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Research Article

What Motivate Government Employees to Use an e-Government System? The Adopter Profiles and Acceptance Factors

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Abstract: E-government system has changed government to citizen interactions. The challange that arises is low acceptance of e-government system by government employees. This study aims to investigate the factors that motivate government employees to use e-government system by constructing a conceptual model based on Unified Theory of Acceptance and Use of Technology and identifying the adopter characteristics using Innovation Diffusion Theory. Validated model, recommend that government should concentrate on the factors of performance expectancy, social influence and facilitating condition and select government employees who are belong to Early Adopter category as the agent of change to influence other employees to accept e-government systems.

Keywords: Adopter characteristics, e-government acceptance, innovation diffusion theory,unified theory of acceptance and use of technology

INTRODUCTION

The use of Information Communication Technology (ICT) or e-government system for delivering public services has dramatically changed how citizens interact with their government and improve the expectations on government services. There are enough evidences that well-designed e-government systems combined with process reforms have reduced discretion vested with civil servants, reduced corruption, enhanced efficiency and quality of public services (faster responses and services, more flexible in time and place, larger coverage) (Bhatnagar, 2014).

Despite the obvious potential benefits e-government proffers, these cannot be achieved if government employees who should use or operate the e-government systems are not willing to use them (Sarikas and Weerakkody, 2007). The government employees as the user or operator of e-government systems play an important role in the success of an e-government service. A government employee who rejects to use or is not motivated to use an e-government system may operate the system inappropriately or even discourage the other employees to use the system (Sarikas and Weerakkody, 2007; Al-Busaidy and Weerakkody, 2011).

Many cases found low acceptance of e-government systems by government employees. Consequently they tend to reluctant to operate e-government system in appropriate manner (Bwalya, 2009; Stam *et al*., 2004). Therefore, it is important for every government organization to have strategies for improving the acceptance of e-government systems they use among their employees.

In order to improve the adoption of an innovation, such as e-government systems, Rogers (2003) suggests two strategies: first is identifying attributes of the accepted technology then design and promote the technology based on the attributes, second is identifying characteristics of the accepting users then choose, educate and motivate the target users who fit with the characteristics as the agent of changes for promoting the innovation. It is suggested that an innovation should have five attributes of accepted technology: relative advantage, compatible, less complex, trialable and observable and the innovation should be promoted by the agent of changes who have characteristics of Early Adopters who will ease to accept an innovation and promote it to the other people in the community.

A number of studies have been conducted to investigate the acceptance factors of e-government systems using technology acceptance theories and models such as, Theory of Reasoned Action (TRA) (Ajzen and Fishbein, 1980), Theory of Planned Behavior (TPB) (Ajzen, 1991), Technology Acceptance Model (TAM) (Davis, 1989), Extension of Technology Acceptance Model (TAM2) (Venkatesh and Davis, 2000),Innovation Diffusion Theory (IDT)(Rogers, 2003) and Unified Theory of Acceptance and Use of Technology (UTAUT) (Alshehri *et al*., 2012). There is lack of studies on e-government acceptance

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factorsparticularly by government employees. However, the existing studies could provide valuable insight into the individual's acceptance of e-government and a basis for the acceptance factors of e-government by government employees.

Nevertheless, there is lack of research focused on government employee regarding their intention to use e-Government system. Only a few studies in the e-Government adoption on which concentrate government employee perspective (Al-Busaidy and Weerakkody, 2011; Zhan *et al*., 2011) without any consideration on adopter profiles. Considering the critical role of government employees in the acceptance of e-government systems and the lack of researches focusing on government employees, this study aims to investigate e-government acceptance on government employees and the characteristics of accepting users by answering these research questions. 1. What factors motivate government employees to use e-government systems? 2. What are the characteristics of adopters of e-government systems among government employees?

MATERIALS AND METHODS

Research methodology: In order to answer the research questions, this study was conducted in four main steps: first is constructing conceptual model, second is developing a questionnaire for measuring every variable in the conceptual model and an interview protocol for identifying and classifying of the e-government adopters and finally is validating the conceptual model based on questionnaire's feedback. Descriptive statistics is also performed in order to identify e-Government adopter's profile. Figure 1 present the research steps.

This study refers two prominent models to cope with the issue of e-government acceptance on government employees. The Unified Theory of Acceptance and Use of Technology(UTAUT) will be used as the conceptual model for analyzing the acceptance factors (Fig. 2), while the Innovation Diffusion Theory (IDT) will be used for investigating the characteristics of e-government adopters among government employees (Table1). Samaradiwakara and Gunawardena (2014) suggest that UTAUT provide a solid base to explain why users accept or reject a technology in a specific perspective. It posits four main construct (performance expectancy, Effort Expectancy, Social influence and facilitating conditions) and considered the role of age, gender and education (Alshehri *et al*., 2012). Each construct defines an individual's perceived of e-Government system. Performance expectancy refers to degree of certainty that e-Government system will improve their performance. Effort expectancy refers to the level of convenience perceived for using e-Government system. Social influence refers to degree to which an individual perceives that important others believe he should use the new system. Facilitating condition refers to an individual's perceived on infrastructure required for e-government system (Alshehri *et al*., 2012).

Whereas, Rogers (2003) in Diffusion of Innovation suggests to understand the adopter profiles as a strategy in promoting innovation adoption. Further, the adopter profiles might be employed to promote e-Government acceptance on government employees. Adopter profiles fall into 5 categories, namely innovators, early adopters, early majority, late majority and laggard. These categories represent the group in which an individual first begins accepting new innovation (Rogers, 2003). Innovators is refer to the individual or group of adoption who brings new innovation idea to social system. Early adopters seem to be the successor of innovator, by adopting an innovation and influence the others to accept new idea. The early majority is refer to the follower of innovation but need relatively longer time to decide to adopt the innovation. The last two categories are more skeptical toward innovation. Late majority adopt innovation if only most others in the population have done so and it is likewise the laggard who prefer to use traditional system (Rogers, 2003).

Data collection and respondent: In order to validate the conceptual model of e-government acceptance factors for the government employees, this study used government employees in village's administrations in Surabaya city as the object. Surabaya city is chosen because it has a great reputation in e-government services nationally and internationally and considered as a role model for the other cities in Indonesia. Surabaya has 154 village's administrations with 1,939 employees. Yamane sample calculation (Singh and Masuku, 2014) recommended 100 people minimum as the sample for the population. This studyconducted a survey collecting data involving 108 government employees in the village's administrations

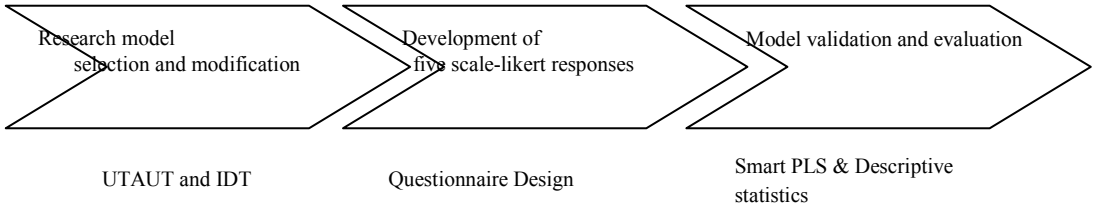

Fig. 1: Research steps

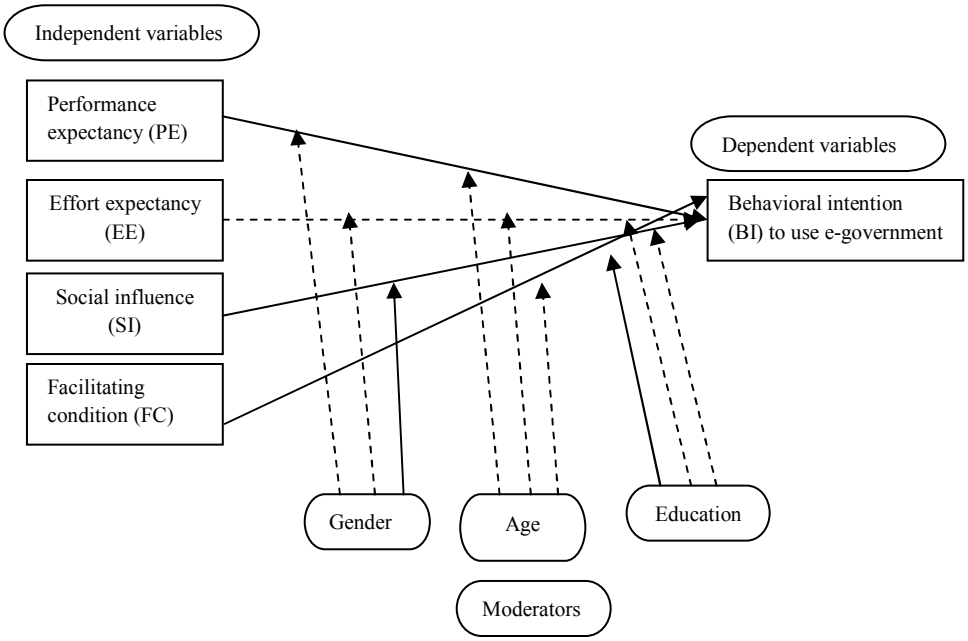

Fig. 2:UTAUT Model as conceptual model of the e-government acceptance factors

Table 1: Technology adopters model based on the IDT

Adopter category	Indicators	Characteristic
Innovators	Always wondering to experience new idea	Risk taker
	Always prepare to face the uncertainty of innovation or new idea	
Early adopter	Having great influence on innovation acceptance in their social systems	Role model
	Being an advisor of innovation adoption in their social systems	
	Get respect from other members of their social systems	
	An individual to check before adopting an innovation	
Early majority	Deliberate in adopting an innovation	Deliberate
	Need longer time to accept an innovation	
Late majority	Prefer to wait until most of their peers adopt an innovation	Skeptical
	Hesitate to new innovation	
	Accepting new innovation by enforcement	
Laggard	Prefer to use traditional systems	Traditional
	Decide to accept an innovation in relatively long period	
	The last person or group who adopt an innovation	

Table 2: Characteristics of respondent in this study

Indicator	Criteria	Total
Age	≥ 20	74
	≤ 58	34
Gender	Male	55
	Female	53
Education	Primary school-senior school	45
	Diploma	5
	Undergraduate-post graduate	57

who has been using e-government systems. Table 2 presents the respondents' characteristics of the study.

The questionnaire for validating the conceptual model was designed based on the UTAUT model using five-scale Likert and the Smart PLS software, while the interview protocol for investigating the adopter's characteristics of e-government systems was developed based on the IDT theory.

RESULTS ANDDISCUSSION

Initially, the validity and reliability test were performed to the questionnaire. All items are validated based on its Pearson Correlation score that recommended removing some questions in the questionnaire. The Pearson correlation showed scores of 0,330 to 0,772 indicating that that questionnaire is valid (Table 3). To estimate the reliability of the questionnaire, a *Cronbach's Alpha* is used since it most common method of estimating reliabilityof a

Table 3: Validity test based on Pearson correlation score

Dimension	Table -r	Pearson correlation	Result
PE1	0.3294	0.660	Valid
PE2	0.3294	0.752	Valid
PE3	0.3294	0.688	Valid
PE4	0.3294	0.330	Valid
PE5	0.3294	0.680	Valid
EF1	0.3294	0.520	Valid
EF2	0.3294	0.769	Valid
EF3	0.3294	0.580	Valid
SI1	0.3294	0.518	Valid
SI2	0.3294	0.660	Valid
FC1	0.3294	0.772	Valid
FC2	0.3294	0.575	Valid
FC3	0.3294	0.718	Valid
FC4	0.3294	0.644	Valid
BI 1	0.3294	0.819	Valid

Table 4: Reliability test of UTAUT model's variables based on *Cronbach's Alpha*score

Variable	Cronbach's Alpha	Result
Performance expectancy	0.804	Reliable
Effort expectancy	0.815	Reliable
Social influence	0.781	Reliable
Facilitating condition	0.709	Reliable
Behavioral intention	0.983	Reliable

Table 5: Reliability test of adopter characteristics variables based on *Cronbach's Alpha*score

Variables	Cronbach's Alpha	Result
Innovator	0.601	Reliable
Early adopter	0.619	Reliable
Early majority	0.660	Reliable
Late majority	0.640	Reliable
Laggard	0.610	Reliable

questionnaire. The Cronbach's Alpha scores are 0.601 to 0.983 indicating acceptable reliability (Table 4 and 5).

The validated model (Fig. 3) confirmed that performance expectancy, social influence and facilitating condition had significant impact toward behavioral intention to use e-Government. It means that government employees are more likely to use an e-government system if they perceive that the system offers more benefits to them such as supporting their job performance or improving rewards. They also tend to use the system if they have tools or facilities to access the system and their social systems (such as their peers or supervisor) also have big influence on their decisions to use or not to use an e-government system. Subsequently, gender moderates the impact of social influence on behavioral intention and education moderates the impact of facilitating conditions on behavioral intention to use e-government systems.

The questionnaire and the interview for identifying characteristics of the e-government adopters found that most of government employees are categorized into Early Adopter (51.85% of total respondent), followed by Early Majority (40.74%), Innovator (4.62%) and only 2.78 % is categorized as Late Majority. Laggard category is not found in the study. The result is slightly different if comparing with innovation diffusion theory by Rogers (2003). He mentions that most of adopters in one population would be categorized in Early Majority and Late Majority, followed with Early Adopter, Innovator and Laggard respectively. This study suggests that Surabaya city has big portion of government employees who are easily to accept an innovation like e-government systems. The Early Adopter employees have potential to promote the innovation to the other employees. These Early Adopters group should be chosen as the agent of change for speeding the diffusion process for every e-government service. They could be the role models for many other members in their networks because by its nature they have the greatest degree of leadership and capable of influencing other members to accept new innovation (Akbar, 2015).

According to the interview as presented at the Table 6, It is identified that Early Adopters, Early Majority and Late Majority have similar characteristics in every indicators.Frequencyof social activities

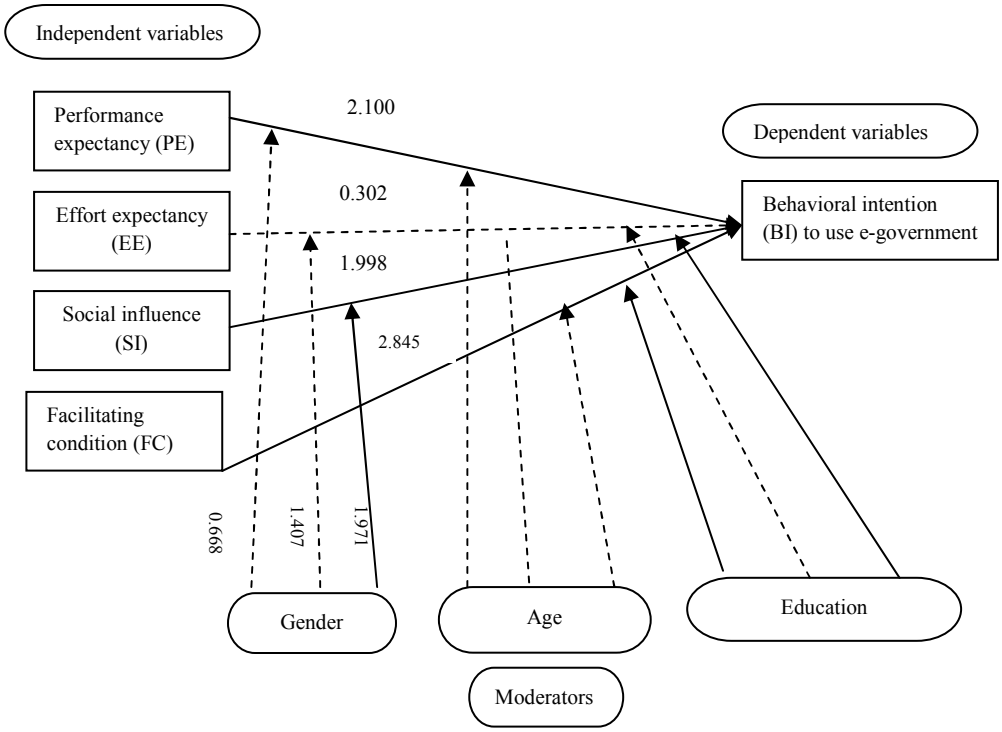

Fig. 3: Final model of user acceptance factors of e-government system by government employees (-- not significant, -significant)

Table 6: Adopter characteristic of e-government acceptance on government employees in village's administration

	Indicators	
Category	Income	Social activities involvment
Innovator	≥ Rp 5.000.000	3 times
Early adopter	Rp 500.000 – Rp 10.000.000	1-3 times
Early majority	Rp 500.000 – Rp 10.000.000	1-3 times
Late majority	Rp 500.000 – Rp 10.000.000	1-3 times
Laggard	-	-
	Indicators	
Category	Time to use e-Government	Distribution of official position
Innovator	First time of implementation	Top management
Early adopter	First time of implementation	Top management to officer level
Early majority	First time of implementation	Top management to officer level
Late majority	First time of implementation	Top management to officer level
Laggard	-	

involvement in a year indicating that every adopter categories have a good interaction in their social systems. Most of them actively participating on social activities for 1-3 times a year. They are also identified to be either on officer level or top management position such as Head of Department with average income varies between Rp 500.000-Rp 10.000.000. It is imply that the government employees who belong to these categories are easily to interact in their social system. Social interaction is important in order to disseminate new innovation such as e-government system. On the other hand, the Innovators have different characteristics among other categories. All of them are identified as top management level such as Head of Department or even Head of Village's Administration with the average income of equal or higher than Rp 5.000.000. Be on top management indicating strong leadership role than other members have. They will lead other members to use e-government system since the early stage of implementation. By identifying the characteristics of the adopters, government can select the right person to be an agent of change for every new e-government system.

The characteristics of e-government adopter found in this study is different if comparing to adopter characteristics mentioned by Rogers (2003) in Innovation Diffusion Theory particularly in the level of e-government acceptance and leadership role. Each category supposed to has different level of acceptance toward innovation. Innovators are the pioneer in experiencing new innovation such as e-government system. Whereas the most influential group of e-government acceptance among their social system by showing strong leadership role should be Early Adopter. Early Majority is supposed to have similar characteristics with Early Adopter in term of social interaction but it should be less leadership. They tend to wait the other members decision before accepting new idea. While Late Majority supposed to be more skeptical toward innovation and will need longer time to accept e-government system. In this case, government might have enforced their employees to use e-government system by issuing some regulations under good governance issues. Thus, they perform similar characteristics toward the intention to use e-government system at the early stage of implementation. Government employees might perceive e-government system as mandatory use instead of voluntary. Mandatory use refers to scenarios where the user must adopt specific technologies to provide government services. Hence, all employees will use e-government system either by enforcement or voluntarily at the appointed time.

These findings provide some insights and recommendations to the practitioners in the e-government program to have successful e-government implementation. It suggests that e-government adoption might be optimally achieved, if government concentrated on the improvement of e-Government acceptance factors, notably performance expectancy, social influence and facilitating condition. An e-government system should be designed and developed by offering more benefits and supports on the government employees' jobs. Government should provide facilities for their employees to access e-government services, such as providing PCs, laptop and Internet connection. Considering the big influence of social environment on the decision to use an e-government system, the government should promote and encourage or even enforce their employees to use the e-government systems appropriately. Government may identify the Early Adopter employees based on this study recommendation and propose them to be a trainer and motivator for using e-government services to their co-workers.

CONCLUSION

This study identified that performance expectation, social influence and facilitating condition significantly impact on the intention of government employees to use e-government system. Considering the significant impact of these factors on motivating government employees to use e-government systems, government should pays more attention to these factors by developing advantageous e-government systems for

government employees which support their job performance and providing them with reliable ICT infrastructure to access the systems.

Moreover, Considering the characteristics of e-government adopter among government employees in village's administration, government should be optimizing the potential of Early Adopter by facilitating them with extensive courses or workshops on e-government system, thus they could be an agent of change to motivate other government employees to use e-government system appropriately and voluntarily.

In the future we recommend to evaluate more aspects related to e-government acceptance such as organization culture and government policy that might contribute to e-government acceptance.

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CONFLICT OF INTEREST

The author(s) declared no potential conflicts of interest with respect to the research, authorship and/or publication of this study.

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