

E-Government Adoption in Developing Countries; the Case of Indonesia

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ABSTRACT

Huge benefits and usefulness that offered by e-government and increasing number of Internet users Indonesia has raised government of the Republic of Indonesia to issue several policies on e-government development. The government has obligation to deliver better and faster public service through e-government. Since 2003 some e-government policies has been issued by the government but in facts year by year, the global rank of e-government readiness as well as regional rank of Indonesia still in low rank. Some previous studies found that success of e-government implementation is dependent not only government support, but also on citizen's willingness to accept and adopt e-government services. The research is to find out how the acceptance of Indonesian Internet users to e-government services, in terms of relative advantage, image, compatibility, and ease to use variables. Online survey has been published and collected 751 respondents. There are more than 93 percent of the respondents who have intention to adopt e-government. Relative advantage and compatibility variable were proven as useful factors to predict intention of use of e-government, otherwise the variable of image and ease to use is not proven. This study provides a trigger for the Indonesian government both central and local governments to develop and implement better e-government since 45 million Indonesian Internet users have been waiting for e-government services.

Keywords: *e-government adoption, innovation diffusion, public services*

1. INTRODUCTION

The development of information and communication technology (ICT) has brought impact to human life. Various sectors in people's lives have changed, including in the public service sectors. Government services which have been impressed by rigid bureaucratic and recently by the ICT can be replaced with e-government to be more flexible, and more oriented to user satisfaction. E-government offers the public service can be accessed 24 hours, whenever, and wherever the user is located. E-government also allows the public service to be more efficient since the service should not be conducted by face-to-face communication.

Recognizing the benefits of e-government, the Republic of Indonesian government has issued several policies related to e-government [1]. The government issued a policy on e-government implementation called the Presidential Instruction Number 3 in 2003 which outlines contains about: (a) development of a reliable and trustworthy services and affordable by the public, (b) restructuring of management systems and work processes of central and regional governments holistically, (c) optimal utilization of information technology, (d) participation improvement of the business sectors and development of ICT industries, (e) development of human resources in the government offices and improving e-literacy of communities, (f) Development of e-government by systematic approach which realistic and measurable stages.

The Presidential Decree was completed by the Guideline for E-Government Development issued by the Department of Communication and Informatics in 2003. This guideline regulated all government agencies including local governments, regarding: (a) development of government portal infrastructures, (b) management of government electronic documents, (c) planning development of e-government, (d) ICT training for supporting e-government implementation, (e) implementation of the Local Government Websites.

Then in 2004 the Department of Communication and Informatics also issued six guidelines that contain: (a) quality standards and service coverage, as well e-services application development, (b) institutionalization, authority, information, and business involvement in e-government development, (c) good governance development and change management, (d) e-government project implementation and budgeting, (e) competency standards of e-government managers, (f) blueprint of e-government application for central and local governments.

To complement the policy regarding e-government, which has been issued earlier, in 2006 the government, issued a policy relating to the use of ICT, which indirectly strengthen policies in the development of e-government. The policy is the establishment of the Council of National Information and Communication Technology (*Detiknas*). The Presidential Decree Number 20/2006 established the council. It was mandated to formulate public policy and strategic direction of national development, through the use of ICT [2].

Various policies above showed that the government of Indonesia has a political will for successful implementation of e-government in Indonesia, even to the level of local government. Moreover, with implementation of the Act Number 11 in 2008 regarding Information and Electronic Transactions (ITE). This Act supported to the public service transactions through e-government. However the completeness of the policy is yet to yield significant results for the development of e-government in Indonesia. It can be proved by E-Government Readiness Rank, according to the United Nation, Indonesia is still in low rank among other countries in Southeast Asia, moreover for Global Rank of E-Government Readiness. Indonesia's position in the E-Government Readiness in both Southeast Asia and global can be explained in the following table [3], [4], [5].

Tabel 1. E-Government Development in South Eastern Asia

Country		Global Rank			
		2004	2005	2008	2010
1	Singapore	8	7	23	11
2	Malaysia	42	43	34	32
3	Brunei Darussalam	63	73	87	68
4	Thailand	50	50	64	76
5	Philippines	47	41	66	78
6	Viet Nam	112	105	91	90
7	Indonesia	85	96	106	109
8	Cambodia	129	128	139	140
9	Myanmar	123	129	144	141
10	Lao PDR	144	147	156	151
11	Timor Leste	174	144	155	162

Among Southeast Asian countries, Indonesia's position is in the seventh rank, lower than Brunei and Vietnam, and only one rank higher than Cambodia. As for the global rank, Indonesia's position has decreased for each year. This facts are contrary to the number of Internet users in Indonesia, which has increased very significantly. In 2003 when the Presidential Decree on e-government Indonesia was issued, Internet users are only 8 million [6], whereas in 2010 the Indonesia Internet users increased dramatically to 45 million users [7]. Based on these facts, a research regarding e-government adoption of Indonesia Internet users is very necessary to be done, since the success of e-government implementation is dependent not only government support, but also on citizen's willingness to accept and adopt those e-government services [8].

2. TERMINOLOGY AND ADVANTAGE OF E-GOVERNMENT

The terminology of e-government has been often formulated by a lot of writers of e-government books and papers with varying emphasis, but they lead to the same

core that e-government is the use of information technology by the government in carrying out the duties of government and public services. As noted by Dawes [9] of which defines e-government as: "the use of Internet technology to support government operations, engage citizens, and provide government services. Another definition given by Drucker [10] where e-government is defined as: "the use of emerging information and communication technologies to facilitate the processes of government and public administration. In reality, though, real e-government is about choice. It is about providing citizens with ability to choice the manner in the which. They wish to Interact with the Governments. And it is about the Governments make choices about how information communication technologies will from be deployed to support citizen's choices. In addition, international institutions also provide terminology about e-government. The World Bank [11] defines e-government as: "to the use of new information and communication technologies (ICTs) by Governments as applied to the full range of government functions." While the European Commission notes that e-government is the use of information and communication technologies in Public Administrations combined with organizational change and view the skills in order to improve public services and democratic processes and strengthen support to public policies [12]. Implementation of e-government offered some advantages. Ferguson [13] noted various advantages that can be categorized in three categories:

1. Transforming services—making them more accessible, more convenient, more responsive and more cost—effective. It can make services more accessible to people with disabilities. It can make it easier to join up local services (within council, between councils, and between councils and other public, voluntary and private agencies). It can help improve the customer's experience of dealing with local public services, whoever provides them
2. Renewing local democracy—making councils more open, more accountable, more inclusive and better able to lead their communities: e-government can enhance the opportunities for citizens to debate with each other, to engage with their local services and councils, to access their political representatives and hold them to account. It can also support councillors in their executive, scrutiny and representative roles.
3. Promoting local economy vitality—a modern communications infrastructure, a skilled workforce and the active promotion of e-business can help councils and regions promote employment in their areas in improve the employability of their citizens.

While Caldow [14] classified the advantage of e-government into the internal and external:

1. Internal: these new technologies contribute to an improvement of the internal efficiency of public administrations, by streamlining information and administrative process management—which will have an impact on relations between

administrative apparatuses at both a horizontal level (between agencies, departments, and ministries) and vertical one (between central and local agencies)

2. External: ICT enables better management of external relations---with the constituency—ensuring higher standards of service and information delivery to the public, as well as—at least potentially—enabling levels of democratic participation that were previously unimaginable.

3. THEORETICAL FRAMEWORK AND HYPOTHESIS

This study used innovation diffusion theory by Rogers [15] as main theory and merged with Perceived Characteristics of Innovating (PCI) by Moore & Benbasat [16]. Innovation diffusion is the process by which innovation is communicated through certain channels over time among members of social system [15]. Innovation can be defined as the situationally new development and introduction of knowledge-derived tools, artifacts, and devices by which people extend and interact with their environment [17]. Innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption [15].

Main consideration of using innovation diffusion

theory since this model has effectively been used in thousands of studies across many fields including sociology, political science, civics, marketing, public health, communications, economics, education, and technology [18]. Some researches in the field of ICT adoption also used the theory of innovation diffusion and PCI [19],[20], [22],[23],[25],[26],[27],[28]. In this research, e-government is a new idea and practice that is perceived by society for public service application.

This study used characteristic of innovation as main variable. According to Rogers [15] the characteristics of innovation consist of: relative advantage, compatibility, complexity, trialability, and observability. Other authors stated characteristic of innovation included: related advantages, image, compatibility, ease of use, visibility, results demonstrability, trialability, and voluntariness of use [16]. Although there are a variety of characteristic of innovation, based on similar research has been done by Carter and Belanger [19], Karahanna et al. [29], Moore and Benbasat [30], Craig et al. [31], and previous research about e-government by Rokhman for Indonesia's cases [32],[33],[34], this study uses four characteristics namely: relative advantages, image, compatibility, and ease to use, as independent variables. While the intention to use is treated as the dependent variable, developed in the form of a dummy or dichotomous variables. Description variables and items can be explained in the table 2.

Table 2 Description of Variables

Variable	Description	Item
Relative Advantage	Degree to which an innovation is perceived as better than the idea it supersedes	<ul style="list-style-type: none"> • Using the Web would enhance my efficiency in gathering information from state government agencies. • Using the Web would enhance my efficiency in interacting with state government agencies. • Using the Web would make it easier to interact with state government agencies. • Using the Web would give me greater control over my interaction with state government agencies.
Image	Degree the innovation enhances one's reputation with peers	<ul style="list-style-type: none"> • People who use the Web to gather information from state government agencies have a high profile. • People who use state government services on the Web have a high profile. • People who use the Web to gather information from state government agencies have more prestige than those who do not. • Interacting with state government agencies over the Webperson's social status.
Compatibility	Degree of perceived consistency with one's value, experiences, and needs	<ul style="list-style-type: none"> • I think using the Web would fit well with the way that I like to gather information from state government agencies. • I think using the Web would fit well with the way that I like to interact with state government agencies. • Using the Web to interact with state government agencies would fit into my lifestyle. • Using the Web to interact with state government agencies would be incompatible with how I like to do things.
Ease of Use	Perceived degree of difficulty with	<ul style="list-style-type: none"> • Learning to interact with a state government Website would be easy for me • I believe interacting with a state government Website would be a clear and understandable process



	using the innovation	<ul style="list-style-type: none"> I would find most state government Website to be flexible to interact with I would be easy for me to become skillful at using a state government Website
Use Intentions	Degree of intention to use an innovation	<ul style="list-style-type: none"> YES= I would like to use e-government services that provide by the government NO= I would not like to use e-government services that provide by the government

Adopted from: Rogers [15], Moore & Belbasat [16], Tortnatzky and Klein [35], Carter & Belanger [29], and Richardson [36]

Based on theoretical framework, this study has four hypotheses:

- H1: The degree of relative advantage can be used to predict Internet users probability to adopt e-government
- H2: The degree of image can be used to predict Internet users probability to adopt e-government
- H3: The degree of compatibility can be used to predict Internet users probability to adopt e-government
- H4: The degree of ease of use can be used to predict Internet users probability to adopt e-government

4. RESEARCH METHOD

The research population is Internet users Indonesia wherever they are living, included overseas countries. Although the Indonesian Internet users is estimated at 45 million users [7], but there is no sampling frame or the complete list of Internet users that can be used as guideline for taking sample. Therefore, the respondents of this research are the Internet users who are willing to fill voluntary an online questionnaire that the invitation was published on Facebook on December the 1st to 30 October 2010. Basic consideration of using Facebook since according to Inside Facebook [37] Indonesia is Third-Largest Country of Facebook Users in May 2010 with number 22.4 million users, and according to Alexa [38] the top site of Indonesia is Facebook. The online questionnaire was published at <http://egov-survey.map.unsoed.ac.id>. The questionnaire items are measured by a Likert's scale ranging from 1 to 5 (1="strongly disagree", 5="strongly agree"). Except for question about intention for use e-government, due to dichotomous or binary variable, there are only two options

answer (1="would like to use e-government", 0="would not like to use e-government"). A pre-test was conducted among the respondents to check reliability and validity of the questionnaire. Since the outcome variable is dichotomous (binary) the binary logistic regression model was used to analyse the data [39].

Reliability and Validity of the Instrument

Reliability measurement was done in this study. Table 3 shows that the Cronbach's Alpha valued obtained in this study ranged between 0.65 and 0.89, suggesting that the measurement used in this study was reliable. A Cronbach's Alpha score of more than 0.6 implies that the construct measurements are reliable [40].

Table 3 Reliability Results

Construct	Number of Items	Cronbach Alpha
Relative Advantage	3	0.80
Image	4	0.89
Compatibility	4	0.65
Ease to Use	4	0.80

Factors analysis was performed to evaluate validity of constructs. Table 4 shows the output of factor analysis using principle components analysis with varimax rotation. As can be seen most item loaded properly with value more than 0.45 (acceptable in social sciences research [41], therefore one item RA4 were dropped from further analysis due to the value lower than 0.45.

Table 4 Rotated Component Matrix

Items	RA1	RA2	RA3	IM1	IM2	IM3	IM4	CO1	CO2	CO3	CO4	EU1	EU2	EU3	EU4
RA	0.75	0.74	0.70												
IM				0.86	0.87	0.86	0.77								
COM								0.73	0.79	0.69	0.60				
EOU												0.83	0.83	0.79	0.69

5. FINDINGS AND DISCUSSION

There are 751 Indonesia Internet users who participated in the survey that consist of 705 (93.9 percent) who have intention to adopt e-government and only 46 (6.1 percent) have not intention to adopt. This figure indicated that very strong majority of Internet users have high expectation to get benefit from public services delivery thorough e-government. The demographics of all respondents are explained in Table 5.

Table 5 Respondent Profile

Characteristics	N	Percent
Intention		
Adopter	705	93.9
Non Adopter	46	6.1
Gender		
Female	227	30.2
Male	524	69.8
Age		
<=20	51	6.8
21-30	310	41.3
31-40	248	33
41-50	122	16.2
51-60	17	2.3
>60	3	.4
Education		
High School	91	12.1
Diploma	33	4.4
Bachelor	436	58.1
Master	161	21.4
PhD	30	4.0

Further, logistic regression analysis is conducted to distinguish e-government adopters and non-adopters. Intention to use e-government is the dependent variable, and relative advantage, image, compatibility, and ease of use are independent variables. The Chi-Square test for full model was significant ($X^2 = 42.275$ at $p=0.00$), suggest that the model is useful. The classification of the full model is correctly predict e-government adopter and non-adopter about 93.7 percent of original grouped cases were correctly classified, which means that only 6.3 percent of the total cases are not correctly classified (reported in Table 6).

Table 6 Logistic regression model for e-government adoption

Variable	B	S.E	Wald	Df	Sig.	Exp(B)
Relative adv.	.287	.110	6.874	1	.009	1.333
Image	-.007	.057	.016	1	.901	.993
Compatibility	.230	.084	7.602	1	.006	1.253
Ease to use	.091	0.57	2.556	1	.110	1.095
Chi-Square= 42.275, df=4, P<0.000						
Accuracy= 93.7%, sample size= 751						

Among four independent variables, two significant variables in the model are relative advantage and compatibility (H1 and H3 are supported). Relative advantage (0.287, $P<0.01$, Exp(B) 1.33) indicated the degree of relative advantage can be used to predict Internet users probability to adopt e-government. Intention to use e-government services increases as a relative advantage increases. For every unit increases in relative advantage, then the intention to use e-government increases by 1.33 times). This result is consistent with previous studies about innovation and e-government adoption by Jungwoo [42], More and Belbasat [16], Chen [43], Tylor and Todd [44], Tan and Teo [45], Ploueffe et al. [46], Richardson [37], Lu et al. [23], Bouwmen et al. [47], Carter and Belanger [19], Fieu et al. [48], Rath and Sekhar [49], and Van Slyke et al. [50]. The respondent recognize that using e-government would enhance their efficiency in gathering information from government agencies, enhance their efficiency in interacting with government agencies, and make easier to interact with the government agencies.

Compatibility (0.230, $P<0.01$, Exp(B) 1.256) indicated the degree of image can be used to predict Internet users probability to adopt e-government. Intention to use e-government services increases as a compatibility increases. For every unit increases in compatibility, then the intention to use e-government increases by 1.259 times). This finding is consistent with the study of More and Belbasat [16], Jungwoo [43], Carter and Belanger [19], Hung et al. [51], Phang et al. [52], Hussein et al. [53], Parthasarathy and Bhattacharjee [54], Tan and Teo [55] (2000), Lau [56], Hardgrave et al. [57], Gerrard and Cunningham [58], Richardson [37], Lu et al. [23], Bouwmen et al. [48], Meijer et al. [59], Mofleh and Wanous [60], Lee and Lei [61], and Schaupp and Carter [62]. This finding shows Indonesian Internet users sure that using e-government would fit well with the way that they like to gather information and interact with the government agencies, also e-government would fit with their life style.

Two not-significant variables in the model are image and ease to use (H2 and H4 are rejected). The results show that image is not good predictor of intention of use e-government. The degree of image can not be used to predict Internet users probability to adopt e-government. This finding is consistent with previous work by Carter and Belanger [19], Richardson [36], Lu et al. [27], Rath and Sekhar [49], Schaupp and Carter [62], and inconsistent with study of Phang et al. [52], Hussein et al. [53], Plouffe et al. [46], and Hun et al. [63]. The interesting point for these findings that is intention of Indonesian Internet users to use e-government is not for image or status reason. Using e-government is not to increase their status but for getting advantages from the government services. This fact also can be explained by the majority of the respondents (58.1 percent) have education degree in bachelor who for Indonesian society this people segment are in middle-high status.

The degree of ease of use could not be used to predict Internet users probability to adopt e-government.

<http://www.cisjournal.org>

This result is consistent with previous research by Jungwoo [42], Taylor and Todd (1995), Parthasarathy and Bhattacharjee [54], Lu et al. [27], Rath and Sekhar [49], Schaupp and Carter [62], and inconsistent with previous work of Carter and Belanger [19], Hung et al. [51], Kumar et al. [64], Al-adawi et al. [65], Wangpipatwong et al. [66], Colesca and Liliana [67], and Richardson [39]. This fact can be explained by data concerning how many years the respondents have been using the Internet. They have been using the Internet in average are 7.9 years. This data indicated they already familiar with the Internet and ready to use e-government services. The Internet is a part of their life now.

6. CONCLUSION

This study have very useful findings for the development and implementation of e-government of Indonesia. Although the global ranking of e-government readiness is in low level, but expectation of Internet users toward e-government is very big, evidenced by the existence of more than 93 percent of the respondents have an intention to use e-government. The presumption that the Indonesian people were not ready with e-government through this research is not proven. Segment of society with the status of a middle-high class was very ready to use e-government. Another presumption that e-government that does not fit with the lifestyle and cultural communities are also indisputable. Through variable compatibility, this research has proved that e-government is compatible with their lifestyle and culture, and they ready when public services will not be delivered by face to face. Finally, this research provides a trigger for the Indonesian government both central and local governments to develop and implement better e-government since e-government had been awaited by about 45 million Indonesian Internet users.

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