

BUILDING CITIZEN-CENTRIC GOVERNMENT THROUGH E-GOVERNMENT INITIATIVE: TAIWAN E-GOVERNMENT

Vinda Daningrum¹⁾, Sun-Jen Huang²⁾

¹Information Management, School of Management, National Taiwan University of Science and Technology (NTUST)
No. 43, Sec. 4, Keelung Rd. Da'an Dist., Taipei City, Taiwan, 10607
E-mail: M10309819@mail.ntust.edu.tw¹⁾

Abstract

E-government is conceived as the enabler of citizen-centric government, which is stressed on 'putting citizens first'. Considers e-government as the manifestation of IT investment, prior research stated IT investment could not directly improve performance, yet it need to be strategically transformed within business proses. Three proposed presumed determinants that affect the success of citizen-centric government performance: 1) e-government quality; 2) open data; 3) citizens' participation. Thus this study aims to identify the influence of those three towards citizen-centric government performance. Online and offline survey of Taipei citizens were conducted and analyzed using SEM. Finally this study revealed the positive significant direct influence of citizens' participation towards citizen-centric government performance. Since open data also has significant relationship with citizens' participation, it indirectly influences citizen-centric government performance through citizens' participation. Unfortunately, the relationship between e-government quality and citizen-centric government performance as well as e-government quality and citizens' participation were not significant.

Abstrak

E-government dipercaya sebagai pendorong tercapainya pemerintahan berorientasi rakyat, yakni berfokus pada "memprioritaskan rakyat". Memandang implementasi e-government sebagai salah satu bentuk investasi Teknologi Informasi (TI), penelitian terdahulu menyatakan investasi TI tidak dapat meningkatkan kinerja secara langsung, melainkan perlu ditransformasikan secara startegis ke dalam proses bisnis. Diusulkan tiga dugaan faktor penentu yang mempengaruhi kesuksesan kinerja pemerintahan berorientasi rakyat: 1) kualitas e-government; 2) open data; 3) partisipasi rakyat. Penelitian ini bermaksud mengidentifikasi pengaruh partisipasi rakyat, kualitas e-government, dan open data terhadap kinerja pemerintahan berorientasi rakyat. Survei online dan offline dilakukan terhadap warga Taipei dan dianalisis menggunakan SEM. Penelitian ini mengungkapkan pengaruh positif signifikan secara langsung dari partisipasi raykat terhadap kinerja pemerintahan berorientasi rakyat. Dikarenakan open data juga memiliki hubungan positif dan signifikan dengan partisipasi rakyat, maka ia secara tidak langsung mempengaruhi kinerja pemerintahan berorientasi rakyat melalui partisipasi rakyat. Namun hubungan antara kualitas e-government dengan kinerja pemerintahan berorientasi rakyat, serta partisipasi rakyat tidaklah signifikan.

Kata kunci: e-government, open data, partisipasi rakyat, pemerintah, pemerintahan berorientasi rakyat

1. INTRODUCTION

The growth of e-government implementation around the world has been rapidly increasing. According to United Nations, by 2003 over 173 countries had developed government web-sites [1]. United Nations then reported there were 193 member states in 2014 included in the e-government survey [2]. The progress was significant as among 193 member states, there were 18 countries that previously remain offline in 2003 and 3 countries in 2012. In spite of an only

slight growth, the usage of emails in national portal also increased from 63% in 2012 to 68.4% in 2014. Progress has also occurred in the usage of Short Messaging Service (SMS) for public service delivery. The usage of SMS increased from 14% in 2008 to 32% in 2014. As for U.S. government, approximately 10% of their IT budget in 2011 was spent on e-government initiatives [3].

Apart of different meanings, e-government is conceived as the enabler of various government objectives towards different stakeholders. Among all, this study focuses on

citizen as the critical stakeholder of government. In spite of high efficiency, public value delivery, sustainable related issues, and other economic as well as non-economic benefits, those promising potentials of e-government for citizens could be summed up into one particular purpose namely citizen-centric government. Citizen-centric could be defined as a government model that has been transformed either from bureaucracy-centric [4] or agency-centric [5].

Considering the disadvantages of ICT investment that has been maturely discussed as 'IT productivity paradox' since the late 1980s and early 1990, there were evidences that ICT investment will not produce anything unless they are mediated by some variables. They must be combined with complementary assets, leveraged to build capabilities, and used to support organizational competencies [6]. As for e-government, that statement is also valid [7]. Hence, the supporter variables of e-government initiative and government's objectives need to be investigated, so that government will have a clear vision of what improvement need to be prioritized during e-government initiative development and implementation. Focusing on being citizen-centric as the main goal, this study aims to identify the key determinants that potentially related to the success of e-government initiative in transforming the government model into citizen-centric.

As the citizen-centric government became the main goal, the need of transparency is growing. Settling citizens' needs as the highest priority means that the voices of government and citizens should flow both ways. To be heard by the citizens, government indeed needs to communicate the valuable information to the citizens without taking any secrecy. Not only connecting the citizens, government also required to be more open, since an improved transparency is the characteristics of good governance [8]. The connected citizens should be facilitated by the accessibility to information of public value and transparency of government operations [9]. Thus, the notion of open data emerged in 2009 as the Memorandum on Transparency and Open Government issued by Barack Obama [10]. Prior to the memorandum, data were described in The 2009 Digital Britain Report as *'new currency for the digital world and the lifeblood of the knowledge economy'* [11]. Opening governmental data will reduce the dearth of citizens' roles within governmental decision making process. As a consequence, the citizen-centric government embodiment will be far more possible [12]. Nevertheless, there is slight evidence of direct impact of open data towards citizen-centric government

performance. For that reason, this study will seek the clarity whether open data are linearly correlated with the improvement of citizen-centric government performance, also looking for the possible key determinant that mediating those two concepts.

Retrace to the need of two-ways communication between government and citizens, the active involvement of citizens is critical to build citizen-centric government. Noting that a purely operational or transactional of government could be driven into government where the key performance indicators rely on level of transparency, accountability, and participation (Calista & Melitsky, 2007; Marche & McNiven, 2003), government need to be responsive toward changes and citizens demands [13]. Therefore, a great volition to involve citizens within decision making process and willingness to consider citizens' voice are vital requirements [9]. Citizen is one of most important and decisive complimentary that helps e-government initiative meets e-government's goals [7]. The investment of e-government initiative should be extensively adopted by citizens in order to capture the maximize benefits of e-government services. Unfortunately there is a gap between the provided services and the usage. As reported in Europe, in 2012, the index of provided services was 75%, but the index of usage was only below 30% [14]. According to earlier statistical data in 2009, there is also no significant correlation between level of e-government's services and the level of usage [15]. Therefore, this study intends to identify if citizens' participation on e-government initiatives help the government to achieve citizen-centric performance.

2. RESEARCH MODEL AND HYPOTHESIS

This section provides the development of hypothesis and research model. This section also illuminates the variables, indicators for each variable, and measure items for each indicator together with the operational definition.

2.1 E-Government, Citizens, and Citizen-Centric Government

The government-oriented paradigm could be moved into citizen-centric paradigm by the help of ICT [16]. However, the website or any digital interface by itself would not be enough to create significant changes [17]. Therefore, the reorganization and reinvention will be necessary to emanate the benefit of e-government initiative instead of hoping it to come directly

from the usage of ICT (De', 2008; Ask & Grönlund, 2008). To achieve balanced e-government, strengthening participatory elements is crucial [18]. Also, as the consequence of ICT improvement, citizens then enforce the government to create a system which enables the participation of citizens within policy making process [16]. Moreover, when e-government successfully improve government services and business process, it will naturally need the enhancement of citizens' participation roles and reduces the roles of states [19]. Savodelli et al. (2014) stated that to improve citizens' satisfaction, e-government should provide high quality of services. That is why, assessing e-government quality is essential.

The importance of citizens participation arose when government usually believe that they had successfully improve their services to be more efficient, transparent, and accountable by implementing e-government initiatives. However, citizens and the other stakeholders think differently against government's real achievement [20]. Furthermore, refers back to the concept of citizen-centric government, in which the participation of citizens is the main idea. According to Andrews and Shah [21], government needs to provide tools for the citizens to: 1) give their demand as the input of government services initiative; 2) allow the citizens to evaluate government and civil servants performance. Thus, in this digital era, e-government could be the solution of such problem.

Due to those circumstances, whether e-government initiative quality will directly improve government performance, in creating citizen-centric government in particular, has begun to be questionable. It is important to determine whether e-government initiative has already met the quality that is desired by the citizens. Moreover, it is also important to notice the contribution of citizens' participation towards the improvement of e-government quality so that e-government initiative could finally help the government to achieve citizen-centric government goals. Therefore, to answer the debate, hypothesis 1, 3, and 4 are proposed as follows:

Hypothesis 1: There is Significant Relationship between E-Government Quality and Citizens' Participation.

Hypothesis 3: There is Significant Relationship between Citizens' Participation and Citizen-Centric Government Performance.

Hypothesis 4: There is Significant Relationship between E-Government Quality and Citizen-Centric Government Performance.

2.2 Open Data, Citizens, and Citizen-Centric Government Performance

E-government is initiated to improve administration efficiency [22], quality of services, and openness [23]. The advancement of ICT triggered citizens to eagerly ask their government to open more information and escalate its transparency [16]. In 2009, the idea of open data (open government data) emerged to overcome the need of transparency, participation, and collaboration in government [24]. The principle of open data is opening public sector information data, government processes and operations, and engaging citizens in decision making [25]. The first initiative was announced by American government and then some other government followed, such as Australian Government [26]. According to the Australian Government 2.0 Taskforce report, the key principles of openness and transparency in government are informing, engaging, and participating. Moreover, refer back to citizen-centric government principle that government openness is highly required. Therefore, both open data and citizens' participation are related each other. To define, the relationship among them and the contribution of both open data and citizens' participation towards citizen-centric performance, hypothesis 2, 3, and 5 are proposed as follows:

Hypothesis 2: There is Significant Relationship between Open Data and Citizens' Participation.

Hypothesis 3: There is Significant Relationship between Citizens' Participation and Citizen-Centric Government Performance.

Hypothesis 5: There is Significant Relationship between Open Data and Citizen-Centric Government Performance.

2.3 Proposed Research Model

Based on the hypothesis development, this study proposes research model as depicted in Figure 1 below.

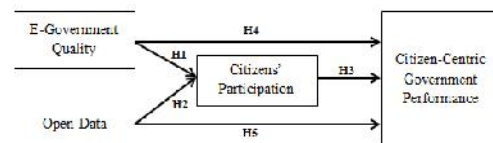


Figure 5 Proposed Research Model

This study utilizes first order variable assumption. Thus each variable has its own indicators and each indicator has several measure items (see Appendix). Measures item and indicators are derived from the previous research. Systems Quality, Information Quality,

and Service Quality are adapted from DeLone and McLean [27] IS Success model. Systems quality measures the success of e – government from the technical point of view, in which explains the level of accuracy and efficiency of government as the information provider through the use of ICT. Information quality measures the success of e – government from the semantic point of view, in which assesses the effectiveness of information provided by e – government systems to deliver the intended meaning. Information quality also examines the content of information provided by e – government systems. Service quality measures the success of e – government as a whole, regardless the particular institution that involved in the service delivering process. The indicator of open data which is openness and transparency are derived from Veljković, et al, [24]. Openness measures the openness of data that are shared by the government. Meanwhile transparency refers to the transparency level of data that are provided by e – government.

The indicators of citizens' participation were developed based on United Nation's E-Participation Index that electronic based participation represents a process of citizens engagement within governmental decision making and policy to achieve 'participatory, inclusive, collaborative, and deliberative public administration' [2]. E-Information aims to reduce the knowledge diversity among citizens regardless their segments of society and area of living. E-Information should make it possible for all citizens without exception to be able to access all critical and valuable information from the government. Thus, the information should be powerful enough so that citizen will be engaged within public policy. E-Consultation represents an effective communication between citizens and government. Moreover, the government also needs to provide any media and tools so that citizens will be able to give their opinion, feedback, and comment regarding particular information. Likewise, the citizens also must be actively involved in the consultation process and willing to utilize the media and tools that have been provided by the government. E-Decision making focuses on creating public policy that directly involves citizens input. The processes are more likely same with e-consultation but focuses more on public policy construction and enforcement. As for indicators of citizen-centric government are mostly constructed based on Andrews and Shah [21] and A.T. Kearney [13]

3. RESEARCH METHOD

This study uses post-positivist approach because it is more for quantitative research than

qualitative. Moreover, this study meets the scientific principles include empirical, objective, measurable, rational, and systematic. This approach also called as scientific method or empirical science. This study involves the assessment of causes that influence particular outcomes (hypothesis), data, and theory testing. This study outrights the norm of explanatory research because this study explains the effects between variables through model testing. This study also uses experimental design which is survey research that provides the attitude and opinion of population through the sample. This study has the nature of confirmatory because this study aims to confirm the effect of citizens' participation, e-government quality, and open data towards citizen-centric government performance.

This study held in Taiwan, particularly Taipei. This study will use minimum of 100 citizens of Taipei who have the experience of using Taiwan e-government system and accessing Taiwan open government data. As suggested by Wolf, et al, [28] the sample size ranging from 30 up to 450 are acceptable for SEM and 50-70 would be enough for model involving 4 latent variables [29].

To test the proposed model, this study took a survey that been conducted in Taiwan. Therefore, having an adequate understanding of Taiwan e-government is essential. Taiwan has been rewarded for several achievements regarding its e-government initiative. According to global e-government survey held by Brown University of United States, Taiwan gained first place for three times during 2001-2008. Rapid development of Taiwan's ICT industry has successfully raised the readiness of electronic network development in Taiwan. This readiness helped internet penetration to get its popularity. Based on world rank in 2007, some of Taiwan's successful ICT industries are the TFT-LCD industry in which achieved the first place and semiconductor industry that achieved the fourth place. According to Internet World Stats, Taiwan had 15.4 million internet users in 2008, with penetration rate around 67.4%, and 71.8% in 2009. Based on that capability, Taiwan is beyond ready to establish e-government initiative. Choosing Taiwan as the object of study also considered as a wise idea since Taiwan e-government is sufficiently enhanced and mature.

According to Taiwan E-Governance Research Centre [30], Taiwan has been conducting e-government program since 1998. There are 4 phases of e-government in Taiwan. The 1st phase was the e-government implementation plan phase. This phase was conducted during 1998-2000 to achieve internet

penetration by developing basic information and communications environment. The 2nd phase was the e-government action plan. This phase, which held during 2003-2004, was performed by providing universal online services. The next phase is 2.5th phase (2003-2007). The main goal was to create e-Taiwan with integrated and interactive service. The 3rd phase (2008-2011) was to achieve U-Taiwan by performing e-government program to support e-governance and on-demand e-service. Currently, Taiwan e-government is in the 4th phase (2012-2016), which is creating Intelligent Taiwan is the main purpose. To achieve that purpose, Taiwan e-government has been using web 2.0 technology so that Taiwan e-government could provide focused, proactive, grassroots, and sustainable service. As for infrastructure development, Taiwan e-government is currently supported by portable devices, wireless broadband network, and web 2.0 applications. The main services of Taiwan e-government 4th phase are government cloud application services, expansion of core databases, proactive one-stop service, e-services to the home, integrated social networking, and mobile e-government. All of those services criteria had been included in this study and were represented by e-government quality variable.

Taiwan e-government is developed as the strategy to achieve better e-governance. Thus, Taiwan e-government is expected to improve government effectiveness. In order to overcome such objective, Taiwan e-government promotes 3 domains: 1) e-service; 2) e-administration; 3) e-participation. E-service is built for better transparency by performing information integration and a single portal principle. To measure the success of e-service, integration and single portal have been included in e-government quality variable, while transparency has been included in open data variable. The second domain is e-administration which is performed to gain better accountability by performance evaluation and information disclosure. The assessment of e-administration also has been included in open data variable. The last domain is e-participation. This domain is performed to gain better policy making by listening to the public, policy disclosure, and public participation. In this study, the success of e-participation domain has clearly assessed by citizens' participation variable.

Structure Equation Model (SEM) is used in this study. SEM is a comprehensive statistical approach to test hypothesis regarding the relationship between observed variables and latent variables [31]. SEM is used as the methodology to represent, estimate and test a theoretical network of linear relationships between variables. SEM tests the hypothesis

patterns of direct and indirect relationships between a set of observed variables and unobserved variables. The purpose of SEM is to understand the patterns of correlation/covariance between a numbers of variables and explain all of the possible variances on a model [32].

4. RESULT AND ANALYSIS

This section explains the result of data processing within this study. It consist of data collection process, respondent demographics, descriptive statistics, validity test result, reliability test result, linearity test result, measurement model analysis, hypothesis testing result, and variability of variables.

4.1 Data Collection and Demographics

Data were collected during winter season by spreading the questionnaire survey in Taipei. The survey was conducted both online and offline. Both online and offline survey were written in Chinese character so that it will be easier for any Taipei citizens to fill the survey. The offline survey was conducted at NTUST (National Taiwan University of Science and Technology) neighborhood. As for inside NTUST campus, the survey was conducted at MBA program classes, Information Management classes, Information Department Office, Office of International Affair, Office of Graduate Studies, Office of General Services, Office of Student Affair, Language Center, Electrical Engineering Office, and School Clinic. Meanwhile, the outside venues of survey were JuSoft Co., Software House Company (the name of company is confidential), Hua Nan Bank, and Chemical Industry (the name of company is confidential). There were 169 of spread offline questionnaires, but only 99 were returned and 98 are valid. Besides, there were 44 respondents of online survey and all are valid. Finally, there are 142 data in total that been used in this study. As suggested by Wolf, et al, [28] the sample size ranging from 30 up to 450 are acceptable for SEM and 50-70 would be enough for model involving 4 latent variables [29].

There are 7 of introductory questions offered in the first section of the questionnaire. Those questions are offered to gain better understanding of respondents' characteristic. Among them, there are 4 open questions and 3 closed questions. The open questions consist of occupation, age, highest education level, and working seniority/ experiences. The closed questions are gender, e-government usage frequency, and open data usage frequency.

However, there are plenty of respondents who were not filled their education level (around 50%) and their working experiences (around 60%). Therefore, those two questions will not be included in this analysis. As a replacement, the estimation of level of education and working experiences would be covered by occupation data. As depicted in Table 1, students dominate the distribution of respondents (36.6%) and followed by education sector as the second majority of respondent's occupation (28.16%). This distribution satisfied the requirement of this study, in which the respondents are well educated so that the misinterpretation of measurement items (in the questionnaire) could be minimized. Moreover, the respondents of this study were coming from IT business, engineer, health sector, banking, and broadcasting industry with the total number of each are almost the same. The respondents from those areas are already 'employee' so that they must have working experience (even if it is not at the senior level) and they must have taken an adequate education so that they could be accepted in such industry. Hence, the need of education level and work experience for this study have been satisfied.

Table 1 Respondent's Occupation Recap

Occupation	Total	Percentage
Student	52	36.6
Education sector	40	28.16
IT business	12	8.45
Engineer	10	7.04
Health sector	10	7.04
Banking	10	7.04
Broadcasting	8	5.63
TOTAL	142	100

In terms of age (see Table 2), the majority of respondents are the youth (<30 year old). Thus the level of awareness of recent technology is satisfied. The second majority are people with productive age (36-40) who probably have adequate work experiences and experiences with government services and policy such as paying taxes, electing, do some procurements, and so on. This study also gathered quite enough amount of the very senior age (46-50) who probably knew exactly and have the capacity of evaluating government performance. As for gender (see Table 3), the proportion of female and male is balanced. It is almost 50:50. This situation is beneficial for this study because gender factor gap such as the level of acceptance towards new technology would be spared.

Table 2 Respondent's Age Recap

Age	Total	Percentage
-----	-------	------------

Age	Total	Percentage
<30	78	54.9
30-35	18	12.67
36-40	23	16.19
41-45	9	6.33
46-50	11	7.74
>50	3	2.11
TOTAL	142	100

Table 3 Respondent's Gender Recap

Gender	Total	Percentage
Male	72	51
Female	70	49
TOTAL	142	100

Refer to Table 4, the respondents' level of awareness and understanding of e-government quality is quite enough. Their answer to e-government usage frequency are most likely centred on ordinary (40.14%), many (16.9%), and not much (33.09%). However, for Open Data Usage Frequency (see Table 5), the answers are not really acceptable because the respondents are seldom use open government data as there are 35.2% who admitted that they use not much of open data, and 14.08% who never use open data at all. However, since the answers to the main questions of survey are valid, all of these respondents are still included in this study.

Table 4 E-Government Usage Frequency

E-Government Usage	Total Number	Percentage (%)
Never	8	5.63
Not much	47	33.09
Ordinary	57	40.14
Many	24	16.9
Much	6	4.22
TOTAL	142	100

Table 5 Open Data Usage Frequency

Open Data Usage	Total Number	Percentage (%)
Never	20	14.08
Not much	50	35.2
Ordinary	50	35.2
Many	18	12.6
Much	4	2.8
TOTAL	142	100

4.2 Data Reliability and Linearity

Reliability test was performed with SPSS 16.0. An indicator is said to be reliable when Cronbach's Alpha values exceed >0.6. Therefore, all measurements used in this study are reliable (see Table 6).

Table 6 Reliability Test Result

Measure		Cronbach's Alpha	Reliable
X _{1.1}	Systems Quality	.825	Yes
X _{1.2}	Information Quality	.829	Yes
X _{1.3}	Service Quality	.803	Yes
X _{2.1}	Openness	.880	Yes
X _{2.2}	Transparency	.695	Yes
Y _{1.1}	E-Information	.653	Yes
Y _{1.2}	E-Consultation	.617	Yes
Y _{1.3}	E-Decision Making	.858	Yes
Z _{1.1}	Organizational and Operations Performance	.907	Yes
Z _{1.2}	Build Customer Relationship	.906	Yes
Z _{1.3}	Support Sustainability	.855	Yes

Relationship assumption in the equation that required by GSCA is linear [33]. Therefore, prior to the GSCA test, the linearity test need to be done first. Consistency is represented on the significance value of p. When $p < 0.05$ then the relationship is linear and regression test if feasible. According to Table 7, it appears that all relationships are qualified, except for the relationship between E-Government Quality \rightarrow Citizen-Centric Government Performance ($X_1 \rightarrow Z_1$).

Table 7 Linearity Test Result

Variable	Significance	Linear
$X_1 \rightarrow Y_1$	.000	Yes
$X_2 \rightarrow Y_1$	.000	Yes
$Y_1 \rightarrow Z_1$	.000	Yes
$X_1 \rightarrow Z_1$	.641	No
$X_2 \rightarrow Y_1$	.004	Yes

4.3 Measurement Model

There are three measures of Fit in GSCA [34]: 1) measure of fit measurement model; 2) measure of fit structured model; 3) goodness of fit overall model. In this study, goodness of fit overall model was not conducted because the measurement for overall model is performed to assess the measurement model and structured model in integrated manner. The goodness of fit overall model only performed for a model that all the indicators are reflective.

Measure of fit measurement model is performed to assess the validity and reliability of each indicator [35]. For reflective indicator, validity is measured based on convergent validity in which by paying attention to loading values. An indicator is said to be valid when the loading values are significant, which is exceed 0.5-0.6. Discriminant validity of a variable is considered to be good when the square root of

AVE is greater than the correlations with overall latent variables. As for formative indicator, the validity is tested based on the substantive content in which by paying attention to weight values. A formative indicator is considered to be valid when the weight value is significant .05 level ($p < .05$). Furthermore, the internal consistency reliability also needs to be evaluated. Internal consistency reliability is considered to be good when the value of Alpha exceed 0.6. Some scholars also agree that alpha exceed 0.5 is acceptable [33].

Table 8: Correlations of Latent Variables

Correlations of Latent Variables (SE)				
	X ₁	X ₂	Y ₁	Z ₁
X ₁	1	.696 (.056)*	.399 (.079)*	.094 (.102)
X ₂	.696 (.056)*	1	.480 (.085)*	.230 (.103)*
Y ₁	.399 (.079)*	.480 (.085)*	1	.563 (.056)*
Z ₁	.094 (.102)	.230 (.103)*	.563 (.056)*	1

E-government quality is the variable with reflective indicators. Therefore, the value that needs to be examined is loading factor. Refer to the significance of value estimate and critical ratio (see Table 9) all indicators are valid and acceptable. E-government quality variable (X_1) has value of AVE = .774, thus the value of square root is .87. Refer to Table 8 the square root of e-government quality variable's AVE value is greater than the correlation with the other latent variables. Therefore the discriminant validity is good.

Table 9: E-Government Quality Conformity Assessment Result

Variable	Loading		
	Estimate	SE	CR
X ₁	AVE=.774, Alpha=.852		
X _{1.1}	.904	.019	48.63*
X _{1.2}	.885	.026	34.6*
X _{1.3}	.849	.033	25.57*

Open data also has reflective indicators. According to Table 10, all estimate and critical ratio values are significant, thus all indicators are valid. Open data variable (X_2) has value of AVE = .828, thus the value of square root is .90. Refer to Table 8, the square root of open data variable's AVE value is greater than the correlation with the other latent variables. Therefore the discriminant validity is good.

Table 10: Open Data Conformity Assessment Result

Variable	Loading		
	Estimate	SE	CR

Variable	Loading		
	Estimate	SE	CR
X ₂	AVE=.828, Alpha=.789		
X _{2.1}	.923	.017	55.75*
X _{2.2}	.896	.022	41.48*

Citizens' participation variable (Y₁) formed by 3 reflective indicators. As can be seen in Table 11, all indicators are significant. Value of AVE = .594, thus the value of square root is .77. Refer to Table 8, the square root of Citizens' Participation variable's AVE value is greater than the correlation with the other latent variables. Therefore the discriminant validity is good.

Table 11: Citizens' Participation Conformity Assessment Result

Variable	Loading		
	Estimate	SE	CR
Y ₁	AVE=.594, Alpha=.632		
Y _{1.1}	.642	.109	5.91*
Y _{1.2}	.889	.020	44.58*
Y _{1.3}	.762	.061	12.41*

Citizen-centric government performance variable is the variable with formative indicators. Therefore, the value that needs to be examined is weight. Referring to Table 12, the Organizational and Performance indicator (Z_{1.1}) has a value estimate = .182, standard error (SE) = .206 and critical ratio (CR) = .88, thus this indicator is not significant because failed to reach significant value at .05 level. Likewise Build Customer Relationship (Z_{1.2}) has value estimate = .328, SE = .297 and CR = 1.11, thus this indicator is also not significant. Support Sustainability indicator (Z_{1.3}) is the only indicator that significant because it has value estimate = .608, SE = .225 and CR = 2.71. Moreover, citizen-centric government performance variable (Z₁) has value of Alpha = .856. Therefore, this variable has good internal consistency reliability because the Alpha value reached ≥ 5 .

Table 12: Citizen-centric Conformity Assessment Result

Variable	Weight		
	Estimate	SE	CR
Z ₁	AVE=.000, Alpha=.856		
Z _{1.1}	.182	.206	.88
Z _{1.2}	.328	.297	1.11
Z _{1.3}	.608	.225	2.71*

4.4 Hypothesis Testing Result

Hypothesis testing was performed using GeSCA software and generated the path

coefficient values as depicted in Table 13 and Figure 2. The acceptance of each hypothesis is carried by considering the value of path coefficient in the structural model.

Table 13 Hypothesis Test Result

	Path Coefficients			Result
	Estimate	SE	CR	
X ₁ →Y ₁	.127	.109	1.16	Rejected
X ₂ →Y ₁	.392	.117	3.36*	Accepted
Y ₁ →Z ₁	.605	.062	9.83*	Accepted
X ₁ →Z ₁	-.204	.147	1.39	Rejected
X ₂ →Z ₁	.082	.135	.6	Rejected

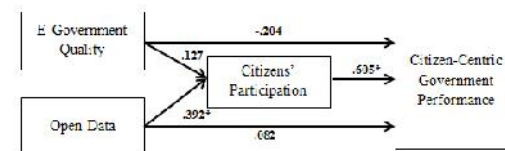


Figure 2 Hypothesis Testing Result: * significant at .05 level

Considering the Estimate and Critical Value (see Table 13), there are 2 hypothesis that are accepted and 3 are rejected. Positive and significant relationships occurred between Open data (X₂) and Citizens' Participation (Y₁) as well as between Citizens' Participation (Y₁) and Citizen-Centric Government Performance (Z₁). However positive insignificant relationship occurred between E-Government Quality (X₁) and Citizens' Participation (Y₁), also between Open Data (X₂) and Citizen-Centric Government Performance (Z₁). Even more, there is negative insignificant relationship between E-Government Quality (X₁) and Citizens' Participation (Z₁).

5. DISCUSSION AND IMPLICATION

5.1 The Impact of E-Government Quality towards Citizens' Participation

This study found that e-government quality has no significant impact towards citizens' participation. The unproven evidence of relationship between e-government quality and citizens' participation contradicting the statement of Bertelsmann Foundation [18] that to achieve balanced e-government, strengthening participatory elements is crucial. Nevertheless, the relationship among those two has the highest estimate value compared with the other insignificant relationships. Therefore, there is still a slight chance for them to be significantly correlated. The insignificant result might come from the uncontrolled age and occupation of respondents. Most of the respondents are students and are the youth (<30

years old), this condition leads to the misconception of e-government quality because the students and the youth are seldom use e-government system. In the other side, the respondents also composed by the elder and the working people who probably use e-government system more often and have more knowledge regarding e-government issues. The diversity of respondents' experience in using e-government system makes the responses inconsistent and failed to produce the desired outcome, because theoretically, the quality of information technology will trigger the action of user [36]. Which is in this case, the information technology is e-government initiative, while the action of user is citizens' participation.

5.2 The Impact of Open Data towards Citizens' Participation

This study reveals that the relationship of open data and citizens' participation is the second most significant among other relationships. Since the relationship of citizens' participation and citizen-centric government is also significant, the path from open data → citizens' participation → citizen-centric government is reliable. The more open government, it will encourage the citizens to be more participated in the e-government service. This result confirms the principles of open government idea which is engaging citizens in decision making (participation) and enabling the collaboration between government and both institutions (private and public) and citizens [25]

5.3 The Impact of Citizens' Participation towards Citizen-Centric

In this study, the relationship between citizens' participation and citizen-centric government performance is the most significant among other relationships. This result satisfied the theory of citizen-centric government that the essential manifestation of putting citizens as the first priority is by involving them through the development of government itself [37]. This result portrays a situation where the government performance on being citizen-centric will improved along with the escalation of citizens' participation.

5.4 The Impact of E-Government Quality towards Citizen-Centric

The phenomenon of insignificant relationship between e-government quality and citizen-centric government performance is

questionable yet predictable. It proved that this study had experienced the IT productivity paradox phenomenon. There were different ancient arguments regarding the direct impact of IT investment and performance. Dans [38], Dendirck & Kraemer [39] argued that IT investment is positively and directly correlated with performance. In contrary, Solow [40] and [41] stated that there is a negative relationship between IT investment and performance. Meanwhile, Strassman [42] could not see any relationship between IT investment and performance. The theory of Resource Based View (RBV) that invented the notion of strategic analysis to transform firm resources into goals [43] seems to be the answer. The relationship between e-government quality and citizen-centric government performance might be better explained if e-government quality is translated into not only good quality e-government (represented by information quality, system quality, and service quality) but also well managed IT based capability. Because, the IT strategy formulation that adapted from RBV theory believes that IT resources need to be transformed into IT based capabilities. IT based capability itself defines the *know-how* framework of an organization in formulating IT resources to enhance its core competencies. Furthermore, IT support for core competence could define the performance [6].

At first, this study predicted that e-government quality is the manifestation of government ICT resources into IT based capabilities as well as IT support for core competence. However, e-government quality failed to predict the performance. Looking back to the indicators that formed e-government quality which is systems quality, information quality, and service quality, there were nothing wrong with the indicators. All the indicators were valid and reliable. However, the relationship between e-government quality and citizen-centric performance did not pass the linearity test. Moreover, the estimate of path coefficient showed a negative result. This result implies the wrong assumption which is the worse e-government quality, the better citizen-centric government performance. In the other hand, it also can be assumed that the citizens who think that government performance is good enough have the tendency to think that the e-government initiative was not sufficiently meet their needs. In conclusion, there is a gap between e-government quality and citizen-centric government performance. Although the indicators were adapted from the Information System Success Model by Delone and McLean [27], it seems that information quality, system

quality, and service quality of e-government could not directly produce the net benefits.

5.5 The Impact of Open Data towards Citizen-Centric

This study proves that there is positive but not significant impact of open data towards citizen-centric government performance. The insignificant relationship between open data and citizen-centric government performance gives a description where open data would mean nothing if it is not being used by the citizens (citizens' participation). Even though open data does not directly related with citizen-centric government performance, but it is indirectly related with the mediation of citizens' participation. Moreover, although the estimation of path coefficient is not greater than the other significant relationships, this result gives enlightenment that if the government continues to improve open data services, the performance of citizen-centric government will be improved as well. Ambrose et al. [37] specified that the citizen-centric principle relies on making government service more transparent. More specifically, both indicators of open data are significant, but openness has greater loading estimate value compared with transparency. Thus, government need to keep improving the completeness, originality, timely, accessibility, universality, machine process-ability, open authorization, and information richness. By improving the quality of those nine key performance indicators, the performance of citizen-centric government will be improved right away. More importantly, government need to pay attention to the transparency level since this indicator has not reach the high estimate value yet (not higher than openness). Data that provided by open government data must be trustworthy, easy to understand, and openly provided so that citizens' sense of belonging towards government data would be enriched.

5.6 Research Implication

Research model of this study is constructed by the adaptation of IS Success Model theory by DeLone and McLean [27]. DeLone and McLean proposed a model that associates IS quality with the net benefit through intention to use and user satisfaction. Whilst IS quality is defined as information quality, system quality, and service quality. While in this study, those three variables are embodied within e-government quality and open data variable. Intention to use is defined as citizens' participation, while net benefit is interpreted as citizen-centric government. The missing point is user

satisfaction, which is at first assumed has been integrated within citizens' participation variable. However, the reassessment of each measurement items of citizens' participation is recommended to see whether user satisfaction has been described thoroughly. The research model development is illustrated in Figure 3. This study confirms IS Success Model theory which is IS/ IT investment (e-government) can trigger user's intention to use (citizens' participation) when the quality is high. Thus, user's intention to use can increase net benefit (citizen-centric government performance). This study also supports Bertelsmann [18] statement that to achieve balanced e-government, strengthening participatory elements is crucial. According to Andrews and Shah [21], government needs to provide tools for the citizens to: 1) give their demand as the input of government services initiative; 2) allow the citizens to evaluate government and civil servants performance. Thus, in this study, e-government has been proven to be the solution of such problem. This study also supports Savodelli et al. [7] who stated that to improve citizens' satisfaction e-government should provide high quality of services.

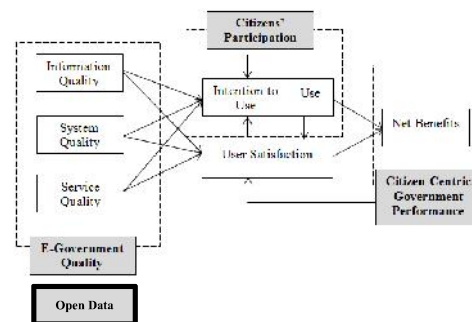


Figure 3 Research Model Adaptation from IS Success Model

The urge to develop individual model for e-government is because the main motif of e-government literature in the last decade has been suffered in the lack of independent theory [44]. Moreover, Bannister and Connolly stated that e-government will not be considered as a discipline until the development of a solid theory of its own. In fact, this study also adopted other theories which is IS Success Model to get the understanding of linkage between variables to finally form an assessment model for e-government. Research model of this study can be used for scholars as a reference to build an independent theoretical model for e-government literature. According to Wacker [45], the body of theory comprised: 1) definitions of terms or variables; 2) a domain where the theory applies; 3) a set of relationships of variables; 4) specific

predictions. Thus those 4 considerations have been completed in this study. This study is specifically useful as a reference for the government who initiates e-government program to gain better understanding of the priority and the interconnection between e-government quality, open data, citizens' participation, and citizen-centric government performance.

6. CONCLUSION

The purpose of this study is to gain better understanding of e-government initiative transformation process from merely ICT resources until become the establishment of government vision, in which being citizen-centric. According to the hypothesis testing, the conclusion is that citizen-centric government performance can only be directly affected by citizens' participation. Although open data can also affect the improvement of citizen-centric government performance, but it does not directly happen. Because open data needs to be improved in order to increase citizens' participation first, and then citizens' participation will directly improves citizen-centric government performance. Thus, open data has also proven to be directly affecting the improvement of citizens' participation. However, e-government quality does not directly and indirectly improve citizen-centric government performance.

7. REFERENCE

- [1]. United Nations. (2003). *UN Global E-government Survey 2003*. United Nations.
- [2]. United Nations. (2014). *United Nations E-Government Survey*. New York: United Nations.
- [3]. Baumgarten, J., & Chui, M. (2009). *E-government 2.0*. Retrieved 2015, from McKinsey on Government: http://www.mckinsey.com/insights/public_sector/e-government_20
- [4]. Seifert, J. W., & Chung, J. (2009). Using E-Government to Reinforce Government-Citizen Relationship. *Social Science Computer Review*, 27, 3-23.
- [5]. Reddick, C. G. (2007). E-Government and Creating a Citizen-Centric Government. In D. G. Garson, *Modern Public Information Technology Systems: Issues and Challenges* (pp. 114-135). Chapel Hill: IGI Global.
- [6]. Arslan, B., & Ozturan, M. (2011). The Path to Information Technology Business Value: Case of Turkey. *Technology and Investment*, 52-63.
- [7]. Savoldelli, A., Codagnone, C., & Misuraca, G. (2014). Understanding the e-government paradox: Learning from literature and practice on barriers to adoption. *Government Information Quarterly*, S63-S67.
- [8]. United Nations Development Programme. (2001). *Making new technologies work for human development*. New York: Oxford University Press.
- [9]. Rodríguez-Bolívar, M. P. (2004). The Need for Analyzing e-Government Efficiency: An Introduction. In M. P. Rodríguez-Bolívar, *Measuring E - government Efficiency* (pp. 1-7). New York: Springer.
- [10]. White House. (2009). *Momorandum on transparency and open government*. Washington, DC: White House.
- [11]. Carter, L. (2009). Digital Britain: final report. 7650.
- [12]. Attard, J., Orlandi, F., Scerri, S., & Auer, S. (2015). A systematic review of open government data initiatives. *Government Information Quarterly*, 32, 399-418.
- [13]. A. T. Kearney. (2009). *How to Become a Citizen-Centric Government*. Chicago: A.T. Kearney.
- [14]. Capgemini. (2012a). *Public services online 'digital by default or by detour?' Assessing user centric Egovernment performance in Europe. Final Background Report*. DG Connect.
- [15]. Fernández-i-Marín, X. (2011). The impact of e-government promotion in Europe: Internet dependence and critical mass. *Policy and Internet*, 4.
- [16]. Kang, D.-S., Kwon, H. Y., & Ko, Y. -S. (2008). Case Study on the Effects of Administrative Informatization on the Organizational Structure for the Central Government in Korea. In M. A. Wimmer, H. J. Scholl, & E. Ferro (Ed.), *Electronic Government* (pp. 49-60). Turin: Springer.
- [17]. Andersen, K., & Henriksen, Z. (2006). E-government Maturity Models: Extension of the Layne and Lee Model. *Government Information Quarterly*, 23, 236-248.
- [18]. Bertelsmann Foundation. (2001). *Balanced e-government – Connecting efficient administration and responsive democracy*. Retrieved from <http://en.bertelsmann-stiftung.de/index.html>
- [19]. De', R. (2008). Control, De-politicization and the eState. *Electronic Government* (pp. 61-72). Turin: Springer.
- [20]. Córdoba, J.-R. (2014). Systemic Patterns of Practice to Improve E-Government Evaluation. In M. P. Rodríguez-Bolívar,

- Measuring E-government Efficiency* (pp. 10-12). New York: Springer.
- [21]. Andrews, M., & Shah, A. (2003). Citizen-Centered Governance: A New Approach to Public Sector Reform. In A. Shah, *Bringing Civility in Governance: Handbook on Public Sector Performance Reviews* (Vol. 3). Washington D.C.: The World Bank.
- [22]. Heeks, R., & Bailur, S. (2007). Analyzing e-government research: Perspectives, philosophies, theories, methods, and practice. *Government Information Quarterly*, 24, 243-265.
- [23]. Ask, A., & Grönlund, Å. (2008). Implementation Challenges: Competing Structures When New Public Management Meets eGovernment. *Electronic Government* (pp. 25-36). Turin: Springer.
- [24]. Veljković, N., Bogdanović-Dinić, S., & Stoimenov, L. (2014). Benchmarking open government: An open data perspective. *Government Information Quarterly*, 31, 278-290.
- [25]. Open Government Partnership. (2012). *About*. Retrieved from <http://www.opengovpartnership.org/about>
- [26]. Gruen, N. (2009). *Engage: Getting on with government 2.0 report of the government 2.0*. Retrieved from <http://www.finance.gov.au/publications/gov20taskforcereport/>
- [27]. DeLone, W., & McLean, E. (2003). The DeLone and McLean model of information systems success: a ten-year update. *Journal of Management Information Systems*, 9(4), 9-30.
- [28]. Wolf, E., Harrington, K., Clark, S., & Miller, M. (2013). Sample size requirements for structural equation models an evaluation of power, bias, and solution propriety. *Educational and Psychological Measurement*, 73(6), 913-934.
- [29]. Sideridis, G., Simos, P., Papanicolaou, A., & Fletcher, J. (2014). Using Structural Equation Modeling to Assess Functional Connectivity in the Brain Power and Sample Size Considerations. *Educational and Psychological Measurement*.
- [30]. TEG. (2014). Retrieved 2015, from Taiwan E-Governance Research Center: http://www.teg.org.tw/web_zh/index.do
- [31]. Hoyle, R. (1995). *Structural Equation Modeling: Concepts, Issues, and Applications*. Thousand Oaks, CA: Sage Publication.
- [32]. Kline, R. B. (2005). *Principles and Practice of Structural Equation Modeling*. New York: Guilford Press.
- [33]. Subriadi, A. P. (2013). Information Technology Productivity Paradox: A Resource-Based View And Information Technology Strategic Alignment Perspective For Measuring Information Technology Contribution on Performance. *Journal of Theoretical and Applied Information Technology*, 541-552.
- [34]. Solimun. (2012). *Pemodelan Struktural Generalized Structured Component Analysis GSCA*. Malang: Universitas Brawijaya.
- [35]. Heungsun Hwang, H. (2004). *Generalized Structured Component Analysis*. Psychometrica.
- [36]. Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, 3(8), 982-1003.
- [37]. Ambrose, R., Lenihan, D., & Milloy, J. (2006). What is Citizen-centred Federalism and Why Does it Matter? In R. Ambrose, D. Lenihan, & J. Milloy, *Managing the Federation: A Citizen-Centred Approach* (pp. 5-17). Ottawa: The Crossing Boundaries National Council.
- [38]. Dans, E. (2001). IT Investment in Small and Medium Enterprises: Paradoxically Productive? *Electronic Journal of IS Evaluation*, 4(1).
- [39]. Dendrick, J., & Kraemer, K. L. (2001). The Productivity Paradox: Is it Resolved? Is there a New One? What Does It All Mean for Managers? *I.T. in Business*.
- [40]. Solow, R. M. (1987). *We'd Better Watch Out*. New York: New York Times.
- [41]. Brynjolfsson, E. (1993). The Productivity Paradox of Information Technology: Review and Assessment. *Communications of the ACM*.
- [42]. Strassman, P. (1990). *The Business Value of Computers: An Executive's Guide*. New Casnan, CT: Information Economics Press.
- [43]. Grant, R. M. (2001). The Resource-Based Theory of Competitive Advantage: Implication for Strategy Formulation. *California Management Review*, 114-135.
- [44]. Bannister, F., & Connolly, R. (2015). The great theory hunt: Does e-government really have a problem? *Government Information Quarterly*, 32, 1-11.
- [45]. Wacker, J. G. (1998). A definition of theory: Research guidelines for different theory building research methods in operations management. *Journal of Operations Management*, 16, 361-385.

8. APPENDIX

Table 14: Variable and Measures

Variables and Measures	
X₁	E-Government Quality
X_{1.1}	Systems Quality
X _{1.1.1}	Adaptability
X _{1.1.2}	Availability
X _{1.1.3}	Reliability
X _{1.1.4}	Response Time
X _{1.1.5}	Ease of Use
X _{1.1.6}	System Mobility
X _{1.1.7}	Cross-platform
X _{1.1.8}	Integrated Social Networking
X_{1.2}	Information Quality
X _{1.2.1}	Integrity
X _{1.2.2}	Easy to Understand
X _{1.2.3}	Personalization
X _{1.2.4}	Relevance
X _{1.2.5}	Information Security
X _{1.2.6}	Integrated Information
X_{1.3}	Service Quality
X _{1.3.1}	Assurance
X _{1.3.2}	Empathy
X _{1.3.3}	Services Responsiveness
X _{1.3.4}	Technical and Analytical Capabilities
X _{1.3.5}	Proactive One-Stop Service
X₂	Open Data
X_{2.1}	Openness
X _{2.1.1}	Completeness
X _{2.1.2}	Originality
X _{2.1.3}	Timely
X _{2.1.4}	Accessible
X _{2.1.5}	Universality
X _{2.1.6}	Machine Process-able
X _{2.1.7}	Non-single Ownership
X _{2.1.8}	Open Authorization
X _{2.1.9}	Information Richness
X_{2.2}	Transparency
X _{2.2.1}	Authenticity
X _{2.2.2}	Understand-ability

Variables and Measures	
X _{2.2.3}	Reusability
Y₁	Citizens' Participation
Y_{1.1}	E-Information
Y _{1.1.1}	Frequency of Access to Information
Y _{1.1.2}	The Importance of Information
Y _{1.1.3}	Degree of preference
Y_{1.2}	E-Consultation
Y _{1.2.1}	Feedback Frequency
Y _{1.2.2}	E-Consultation Importance
Y _{1.2.3}	Careful Thinking and Judgment
Y _{1.2.4}	The Impact of Citizen Feedback
Y _{1.2.5}	Degree of Responsibility
Y_{1.3}	E-Decision Making
Y _{1.3.1}	Participation Frequency
Y _{1.3.2}	Participation Depth
Y _{1.3.3}	The Importance of the Role
Y _{1.3.4}	Voluntary Level
Y _{1.3.5}	Consciousness Level
Z₁	Citizen-Centric Government Performance
Z_{1.1}	Organizational and Operations Performance
Z _{1.1.1}	Decrease in bureaucracy
Z _{1.1.2}	Decision Optimization
Z _{1.1.3}	Extensive Communication
Z _{1.1.4}	Strategic Alignment
Z _{1.1.5}	Positive Vibes
Z_{1.2}	Build Customer Relationship
Z _{1.2.1}	Government Responsiveness
Z _{1.2.2}	Customer Relations
Z _{1.2.3}	Survey
Z _{1.2.4}	Right Product, Right Service
Z _{1.2.5}	Collaborative Decision-Making
Z_{1.3}	Support Sustainability
Z _{1.3.1}	Sustainability
Z _{1.3.2}	Environment
Z _{1.3.3}	Paperless