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Integrated Model Development in Information Technology Adoption

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INTEGRATED MODEL DEVELOPMENT IN INFORMATION TECHNOLOGY ADOPTION

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Abstract

Electronic services have become an important part in the implementation of electronic governance. Government electronic services are an important tool for effective cooperation in any country between government, authorities, citizens, organizations, and so on. The purpose of this research is to identify and collect, analyze and compile various factors that influence the implementation process of electronic government services. The use of e-government is very dependent on how the user, trust in using and adopting the service. Some barriers to adopting e-government services such as lack of trust are considered as one of the main obstacles. In addition, citizens 'trust in e-government and social influence were found to be significant predictors of citizens' behavioral intentions to use e-government services. This study contributes by providing a conceptual model that is useful for studying citizen trust and the behavior of using e-government services in Indonesia.

Keywords: adoption, e-government, trust, intention, acceptance of technology

1.   Introduction
1.1 Background
The development of information and communication technology - ICT (Information and Communication Technologies - ICT) has become a global trend, including for digitizing the government sector, better known as electronic Government (e-Governrment). The development of e-Government by a government institution aims to improve information and service connectivity quickly and efficiently, not only between institutions but also equally important as the public as users of public services.

e-Government is a reform or a new paradigm of government implementation that refers to Public Information Openness which gives the government responsibility to provide information about ongoing government activities.

Emphasizes that e-Government is the use of information technology by bodies that have the ability to realize the relations of citizens, business people and government institutions [1]. Meanwhile, according to EZ Gov, the notion of e-Government is the simplification of government practices using information and communication technology. So it is clear that e-Government aims at efficiency because it is a simplification in government practice [2].
"E-Government is a way for government information and services, to improve the quality of the services, and to improve the quality of the services. (New Zealand Govenrment).
In essence, E-government (e-gov) is the process of using information technology as a tool to help run the government system more efficiently. Therefore, there are two main things in the definition of e-gov above; the first is the use of information technology (one of which is the internet) as a tool, and, secondly, the purpose of its utilization so that the government can run more efficiently.

The definition of e-government according to experts varies. According [4], e-Government is defined as the use of ICT to support good governance. Further explained that e-Government includes:
1) e-Administration
To improve the governance process by saving costs, by managing performance, by building strategic connections within the government itself, and by creating empowerment.
2) e-Citizen & e-Services
Connecting citizens with the government by talking with citizens and supporting accountability, by listening to the community and supporting democracy, and by improving public services.
3) e-Society
Building interactions outside the government by working better with the business, by developing the community, by building cooperation with the government, and by building civil society.

As a developing country, Indonesia has tried to respond to new technological advances by implementing e-government programs. The government policy, among others, is set forth in the form of Presidential Instruction No.3 of 2003 and the decision of the Minister of Communication and information on the development of e-Gov which is a manifestation of the government's desire to push the Indonesian nation towards a Knowledge-based Society.

Technology acceptance is the main focus of TAM as the final target for the model and the effect of perceived usefulness and ease of use on personal intentions to use technology. The UTAUT theory [Venkatesh, 5] brings together eight models and considers that business expectations, performance expectations and social influences influence behavioral intentions, while facilitating conditions influences the actual use of technology.

E-Government can be interpreted as a new (modern) interaction mechanism between the government and the community and other stakeholders (stakeholders); which involves the use of information technology (especially the internet); with the aim of improving the quality (quality) of public services. The main function of e-Government is a tool in creating change in government services to the public [3]

1.2. Problem Formulation
Formulation of the problem in this study, namely:
1. What factors influence e-government adoption from a citizen perspective?
2. How much is the performance contribution that has used e-government from the public trust perspective.much contribution has influenced e-government adoption in Indonesia?

1.3. Research Objectives
1. Identify the factors that influence e-government adoption from the perspective of citizens.
2. Measuring the amount of contribution that uses e-government adoption that is adjusted to the public's trust.

2. Methode
2.1 Research Methods
In this study the object population of this study is a company that uses e-government in Medan City. The sampling technique uses the Probability sampling method with a sampling method with simple random sampling. . This simple random sampling method is used if the representativeness factor (refresentiveness) by the sample on the population is needed in research, among others, so that the results of the research can be generalized widely, or each element of the population has the same opportunity or opportunity to be selected as a sample member [13]

2.2 Definition of E-Government
The concept of e-Government is described in various ways by each individual or community. This can be seen from the various definitions below regarding e-gov in various countries according to the point of view of their governance system:

a. United States of America

The United States Federal Government defines e-Government in a concise, concise and clear manner, as: E-Government refers to the delivery of online government information and services through the internet or other digital media.

While Nevada, one of the states in the United States, defines e-Government as: Online services eliminate traditional barriers to provide easy access to communities and businesses in using government services. Government operations for the internal constitution can be simplified by operating requests for all government agencies and their employees.

b. New Zealand

The New Zealand Government looks at e-Government as follows: E-Government is a way for the government to use a new technology to serve the community by providing ease of access for the government in terms of services and information and also to increase the quality of services and provide opportunities to participate in the process and democratic institutions.

c. Italy

The Italian state defines e-Government, as: The use of modern information and communication technology (ICT) in state administration, through applications:

1. Computerized design for additional operational efficiency with each individual department and division.

2. Computerized services for communities and companies, often implementing service integration in different departments and divisions.

3. Determination of ICT access for end users from government information services.

d. ADB

Meanwhile Clay G. Wescott (Senior Officer of the Asian Development Bank), defines it as: The use of information and communication technology (ICT) to promote more efficient governance and effective cost emphasis, ease of government service facilities and provide access to information for the general public, and make the government more accountable to the community

2.3 Adoption Theories and Models

An important condition for the successful implementation of the system is individual acceptance of new innovations. Acceptance of technology users is related to "the initial decisions made by individuals to interact with technology" [Venkatesh, 6]. In the field of e-government research, there is no comprehensive model that includes prominent variables, and refers to cross-cultural aspects related to the adoption of citizens from the government. One of the objectives of this research is to review various theories and models from various fields of research, including psychology, sociology, and technology acceptance and motivational aspects in order to build a conceptual model of adoption of e-government.

A. PC Utilization Model (MPCU)

Personal behavior and computer utilization predictions, rather than intentions to be used, are considered by Thompson et al. [7] which are largely based on Triandis human behavior theory [8]. Thompson et al. [7] try to predict personal acceptance and behavior to use information technology in a model consisting of six components.
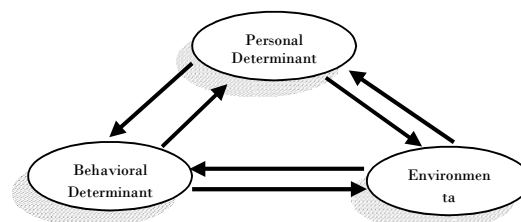

Figure 1. Social cognitive theory [9]

B. Social Cognitive Theory (SCT)

One of the most powerful theories in human social behavior is Bandura's Cognitive Theory [9], which examines the relationship between personal beliefs and their effects on human behavior, on the basis of what people think, believe, and feel influences how they behave (ibid).

C. Diffusion of Innovation Theory (DOI)

One popular sociology model is Diffusion of Innovation Theory, which is used in a number of innovations to evaluate the spread of its users. The innovation adoption process was described [10] as "the process by which organizations pass from the first knowledge of innovation, to shape attitudes towards innovation, to the decision to adopt or reject, for implementation of new ideas", and that the awareness of the characteristics of an innovation has an impact on individual intention to use technology [10]

D. Technology Acceptance Model (TAM)

Developed a Technology Acceptance Model, designed to predict the acceptance of software technology by employees of an organization [11]. This model is based on the psychological theory of reasoned action (TRA) [12], which states that belief influences intentions and intentions to influence actions. Individual attitudes are the focus of TAM, and the focus is on personal intentions to use, as well as the actual use of technology.

E. The theory of acceptance and use of integrated technology (UTAUT)

A comprehensive model that is synthesized, the Unified Theory of Acceptance and the Use of Technology model (UTAUT), proposed [6]. Eight models that consider technology and human behavior are combined into integrated models to explain 70% of the use of variance technology. The models incorporated in the UTAUT which have been discussed in detail in the previous section are the Social Cognitive Theory (SCT) [9];
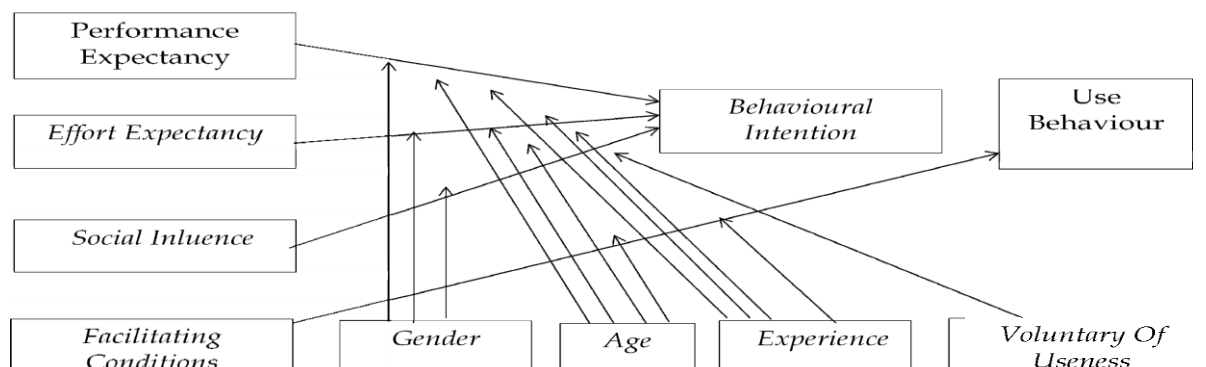
Figure 2. The theory of acceptance and use of integrated technology
Resource: Venkatesh et all [7]

3. Results and Discussion
3.1 Research Location
The object in this study were e-government users in the surrounding Medan City.

3.2 Research Methods
In this study the object population of this study is a company that uses e-government in Medan City. The sampling technique uses the Probability sampling method with a sampling method with simple random sampling. . This simple random sampling method is used if the representativeness factor (refresentiveness) by the sample on the population is needed in research, among others, so that the

results of the research can be generalized widely, or each element of the population has the same opportunity or opportunity to be selected as a sample member [13]

3.3 Factor analysis

An instrument or questionnaire is declared valid or considered to meet the requirements, if the price of the r_ (count) coefficient is> 0.300 [14]. If the measuring instrument has been declared valid, then the reliability of the measuring instrument is tested. According [14] the value of Cronbach alpha can be received > 0.600. in research, the reliability measurement technique used was the Cronbach technique. Validity and reliability testing is done with the help of SPSS data processing.

Table 1. Validity and Reliability Item-Total Statistic

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
VAR00001	1.056.429	540.093	.517	.747
VAR00002	1.062.857	532.835	.836	.741
VAR00003	1.064.286	533.341	.560	.743
VAR00004	1.058.571	550.440	.484	.753
VAR00005	1.062.143	547.104	.425	.750
VAR00006	1.065.000	541.962	.463	.748
VAR00007	1.068.571	515.363	.798	.733
VAR00008	1.067.857	531.104	.647	.742

Reliability Statistics

Cronbach's Alpha	N of Items
.756	8

Resource : Data Processing (2018)

Table 2. Intention to Use Behavior (Summary Model).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.836	.851	.805	.004	.251	8.506	7	469	.000

Resource : Data Processing (2018)

ANOVA test results (1) confirm the suitability of the best model, which can predict better results than using the average with an increase ratio achieved F = 8,506 and a significant value of 0,000 (p <.05). The relationship between the dependent variable, the intention to use the e-government system, and the independent variable is shown through the β value and the significance of the T-test. The expectation performance proved to be significantly correlated with the intention to use e-government with a value of β equal to 0.273 and with a significant value of 0.000 (p <0.05).

Table 3. Correlations for intension to use factors

		Performance expectations	Business expectations	Suitability	Social influence	Government trust	Trust the internet	e-Government trust	Plan depends
						Correlation			
Performance expectations	Pearson Correla	1	.276	.408	.100	.173	.171	.155	.253
	Sig. (2- tailed)		.000	.000	.029	.000	.000	.001	.000
Business expectations	Pearson Correla	.276	1	.458	.280	.288	.246	.245	.160
	Sig. (2- tailed)	.000		.000	.000	.000	.000	.000	.000
Suitability	Pearson Correla	.408	.458	1	.106	.185	.123	.074	.140
	Sig. (2- tailed)	.000	.000		.020	.000	.007	.108	.002
Social influence	Pearson Correla	.100	.280	.106	1	.126	.048	.184	.049
	Sig. (2- tailed)	.029	.000	.020		.006	.295	.000	.285
e-Government trust	Pearson Correla	.173	.288	.185	.126	1	.509	.157	.156
	Sig. (2- tailed)	.000	.000	.000	.006		.000	.001	.001
Trust the internet	Pearson Correla	.171	.246	.123	.048	.509	1	.195	.225
	Sig. (2- tailed)	.000	.000	.007	.295	.000		.000	.000
Trust e-government	Pearson Correla	.155	.245	.074	.184	.157	.195	1	.175
	Sig. (2- tailed)	.001	.000	.108	.000	.001	.000		.000
Plan depends	Pearson Correla	.253	.160	.140	.049	.156	.225	.175	1
	Sig. (2- tailed)	.000	.000	.002	.285	.001	.000	.000	

Resource : Data Processing (2018)

Independent variables, such as compatibility, business expectations, trust from government and system awareness have a significant correlation with the dependent variable, performance expectations and trust from the Internet which reduces the correlation shown in the regression model. This shows that citizens consider the ease of using the system, the compatibility of the system with their lifestyle, culture and tradition as a system benefit. In addition, users may consider government trust before internet trust, because e-government is the only method available to contact government agencies.

Usage behavior is the second dependent variable that is suggested to correlate with intention to use, computer self-efficacy, availability of resources and service quality as independent variables. A multiple regression test reveals that the independent variable model explains about 85 percent of the variance in the dependent variable with R-square of 0.851 and whose results make a significant contribution.).

Table 4. : Regression analysis coefficients for intension to use behaviour.

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
Model	B	Std. Error	Beta			Zero- order	Partial	Part	Tolerace	VIF
1 (Constanta)	2.479	.312		7.933	.000					
Performance	.273	.069	.193	3.984	.000	.653	.181	.173	.803	1.245
Suitability	.028	.043	.034	.647	.001	.160	.030	.028	.671	1.490
Business expectations	.013	.045	.015	.280	.001	.140	.013	.012	.697	1.434
Plan depends	-.003	.028	-.005	-.112	.009	.049	-.005	-.005	.901	1.110
Social influence	-.039	.029	.064	1.381	.008	.141	.064	.060	.894	1.118
Trust the internet	.024	.044	.035	.276	.000	.140	.013	.012	.667	1.424
e-government awareness	.018	.033	.029	.553	.000	.172	.026	.024	.709	1.410

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Resource : Data Processing (2018)

Business expectations, suitability, trust from the government and awareness of the Internet system proved to correlate significantly with the dependent variable with a positive β value of 0.028; 0.013; 0.018 and 0.108 and significant values below 0.05 ($p < 0.05$). Other variables such as dependent plans and social influences have no significant correlation between dependent variables (intention to use) and other independent variables, such as business expectations, internet system awareness, and government trust (regression coefficients Table: 4). The results show that citizens' trust in benefiting from using e-government applications and their confidence in using Internet services will encourage citizens to use e-government services in the future.

The use of simple correlations between each independent variable and the dependent variable helps in understanding the relationship between variables. Further analysis is therefore conducted to investigate significant and insignificant correlations between dependent variables (intention to use e-government) and independent variables (business expectations, compatibility, social influence, government trust and system awareness). The moderate correlation between expectations of performance and suitability is shown by Pearson correlation, which is 0.408 with a significant value ($p < .05$). The moderate correlation between business expectations and suitability by Pearson correlation is 0.458, with a significant value ($p < 0.05$). The high correlation between government trust in performance by Pearson correlation is 0.373 with a significant value ($p < 0.05$). On the other hand, Pearson correlation between government trust and trust from Internet accounts was 0.509 with Pearson correlation, with significant values ($p < .05$). The indirect relationship between dependent and independent variables is predicted by this moderate correlation through other independent variables.

To state the size of the contribution of the dependent variable to the independent variable or determinant coefficient $= r^2 \times 100\%$ or $\llbracket 0.653 \rrbracket ^2 \times 100\% = 42.64\%$ while the remaining 57.36% is determined by other variables.

4. Conclusions

4.1 Conclusion

1. Factors affecting e-government are people's trust in the face of the Internet, having a significant impact on citizens' behavioral intentions when adopting e-government. There is an indirect relationship between compatibility factors and the intention to use e-government through performance expectations. Social influences predict the intention to use behavior using moderating variables, namely the level of education and Internet experience. Those who have a higher level of education and more experience experience negative social influences on intention.

2. The findings of the descriptive study revealed that around 50.9% of participants knew of the e-government program, while 49.1% were unaware of the concept. Empirical research reveals that participants found that mass media channels and government institutions are more important factors in learning about e-government than browsing the Internet and interpersonal communication. Research findings revealed that 50.9% of participants had used e-government systems, and only 49.1% had never used the previous system.

4.2 Suggestions

1. Need to be considered The e-government adoption process to emphasize the need to focus on the citizens' (G2C) perspective which is often overlooked.

2. Subsequent research for populations and samples so that not most young people, educated users and the internet, because the goal has overcome the challenges of lack of private postal address services, wide area coverage and gender segregation to include heterogeneous sample groups.

5. REFERENCES

[1]   World Bank. (2003). **World Development Report:** Making Services Work for Poor People. Washington, DC: World Bank and Oxford University Press.

[2]   Stiftung, B. (2002). **Balanced E-Government: E-Government – Connecting Efficient Administration and Responsive Democracy**. A study by the Bertelsmann Foundation.

[3]   World Fact Book (2003). **The Central Intelligence Agency** (CIA) library, Saudi Arabia, [online], available from https://www.cia.gov/library/publications/the-world-factbook/geos/sa.html [Accessed on 15 OCT 2011].

[4]   Heeks, R. (2001) Understanding e-Government for development, I-Government Working Paper Series, Paper No.11, **Institute for Development Policy and Management,** University of Manchester.

[5]   Venkatesh, V., and Davis, F. D. (2000). A theoretical extension of the technology acceptance model (four longitudinal field studies). **Management Science,** 46(2), 186– 204.

[6]   Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D. (2003). User acceptance of infroamtion technology: Toward a unified view. **MIS Quarterly,** 27(3), 425–478.

[7]   Thompson, R. L., Higgins, C. A., and Howell, J. M. (1991). Personal computing: Toward a conceptual model of utilization. **MIS Quarterly**, 15(1), 124–143.

[8]   Triandis, H. C. (1971). **Attitude and Attitude Change**. NY: John Wiley. Triandis, H. C. *(1977)* **Interpersonal Behavior***,* Brooke/Cole, Monterey, CA. Trist E.L. and Bamforth K.W. (1951) Some social and psychological consequences of the longwall methods of coal-getting. **Human Relations**, 14, 3-38.

[9]   Bandura, A. (1986). **Social foundations of thought and action: A social cognitive theory**. Englewood Cliffs, NJ: Prentice Hall.

[10]   Rogers, E. M. (1995). **Diffusion of innovations** (4th ed.). New York, NY: The Free Press. Rogers, E. M. (2003). **Diffusion of innovation** (5th ed.). New York: Free Press

[11]   Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. **Management Science**, 35(8), 982–1002.

[12]   Fishbein, M., & Ajzen, I. (1975). **Belief, attitude, intention and behavior**: An introduction to theory and research Reading. Massachusetts: Anddision-Wesley.

[13]   Sukaria Sinulingga, (2013), Metode Penelitian, Edisi ke 3, USU Press, Medan