, respectively, which indicate that H5 is also supported. A comparison of path analysis results with the reference standard shows that H2, H4, H6, H7, and H8 are supported.

**Table 5. Result of path analysis (n=289)**

Path	Std. structure coefficient ( <i>p</i> )	<i>T</i> -value	Hypothesis test result
Public trust → Public engaging intention	0.221(*)	2.403	Support
Public trust → Technology acceptance	0.552(***)	5.545	Support
Public trust → Participation motivation	0.661(***)	5.696	Support
Technology acceptance → Public engaging intention	0.498(***)	5.665	Support
Participation motivation → Public engaging intention	0.161(*)	1.949	Support

### Discussion of implications

The results of the empirical study show that the public trust has positive influence on the PEI to EGS value co-creation ( $\beta=0.221, p<0.05$ ), which means the higher the trust that the public perceive, the engaging intention to value co-creation will be stronger. Public trust is decided by the trust of the government and the trust of the channels adopted by value co-creation (Alzahrani et al., 2017). Therefore, the public will have confidence to participate in the interaction with the government when the public perceive that the public-oriented concept level of the government is high or attitude toward value co-creation is positive. Likewise, trust in the security and reliability of the value co-creation platforms will be high, and the public will have strong willingness to participate in the EGS value co-creation when the public are assured that their personal information and privacy security can be

effectively guaranteed in the process of information interaction, and the information they provide can be delivered accurately, completely, and timely (Nambisan & Nambisan, 2013). Therefore, the government should take various effective methods to improve the public trust in the government and value co-creation platforms.

Technology acceptance has a significant positive impact on the PEI to EGS value co-creation ( $\beta=0.498$ ,  $p<0.001$ ), which means the greater the public acceptance of value co-creation technology, especially mobile platforms such as government microblogs, WeChat accounts, apps, the stronger their engaging intention. The public's technology acceptance of platforms is affected by performance and effort expectancy, and social influence (Venkatesh, Morris, & Davis, 2003). Hence, when the public feel that their participation in value co-creation through the platforms can improve the performance of government service, such as an optimized process of the transaction service or services meet personalized needs, the public will be willing to participate in value co-creation. The ease of use of EGS value co-creation directly affects the efforts needed to be paid in the process; when the design of platforms is easy to operate and the process is simple to use, the public's willingness to participate in value co-creation through this platform will be positive. Whether the public provide information to the government to create value together via platforms is affected by the surroundings, and thus the encouragement of value co-creation behavior from the government and the effective promotion of media and model power from those who contribute in the value co-creation will all enhance PEI (Alzahrani et al., 2017). Therefore, the government should create multiple aspects that combine different ways to improve the public technology acceptance of the EGS value co-creation platforms through improving interface and process design and reducing the complexity of technology

PEI is also influenced by self-efficacy, sense of accomplishment, personal appearance, recognition, and external rewards. According to the result of hypothesis examination, participation motivation has a positive influence on the PEI in EGS value co-creation ( $\beta=0.161$ ,  $p<0.1$ ), but its influence degree is not strong compared with other factors. The following reasons were obtained through random interviews:

In mainland China, most value co-creation channels of EGS are relatively inconvenient, and governments have tried to open interaction channels like forms of mayor's email box, electronic community (i.e., mobile app), and bulletin board system (BBS). The public is not willing to participate into the interaction with EGS agencies. However, even the public provides information, explores problems, contributes ideas, and proposes advices because of the absence of criteria for evaluating participation contribution and suitable incentive policy for public willingness in EGS value co-creation.

With the development of the open government data (OGD) initiatives, some provincial governments, such as Guangdong, Zhejiang, and Shanghai, have paid efforts in organizing application and innovation competition to encourage citizens and businesses to utilize OGD resources. However, because of the absence of periodical organizations and incentive mechanism, the public cannot get any rewards when participating in most of the EGS-based value co-creation activities.

In addition, according to the result, the public trust has relatively significant positive influence on the technology acceptance of value co-creation platforms ( $\beta=0.552$ ,  $p<0.001$ ). In the process, the government usually acts as a sponsor of value co-creation activities, develops the system suitable for value co-creation, or provides platforms for communication activities. Therefore, the trust of the government would impact on the public's acceptance of the value co-creation platforms. When the public have high trust in the provided platforms, they are willing to use the platforms to provide information, explore problems, propose advices, and design solutions. Similarly, when the public have high trust in the security and stability of platforms, they will think that the platforms are reliable and be more willing to use them as mentioned above.

Results show that "trust" has significant positive influence on public participation motivation ( $\beta=0.661$ ,  $p<0.001$ ). The activities of value co-creation are usually initiated by the government and public participation in terms of co-operators, collaborator, and co-designer (Linders, 2012; Nambisan &

Nambisan, 2013; Luna-Reyes et al., 2016). The higher the public trust in the government and platforms, the stronger the public perception that participating in value co-creation via the platform can improve personal appearance and gain recognition and external rewards. However, the public has a strong perception that they will gain the rewards of scores, honor certification, and even cash.

This study proposes the following suggestions: firstly, improving public trust to promote public participation. The government should disseminate cases and scenarios to the public to improve the public's perception of EGS value co-creation. Through such scenarios, the public can possibly gain a deep understanding of EGS value co-creation. The government should expand, improve, and elevate the feedback process of value co-creation platform in terms of improving the quality and efficiency of information feedback. The government should be more concerned about the personal information security and privacy issues when the public are participating in the value co-creation. Furthermore, the public should be informed how the platforms and infrastructures are operated, protected, and maintained by opening the city information center, which can also enhance sense of trust.

Secondly, improving technology acceptance of the public to co-create EGS value. In mainland China, the co-creation of the EGS value still mainly depends on the government information infrastructures although the dominant position of the government is in EGS provision. The convenience and usability of those platforms are helpful in enabling the public to accept the EGS and the emerging technology, such as big data and artificial intelligence (AI). Hence, the design of co-creation platforms and interacting technologies should consider characteristics of users with different ages and cultural levels to ensure that the public can conveniently and easily use the platforms.

Thirdly, inspiring the internal and external participation in the EGS value co-creation. Cultivating knowledge and skills through a variety of ways, and taking various measures help the public find their own capabilities and increase their confidence in self-efficacy to participate in the EGS value co-creation activities. Additionally, the government can inspire the public to participate in the value co-creation by giving bonus and rewards.

This study has limitations, one of which is related to non-response bias normally associated with surveys. Determining how respondents differ from non-respondents is possible. First, although the respondents were indiscriminately selected from 33 regions in mainland China and overseas, non-response might occur under certain circumstances, which could result in measurement bias. Second, the research that combines the theory of technology acceptance, trust theory, and motivation theory discovered the influence factors of public participation in EGS value co-creation. Finally, "value co-creation" is still a new and foreign concept from marketing science, and according to demographic statistics, some of the respondents might be unfamiliar to the concept because they do not have a marketing background. Thus, respondents might not have accurately understood the relations between Internet efficiency, technology adopted, humanization design, and co-created value. Therefore, the personal experience on the EGS value co-creation might be a deviation, which could further influence the results of the survey.

## **Conclusion**

The new perspective of value creation makes the government better understand the demands of the public, and extend the EGS value creating span and channels. Public participation in EGS and in the EGS value co-creation becomes convenient and feasible, and conductible and valuable, especially with the development and adoption of social media, big data, artificial intelligence (AI) technology. The study adopted the combination of qualitative and quantitative research methods by taking the normative process of empirical study of the impact factors of the PEI on EGS value co-creation. A fourteen-factor HCFA structural model was constructed to describe the public engaging behaviors. This model could explain 77.13% of the variance in public engaging in the EGS value co-creation activities. Moreover, path analysis interpreted how the public would accept and adopt the EGS value co-creation platforms

and channels through some incentive mechanisms in government e-service operation. This study also introduced some management suggestions to help promote the effective implementation of the EGS and the wide distribution of value co-creation conception and activities. The results provided a comprehensive picture to understand the new paradigm of public service and administration in the era of an increasing dominance of users (the public).

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## Reference

- Adeleke, I. A., and AbdulRahman, A. 2011. "Co-creation of value: Applying the paradigm to government e-service," in *Proceedings of the 2011 International Conference on Research and Innovation in Information Systems*, Kuala Lumpur, Malaysia, pp. 1-6.
- Ahmed, A. M., Mehdi, Q. H., Moreton R., and Elmaghraby, A. 2015. "Serious games providing opportunities to empower citizen engagement and participation in e-government services," in *Proceedings of the 2015 Computer Games: AI, Animation, Mobile, Multimedia, Educational and Serious Games (CGAMES)*, Louisville, KY, USA, pp. 138-142.
- Bridge, C. 2012. "Citizen Centric Service in the Australian Department of Human Services: The Department's Experience in Engaging the Community in Co-design of Government Services Delivery and Developments in E-Government Services," *The Australian Journal of Public Administration* (71:2), pp. 167-177.
- Chen, Z., Vogel, D., and Wang, Z. 2016. "How to satisfy citizens? Using mobile government to reengineer fair government processes," *Decision Support Systems* (82), pp. 47-57.
- Christiansson, M. T., Axelsson, K., and Melin, U. 2015. "Inter-organizational public e-service development: Emerging lessons from an inside-out perspective," *Lecture Notes in Computer Science* (9248), pp. 183-196.
- CNNIC. 2017. "The 39th Statistical Survey Report on Internet Development in china," The Statistical Survey Report on Internet Development, China Internet Network Information Center.
- Diaz-Diaz, R., and Perez-Gonzalez, D. 2016. "Implementation of Social Media Concepts for e-Government: Case Study of a Social Media Tool for Value Co-Creation and Citizen Participation," *Journal of Organizational and User Computing*, (28:3), pp. 104-121
- Feller, J., Finnegan, P., and Nilsson, O. 2010. "Open innovation and public administration: transformational typologies and business model impacts," *European Journal of Information Systems* (20:3), pp. 358-374.
- Grönroos, C., and Voima, P. 2013. "Critical service logic: Making sense of value creation and value co-creation," *Journal of the Academy of Marketing Science* (41:2), pp. 133-150.
- Hu, G., Lin, H., Pan, W., and Wang, J. 2013. "Conceptualizing and Examining E-government Service Capability: A Review and Empirical Study," *Journal of the American Society for Information Science and Technology* (64:11), pp. 2379-2395.
- Hu, G., Pan, W., Lin, H., Kang, K., and Best, M. L. 2014. "Study on the Framework of e-Government Services Capability: An Empirical Investigation," *Social Science Computer Review* (32:1), pp. 56-73.
- Hu, G., Shi, J., Wen, P., and Wang, J. 2012. "A hierarchical model of e-government service capability: An empirical analysis," *Government Information Quarterly* (29:4), pp. 564-572.
- Linders, D. 2012. "From e-government to we-government: Defining a typology for citizen coproduction in the age of social media," *Government Information Quarterly*, (29:4), pp. 446-454.
- Liu, W., Xin, X., and Ren J. 2011. "Analysis of the Rising of Co-creation and Its Connotation," *Taxation and Economy* (6), pp. 28-32.

- Luna-Reyes, L. F., Picazo-Vela, S., Luna, D. E., and Gil-Garcia, J. R. 2016. "Creating public value through digital government: Lessons on inter-organizational collaboration and information technologies," In *Proceedings of the 49th annual Hawaii international conference on system sciences*, J. Tung, X. Bui, & R. H. Sprague (Eds.), Kauai, HI, USA, pp. 2840–2849.
- Nambisan, S., and Nambisan, P. 2013. "Engaging Citizens in Co-Creation in Public Services," *IBM Center for the Business of Government*.
- Olphert, C. W., and Damodaran, L. 2004. "Dialogue with Citizens-the Missing Link in Delivering e-Government?" *Systemics, Cybernetics and Informatics* (3:6), pp. 32-36.
- Osei-Frimpong, K., Wilson, A., and Lemke, F. 2018. "Patient co-creation activities in healthcare service delivery at the micro level: The influence of online access to healthcare information," *Technological Forecasting & Social Change* (126), pp. 14–27.
- Pan, W., Hu, G., and Ma, Y. 2016. "Human Factors and E-Government Service Capability: A Path Analysis," *Journal of Electronic Commerce in Organizations* (14:2), pp. 46-60.
- Prahalad, C. K., and Ramaswamy, V. 2004. "Co-creating unique value with customers," *Strategy & Leadership* (32:3), pp. 4-9.
- Subbiah, A., and Ibrahim, O. 2011. "Value Co-Creation Process: A Case of E-Service for G2C in Malaysia," *European Journal of Social Sciences* (19:3), pp. 443-449.
- Thomas, L. D. W., Autio, E., and Gann, D. M. 2014. "Architectural Leverage: Putting Platforms in Context," *Academy of Management Perspectives* (28:4), pp. 198-219.
- UNDESA. 2016. "E-Government in Support of Sustainable Development," The United Nations E-Government Survey 2016, The United Nation.
- Uppström, E., and Lönn, C.-M. 2017. "Explaining value co-creation and co-destruction in e-government using boundary object theory," *Government Information Quarterly* (34:3), pp. 406-420.
- Vargo, S. L., and Lusch, R. F. 2004. "Evolving to a New Dominant Logic for Marketing," *Journal of Marketing*, (68:1), pp. 1-17.
- Vartiainen, T., and Tuunanen, T. 2016. "Value co-creation and co-destruction in an IS artifact: Contradictions of geocaching," In *Proceedings of the 49th annual Hawaii international conference on system sciences*, J. Tung, X. Bui, & R. H. Sprague (Eds.), Kauai, HI, USA, pp. 1266–1275.
- Wang, Y. S., Hung, Y. H., and Chou, S. C. T. 2006. "Acceptance of E-Government Service: A Validation of the UTAUT," in *Proceedings of the 5<sup>th</sup> WSEAS International Conference on E-ACTIVITIES*, Venice, Italy, pp. 20-22.
- Xie K., Wu Y., Xiao J., and Hu Q. 2016. "Value co-creation between firms and customers: The role of big data-based cooperative assets," *Information & Management* (53:8), pp. 1034–1048.
- Xie, C., Bagozzi, R.P., and Troye, S.V. 2008. "Trying to Prosume: Toward a Theory of Consumers and Co-creators of Value," *Journal of the Academy of Marketing Science* (36:1), pp. 109-122.
- Zeithaml, V. A., Bitner, M. J., Faranda W. T., and Zeithaml, V. A. 1990. "Customer contributions and roles in service delivery," *International Journal of Service Industry Management* (8), pp. 193-205.
- Zhou, P., Ma, J., and Xu, X. 2012. "Empirical Study on Factors Influencing the Public Adoption of Mobile E-Government," *Library and Information Service* (56:5), pp. 134-138.