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The antecedent of citizen intention use of e-government service

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Abstract

The purpose of this study was to integrate citizen perceived value into an expectation-confirmation model (ECM) and to explain citizen intention use of e-government services. After reviewing both ECM and citizen perceived values, integrated models were designed. This study was compared to the basic ECM; this study revealed that the integration of ECM with citizen perceived value can provide a concerted solution to illustrate some factors and how it can influence citizen intention use for e-government services.

Keywords*: citizen intention use, e-government service, expectation-confirmation model, perceived value*

1. Introduction

Information communication technology (ICT) has been utilized as a instrument that can increase control and transparency, to connect people, society and community that generate information. ICT is higly expected at some cities as it will increase the openness, transparency and accountability of public administrations; thereby it is increasing the interest and involvement of citizens in politics, and leading them close to the government. E-government,thus, is seen as a positive way for increasing trust in government [1], providing space for citizen in the information age to interact with government, involving stakeholders in new ways to suffice public challenges and to increase government accountability in comprehensive mean [2-4].

Expectation confirmation model (ECM), first developed by [5] which is used to understand and predict user intention to information technology and information system. Nowadays, many studies have used ECM as the main framework [6]. However, few studies combined e-government with personality-based and cognitive-based antecedents to understand Citizen behavior of intended use of e-government services.

Due to the rapid increase of information technology and information systems especially in e-government services, citizen perceived value becomes very important to be understood in the area of e-government service [7, 8]. The impact of citizen perceived value must be clearly understood and emphasized in order to determine the user's preferences and perceptions concretely [9]. Therefore, this study uses citizen perceived value as an preceding of psychological merits to explain the cognitive standard of ECM, while e-government is used as a case study to elaborate the factors that influence antecedent citizen intention use. In this study we integrate citizen perceived value with ECM which makes this study different from previous studies. This study investigates the effects of citizen perceived value, citizen confirmation expectation, citizen perceived usefulness, citizen satisfaction and citizen intention use. Based on the concept of citizen perceived value and ECM we propose, this research seeks to develop and integrate new framework to assess and forecast citizen intention use for e-government services.

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2. Literature Review

2.1. ECM and Citizen Continuance Use of E-government

ECM is first introduced by [10] based on expectation-confirmation theory (ECT) while ECT is constructed and introduced first by [11]. ECM reduces the concept of ECT. The three dimensions adopted from the ECT are used to achieve user intention in the field of information technology, namely perceived usefulness, expectation confirmation and satisfaction. Prove that the main disparity between ECT and ECM is that ECM is used to examine post-acceptance related Constructs, whereas ECT describes on pre-consumption and post-consumption factors [2]. In addition, ECM is also used to assess the effects of post-consumption and pre-consumption expectations. The ECM theory adds the concept of perceived usefulness. According to ECM theory, the users will have the intention of continuing to use IT/IS after feeling fulfilled expectation in the experience of using IT/IS [12].

Many methods and theories have been used regarding the intention use of IT/IS adoption, such as technology acceptance model (TAM), theory of planned behavior by [13] and unified theory of acceptance and use of technology by [14] but these theories cannot yet explain the concrete sustainability of the use of IT/IS [5]. The services that exist in the government if performed properly will result in perceived usefulness and expectation confirmation are supposed to have a determinate will give impact on user satisfaction of e-government. The purpose of the ECM is to explain how a person's intention process to experience the IT/IS agility especially in e-government. Therefore, this study provides how this research extends ECM by concentrating on citizen activity because this aspect is very important in e-government readiness and sustainability.

2.2. Perceived Value

Many previous researchers agree that perceived value (PV) can be used as a metric indicator. PV is widely used in several marketing studies [15]. Customer intention use can be keen by checking PV. The results from PV can be expanded into key divergence to maintain a competitive advantage [16]. The importance of PV is very principal on the value of the output or distinction perceived by the customer [17], which can be asserted as a sell off between the perceived benefits of the customer and the costs incurred [18]. In a mobile commerce study [19], it indicates that PV is a metric used by customers to measure the effectiveness of all existing services, using their benefits to gain the benefits they can feel.

The value of the product or service, conducted by the vendor to its consumers is known as input value [20]. Input value is a personal perception or assessment, derived from the interaction and adoption process of social interaction, exchange, or expenditure. In other words, the value of consumption is basically a belief to obtain perceived value or can also be interpreted that the value of consumption is the highest perceived value [21].

Explains that PV is built on five theoretical types: functional value, emotional value, social value, epistemic value, and conditional value [22]. The basic concept of PV is to measure the psychological influence and value of a person, not only in the product and the possession of a particular product or service, but also from the consumer itself [23].

3. Research Hypotheses

Technology readiness, perceived value, optimism, and innovation in IT/IS can provide incentives for citizens to use e-government on an ongoing basis. However, there are often two barriers, namely discomfort and insecurity which make citizens reluctant to adopt e-government. Since the role of information distribution is very significant in e-government, it is urgent to investigate the role of citizen perceived value. Has developed and assessed the integration of perceived value with the technological acceptance model, in which the study shows that perceived value is significantly related to perception of usefulness and behavioral intent in the context of electronic services [9]. Related to previous studies have shown a positive correlation between perceived value and satisfaction [21-24]. Based on the literature review, this study proposes three hypotheses:

H1 : Citizen perceived value positively affects citizen expectation confirmation of e-government service.

H2 : Citizen perceived value positively affects citizen perceived usefulness of e-government service.
H3 : Citizen perceived value positively affects citizen satisfaction of e-government service.

This study defines satisfaction in the context of e-government services as a psychological state resulting from an assessment of what is perceived between expectations and reality. Describes in the ubiquitous context that user satisfaction has dependence on user confirmation [25]. Similar studies reveal that confirmation positively impacts satisfaction. The ECM study explains that perceived usefulness has a positive correlation and value to confirmation [15], [26], [27]. In satisfaction cases and in the context of e-government shows that satisfaction is positively influenced by confirmation. Thus, the following hypothesis is proposed [2].

H4 : Citizen expectation confirmation positively affects citizen satisfaction of e-government service.
H5 : Citizen expectation confirmation positively affects citizen perceived usefulness of e-government service users.

Citizen satisfaction is the principle of success in the implementation of e-government service. Under the ECM model, intention use is influenced by satisfaction. Related studies on IT/IS agree that the user's continuity intentions are primarily determined by their satisfaction with prior use. Thus, the following hypothesis is proposed.
H6: Citizen satisfaction positively affects citizen continuance intention of e-government service.

Describes perceived usefulness as an important determinative of the use of systems especially in an online learning system study [28], empirically tested the online learning context that both satisfaction and intention use were influenced by perceived usefulness [29]. In addition [30] explains that perceived usefulness has a positive correlation between satisfaction and intention use in the context of sustainable social relationship. Likewise, previous studies have constantly shown that perceived value is the determinant indicator for user satisfaction and user intention use [18], [31]. Thus, we propose the following hypothesis.

H7 : Citizen perceived usefulness positively affects citizen continuance intention of e-government service.
H8 : Citizen perceived usefulness positively affects citizen satisfaction of e-government service.

In short, we connect citizen perceived value with citizen perceived usefulness in e-government services and citizen intention use. The constructs we develop in this mediator are citizen confirmation, citizen perceived usefulness and citizen satisfaction, and this construct plays the role of an explanatory variable for understanding the effects indirectly. That is, we build relationships between key predictors of citizen perceived value and outcome variables such as citizen satisfaction and citizen intention use for e-government services. Figure 1 illustrate all of the hypotheses and research framework.

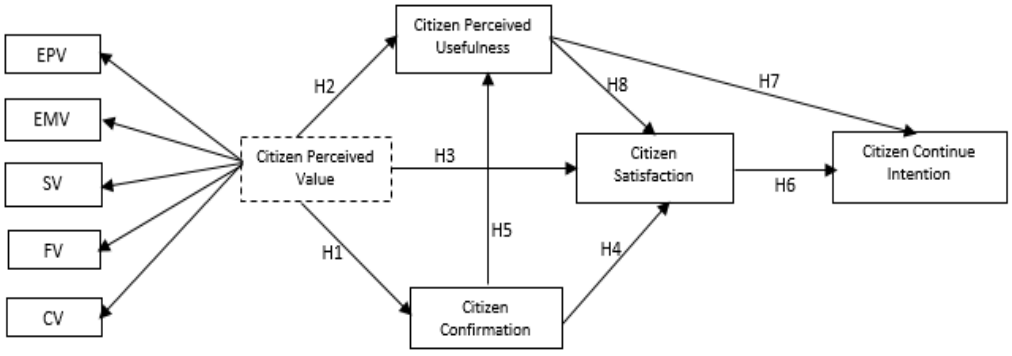


Figure 1. Hypotheses and research framework

4. Methods

The compositive implications of ECM and citizen perceived value are assessed by conducting online surveys of the user experience of e-government services in Indonesia and Taiwan. We use the online survey method because it has several advantages over paper-based data collection: the benefit of online investigation including rapid response, low cost, and no geographic limitations [32].

To ascertain that participants did not fill out the questionnaire more than once, each participant was asked to provide an e-mail. After eliminating invalid responses, collected data with valid and final sampling is 371 subjects. Table 1 presents sample demographic data. Measurement items are taken based on the aims of the previously mentioned research, through the research framework, as well as the relevant literature. The questionnaire is discussed with scholars who have expertise in e-government, as well as practitioners and have been corrected several times following the pretest method. To formulate measurement items, this study refers to credible references. The questionnaire survey period is from 08 January 2018 to 30 March 2018.

Table 1. Sample Profile

Variables		Number	Percentage
Gender	Female	165	44.5
	Male	206	55.5
Age	18–29 years	82	22.1
	30–39 years	92	24.8
	40–49 years	95	25.6
	50–59 years	62	16.7
	>60 years	40	10.8
Education level	Primary	32	8.6
	Secondary	79	21.3
	Diploma	103	27.8
	Degree	90	24.2
	Post graduate	67	18.1
Sector of employment	Public sector	195	52.6
	Private sector	176	47.4

5. Results

In this study we use partial least squares (PLS) to test and verify the model hypothesis and test stability. In the process of analyzing data, the software used is Smart PLS version 2.0. PLS is a structural equation model (SEM) technique based on path analysis and regression analysis. PLS is used as a technique in analyzing models that have a mutual interaction with the number of constructs.

In this study, PLS is utilized here as a manner of analysis because of some factors. First, it is used to integrate citizen perceived value and its antecedents. A number of constructions are built on this framework, such as citizen usefulness, citizen expectation, and citizen satisfaction. Second, citizen perceived value in this research is second order reflective construct. On the other hand, PLS does not test the significance, then the resampling procedure is used for significance testing. In this concept, in this study to measure the significance of using the bootstrapping method, repeated measurements are made using random samples. An appropriate simulation result is then utilized to calculate statistical and testing evaluations. Based on suggestions proposed by [33], the number of re-samples is set at 1000 to reach constant parameter estimates.

5.1. Outer Model

We measure the interaction between latent construct and indicator on PLS which is known as outer model. Indicator used in outer model is loading factor and reliability test result value from various construction items. In addition, Cronbach's α value and composite reliability values are measured. In order to be declared reliable and acceptable, then the value must be worth 0.7 or greater. Table 2 displays that the existing constructs have met the criteria and can be considered acceptably reliable.

Two tests were conducted in this study to validate construct validity, namely: test convergent validity and test discriminant validity. Suggest that the construct shows convergent

validity if the indicator of the loading factor is higher than 0.5, the average variance extracted (AVE) is higher than 0.5, and the reliability is higher than 0.7 [34]. Table 3 shows that all constructions are in accordance with the suggestions proposed by [32], which means convergent validity is appropriate. To test discriminant validity, then we used the square root indicator of AVE that is if the square root of EVA is bigger than construct correlation coefficient tested, it can be declared and can be confirmed that it has fulfilled discriminant validity. Based on Table 3 and Table 4, the construct shows that it meets the standard of convergent validity and discriminant validity.

Table 2. Reliability Analysis and Convergent Validity

Construct	Measurement items	Factor loading/coefficient (t-value)	Composite reliability	AVE	Cronbach's α
Citizen intention use (CIU)	CIU1	0.79	0.80	0.72	0.89
	CIU2	0.86			
	CIU3	0.87			
Citizen satisfaction (CSAT)	CSAT1	0.80	0.89	0.74	0.82
	CSAT2	0.88			
	CSAT3	0.88			
Citizen expectations confirmation (CEF)	CEF1	0.82	0.887	0.68	0.77
	CEF2	0.82			
	CEF3	0.83			
Citizen perceived usefulness (CPU)	CPU1	0.79	0.88	0.70	0.79
	CPU2	0.85			
	CPU3	0.86			
Epistemic value (EPV)	EPV1	0.85	0.84	0.73	0.63
	EPV2	0.85			
Emotional value (EMV)	EMV1	0.86	0.86	0.75	0.67
	EMV2	0.86			
Social value (SV)	SV1	0.85	0.84	0.72	0.61
	SV2	0.83			
Functional value (FV)	FV1	0.85	0.83	0.71	0.59
	FV2	0.82			
Conditional value (CV)	CV1	0.90	0.85	0.74	0.65
	CV2	0.80			

Table 3. Correlation Matrix

	CEF	CIU	CPU	CSAT
CEF	0.82			
CIU	0.79	0.85		
CPU	0.77	0.72	0.84	
CSAT	0.72	0.75	0.82	0.86

Note: Citizen perceived usefulness (CPU); Citizen expectations confirmation (CEF); Citizen satisfaction (CSAT); Citizen intention use (CIU).

Table 4. Summary of hypotheses testing results

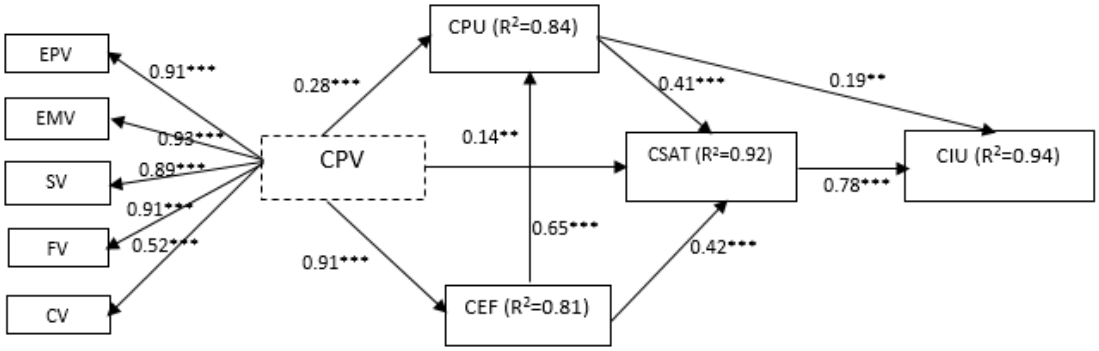
Hypothesis	Path	Standardized path coefficient	t-value	Supported
H1	CPV-CEF	0.91***	92.77	Yes
H2	CPV-CPU	0.28***	4.37	Yes
H3	CPV-CSAT	0.14**	2.52	Yes
H4	CEF-CSAT	0.42***	5.69	Yes
H5	CEF-CPU	0.65***	10.54	Yes
H6	CSAT-CIU	0.78***	8.69	Yes
H7	CPU-CIU	0.19**	2.22	Yes
H8	CPU-CSAT	0.41***	4.82	Yes

Note 1: Citizen Perceived Value (CPV); Citizen perceived usefulness (CPU); Citizen expectations confirmation (CEF); Citizen satisfaction (CSAT); Citizen intention use (CIU).
Note 2: **p-value < 0.01; ***p-value < 0.001

5.2. Inner model

PLS concept is known as inner model that is structures path between constructions. The t-value coefficient, significance, and hypothesis test results for the model in this study can

be seen in Table 4 and they are illustrated also in Figure 2. All hypotheses formulated in research are positive and significant.



Note 1: Citizen Perceived Value (CPV); Citizen perceived usefulness (CPU); Citizen expectations confirmation (CEF); Citizen satisfaction (CSAT); Citizen intention use (CIU); Functional value (FV); Social value (SV); Emotional value (EMV); Epistemic value (EPV); Conditional value(CV).

Figure 2. Inner model and path coefficient

5.3. Testing of mediation effects

The Sobel test is utilized to analyze the effects of mediation. Significance is achieved when the z value is higher than 1.96, to indicate the effect of mediation [18], [35]. All existing constructs showed the value of the mediation effect. Test results can be seen in Table 5.

Table 5. Mediation Effects Testing

Constructs	Construct relationships	T-value of path coefficients	Sobel test's z-value
CPV-CPU-CIU	CPV-CPU CPU-CIU	4.37 2.22	1.97*
CPV-CPU-CSAT	CPV-CPU CPU-CSAT	4.37 4.82	3.23**
CPV-CSAT-CIU	CPV-CSAT CSAT-CIU	2.52 8.69	2.42*
CPV-CEF-CPU	CPV-CEF CEF-CPU	92.77 10.54	10.47***
CPV-CEF-CSAT	CPV-CEF CEF-CSAT	92.77 5.69	5.67***
CEF-CPU-CIU	CEF-CPU CPU-CIU	10.54 2.22	2.17*
CEF-CPU-CSAT	CEF-CPU CPU-CSAT	10.54 4.82	4.38***
CEF-CSAT-CIU	CEF-CSAT CSAT-CIU	5.69 8.69	4.76***
CPU-CSAT-CIU	CPU-CSAT CSAT-CIU	4.82 8.69	4.21***

Note 1: Citizen Perceived Value (CPV); Citizen perceived usefulness (CPU); Citizen expectations confirmation (CEF); Citizen satisfaction (CSAT); Citizen intention use (CIU).
Note 2: *p-value < 0.01; **p-value < 0.001; ***p-value < 0.0001

6. Implications

The findings of this study have several managerial implications. First, citizen perceived value is significantly related to citizen intention use in e-government services through mediator citizen perceived usefulness, citizen satisfaction and citizen expectation confirmation. Psychologically, citizens who adopt e-government services are strongly influenced by perceived experience, and that perception affects the psychological perceptions of citizens who adopt services rather than e-government. The findings of this study indicate that integrating the

psychological perception of citizen perceived value into ECM improves accuracy in the assessment of models that have been built to predict citizen intention use.

Secondly, citizen perceived value, citizen perceived usefulness, and citizen expectation confirmations positively influence the intention to use e-government services through the mediation effect of citizen satisfaction while some empirical studies have eliminated the role of satisfaction in predicting usability [24], [33], [35] this study shows that the effect is significant. Given the mediation test results and the relevance of satisfaction as an important mediator in ECM and has a role as a predictor in various studies on behavior in adopting IT/IS, we advise not to eliminate the satisfaction of behavioral studies that in adopting IT/IS.

Third, Based on post-adoption experience, citizen expectation at the beginning of its use may change. Citizen expectation should always be updated simultaneously which in turn can have an important influence on the perceived use of citizen and citizen satisfaction. In addition, citizen perceived usefulness is a dominant factor in influencing citizen satisfaction and citizen intention use in e-government services. So these findings can be used to enhance the competitive advantage of service providers and to help understand the values of users of e-government services.

7. Conclusions and Future Work

The contribution of this research is to develop and integrate ECM with the citizen perceived value and synthesize the essence to explain the intention of citizen use in e-government services by measuring the factors that influence it systemically. Referring to the theories of previous studies and the characteristics of the service in e-government, this study integrates the citizen perceived value to the ECM to be adopted for e-government services, and theoretically we connect that the impact of the citizen perceived value to the citizen intention use mediated by citizen perceived usefulness, citizen expectation confirmation and citizen satisfaction.

We used empirical approach for the method and had explained that the citizen perceived usefulness, citizen expectation confirmation and citizen satisfaction is a strong indicator in predicting citizen intention use on the scope of e-government services. Limitations to this study should be addressed by similar studies in the future. Namely, the data used from the integration of ECM and citizen perceived value is limited in two countries, namely Indonesia and Taiwan, it would be better if later added from different countries.

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