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Analysis of Citizens Acceptance for e-Government Services in Bandung, Indonesia: The Use of the Unified Theory of Acceptance and Use of Technology (UTAUT) Model

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Article Info	ABSTRACT
	At present, the use of ICT is growing very rapidly. This has led to changes in processes, functions, and policies in various sectors, including the public service sector managed by the government. e-Government is a new mechanism between the government and the community and stakeholders, which involves the implementation of information technology, and aims to improve the quality (quality) of public services. Bandung City is one of the cities that is very intensive in developing the use of ICT in implementing e-Government. The focus of the city government of Bandung is the Government to Citizen (G2C) application model. The application that is still lacking in use is the e-punten application. One important factor for the success of e-Government services is the acceptance and willingness of people to use e-Government services. E-punten application services provided by the Bandung city government will not run perfectly if no people are using it. To assess what factors influence the use of e-punten applications in the city of Bandung, the UTAUT model is used. To analyze the factors that influence the acceptance of e-punten applications SEM analysis is used. In this study, the PLS-SEM approach is used to solve multiple regression when specific problems occur in the data, such as the small sample size of the study. The PLS evaluation is carried out by evaluating the measurement model and the structural model that best suits the UTAUT model. Factors that influence the use of epunten applications are effort expectancy for behavioral intention, facilitating conditions for use behavior, and behavioral intention for use behavior. The factors that have the most influence are performance expectancy and effort expectancy.

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1.   INTRODUCTION

At present, the use of Information, Communication, and Technology (ICT) are developing very rapidly. The use of ICT has a very significant positive impact on society in Indonesia. This has led to changes in processes, functions, and policies in various sectors, including the public service sector managed by the government. Changes in the public service sector are marked by the development of electronic government or commonly referred to as e-Government. e-Government is a new mechanism between the government and the community and other stakeholders, which

involves the implementation of information technology, and aims to improve the quality (quality) of public services [1]–[3].

Bandung City is one of the cities that is very intensive in developing the use of ICT in implementing e-Government. In the Bandung City Diskominfo, Strategy Plan explains that the importance of the role of ICT in realizing better governance and public services in order to realize the mission of the city of Bandung is to deliver effective, clean, and serving governance. There are several models of e-Government applications in the city of Bandung, but what is currently the focus of the Bandung city government is the Government to Citizen (G2C) application model. Some examples of G2C applications used in the city of Bandung are the Hayu, Gampil, and e-punten applications. Of the three applications that are still lacking in use are e-punten applications. This is also shown by the responses of users of the e-punten application compared to the Gampil application on the website play.google.com or playstore which shows more negative responses than positive responses on the e-punten application. Until now, temporary residents' data in the city of Bandung, are still obtained manually by the local village.

One important factor for the success of e-government services is the acceptance and willingness of the community to adopt or use e-Government services [4]. The success of the government in implementing e-government systems on the website can be known as one of them from the active role of the community in using the facilities provided by the government [1], [5], [6]. High or low participation of citizens while adopting e-punten applications, of course, is influenced by certain factors. To assess what factors influence the use of e-punten applications in Bandung, the Unified Theory of Acceptance and Use of Technology (UTAUT) model is used. UTAUT model is a model that is combined from eight models that have been proposed [7]. The UTAUT can explain the intention to use technology in up to 70% of existing cases compared to eight previous technology acceptance models, this opinion is supported by research by Oshlyansky *et al.* [8] suggested that UTAUT was quite strong (robust) even though it was translated into various languages and could be used across cultures.

To analyze the factors that influence the acceptance of e-punten applications Structural Equation Modeling (SEM) analysis is used. SEM has a different approach, the first approach is covariance-based SEM (CB-SEM), the second approach is component-based SEM or known as Generalized Structured Component Analysis, the third approach is Partial Least Squares (PLS) which focuses analysis of variance. In this study the Partial Least Square - Structural Equation Modeling (PLS-SEM) approach is used to solve multiple regression when specific problems occur in the data, such as the small sample size of the study. PLS evaluation is done by evaluating the measurement model (outer model) and structural model (inner model) that best suits the UTAUT model [8]. The existence of this research is expected to help the development of e-punten applications in Bandung. So that the city government of Bandung can realize better governance and public services in order to realize the mission of the city government of Bandung which is to present effective, clean and serving governance.

2. LITERATURE REVIEW
2.1. Electronic Government

e-Government is a new mechanism between the government and the community and other stakeholders, which involves the implementation of information technology, with the aim to aim to improve the quality (quality) of public services [2]. The Indonesian government has established Presidential Regulation number 3 of 2003 concerning e-Government policies and development strategies in Indonesia.

In 2004 the Ministry of Communication and Information issued 6 guidelines consisting of:
a. Quality standards and service coverage, as well as e-service application development.
b. Institutionalization, authority, information, and business involvement in e-Government development.
c. Development of good governance and change management.

    d.   Implementation of e-Government projects and budgeting.

    e.   E-Government manager competency standards.

    f.   Blueprint e-Government application for central and local governments.

    g.   E-Government has four types of relations, which are: a. Government to Citizens (G2C)

    h.   Government to Business (G2B)

    i.   Government to Government (G2G)

    j.   Government to Employee (G2E)

Public acceptance and willingness to adopt e-Government services is one of the important factors for the success of these services [4]. If there is no participation from the public in adopting eGovernment services, then e-Government services will not function and their existence will be in vain. High or low community participation in adopting e-Government, of course influenced by certain factors.

2.2. Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT is an amalgamation of eight technological acceptance models by Venkatesh *et al.* [7] . UTAUT formulates four main variables, namely performance expectancy, effort expectancy, social influence, and facilitating conditions. which is said to be an exogenous variable. Two behavioral intention variables and use behavior as endogenous variables. UTAUT is one of the most important acceptance theories because it can predict the acceptance of information technology around 70% of the cases. Compared with the Technology Acceptance Model (TAM), it can only predict the acceptance of information technology around 40% of cases that have been studied by previous researchers. Besides, UTAUT can link exogenous variables with behavioral intention and use behavior.

The construct is a UTAUT construct that has been modified in such a way as to make it simpler. This scale includes six aspects, namely performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC), behavioral intention (BI), and use behavior (UB). The statement valuation model uses a Likert scale consisting of five alternative answers that are scored from 1 to 5. The classification of the answers is Strongly Disagree (STS), Disagree (TS), Neutral (N), Agree (S), Strongly Agree (SS).

2.3. Structural Equation Modeling - Partial Least Square (SEM-PLS)

Partial Least Square Analysis (PLS) is a multivariate statistical technique that makes comparisons between multiple dependent variables and multiple independent variables [9], [10]. PLS is a variant-based SEM method that is designed to solve multiple regressions when specific problems occur in data such as small sample sizes. The purpose of PLS is to predict the effect of variable X on Y and explain the theoretical relationship between the two variables [11]–[13]. In SEM there are two submodels namely the inner model to look for specific relationships between free and bound latent variables, while the outer model determines the relationship between the latent variable and the observed indicator.

2.4. SmartPLS

SmartPLS is a statistical software for SEM method. SmartPLS software is open source using an academic account. SmartPLS provides a menu for drawing SEM models, making it easier to use without having to write code like other software. SmartPLS is used to observe and calculate the UTAUT model with the SEM-PLS method previously described

Explaining research chronological, including research design, research procedure (in the form of algorithms, Pseudocode, or other), how to test and data acquisition [7]. The description of the course of research should be supported references, so the explanation can be accepted scientifically [3], [4], [7]. Tables and Figures are presented center, as shown in Table 1 and Figure 1, and cited in the manuscript and should appear before it.

3. RESEARCH METHOD

In this study there are 3 stages of research, the first stage is initiation, namely the stage to make preparations to conduct research. The second stage is the collection and processing of data, the stage for collecting and processing the data obtained starting from the determination of the hypothesis to the validity and reliability testing. The third stage is analysis, which is the stage for analyzing the results of data processing obtained from the results of the validity and reliability tests with the final results of the factors that influence the use of e-punten applications.

4. RESULTS AND DISCUSSION

4.1. Evaluation of Measurement Model (Outer Model)

The SEM-PLS evaluation in the measurement model (outer model) is evaluated by looking at validity and reliability. Following are the evaluation results of the measurement model:

Table 1. Evaluation of Measurement Models

Indicator	Convergent Validity	Discriminant Validity	Reliability	Information
BI1	Accepted	Accepted	Accepted	Used
BI2	Accepted	Accepted		Used
BI3	Accepted	Accepted		Used
EE1	Accepted	Accepted	Not Accepted	Used
EE2	Not Accepted	Not Accepted		Eliminated
EE3	Not Accepted	Not Accepted		Eliminated
EE4	Not Accepted	Accepted		Eliminated
FC1	Not Accepted	Not Accepted	Not Accepted	Eliminated
FC2	Not Accepted	Accepted		Eliminated
FC3	Not Accepted	Not Accepted		Eliminated
FC4	Accepted	Accepted		Used
PE1	Accepted	Accepted	Accepted	Used
PE2	Accepted	Accepted		Used
PE3	Accepted	Accepted		Used
PE4	Not Accepted	Accepted		Used
SI1	Accepted	Accepted	Not Accepted	Used
SI2	Not Accepted	Not Accepted		Eliminated
SI3	Not Accepted	Not Accepted		Eliminated
SI4	Not Accepted	Not Accepted		Eliminated
UB1	Accepted	Accepted	Not Accepted	Used
UB2	Not Accepted	Accepted		Eliminated
UB3	Not Accepted	Not Accepted		Eliminated

Based on the table above, indicators that must be eliminated are: EE2, EE3, EE4, FC1, FC2, FC3, SI2, SI3, SI4, UB2, and UB3. Indicators that do not meet the validity and reliability tests must be eliminated in order to proceed with the calculation phase of the structural model evaluation.

4.2. Evaluation of Structural Models

a. Bootstrapping

Bootstrapping is used to test the hypothesis of the direct effect of an exogenous variable on an endogenous variable. In this study a sample of 39 data samples, resampling will be done up to 500 cases. Subsequent test results will be analyzed by looking at the p-value obtained. If the p-value <0.05, the stated variables tested have a significant effect on endogenous variables. Meanwhile, if the p-value > 0.05, it is stated that the tested variable has no significant effect on the variable. Furthermore, the direction of the relationship of the influence of exogenous variables on endogenous variables can be seen from the original sample values. The original positive sample shows the direction of a positive / unidirectional relationship while the negative one indicates the opposite

direction of the relationship. Here is the image of the bootstrapping processing. The following is the result of bootstrapping processing:

Table 2. Bootstrapping

	Original Sample	T-Statistics	P-Values
Performance Expectancy → Behavioural Intention	-0.452	1.715	0.024
Effort Expectancy → Behavioural Intention	0,327777778	3.524	0.000
Social Influence → Behavioural Intention	-0.327	2.285	0,409027778
Facilitating Condition → Use Behaviour	0.084	0,375	0.087
Behavioural Intention → Use Behaviour	0,230555556	2.268	0.023

Based on Table 2 above, the following hypothetical analysis results are obtained:

H1 Performance Expectancy has a positive effect on Behavioral Intention.

The p-value of the performance expectancy variable towards behavioral intention is 0.024 with a positive statistic of 1.715 and the original sample is -0.452. this shows that the performance expectancy variable has a negative but significant effect on behavioral intention. The higher the performance expectancy, the lower the behavioral intention. Thus H1 was rejected.

H2 Effort Expectancy has a positive effect on Behavioral Intention.

The p-value of the effort expectancy variable on behavioral intention is 0,000 with a positive t-statistic of 2,285 and the original sample is 0.472. this shows that the effort expectancy variable has a positive and significant effect on behavioral intention. The higher the effort expectancy, the higher the behavioral intention. Thus H2 is received.

H3 Social Influence has a positive effect on Behavioral Intention.

The p-value of the effort expectancy variable towards behavioral intention is 0.589 with a positive t-statistic of 3.524 and the original sample of -0.327. this shows that the effort expectancy variable has a negative and not significant effect on behavioral intention. The higher the effort expectancy, the lower the behavioral intention. Thus H3 is rejected. H4 Facilitating Conditions has a positive effect on Use behavior.

The p-value of the facilitating condition variable on use behavior is 0.087 with a positive t-statistic of 0.540 and an original sample of 0.084. this shows that the facilitating condition variable has a positive but not significant effect on use behavior. The higher the facilitating condition, the higher the use behavior. Thus H4 is accepted.

H5 Behavioral Intention has a positive effect on Use Behavior.

The p-value of the behavioral intention variable on use behavior is 0.023 with a positive t-statistic of 2.268 and the original sample of 0.332. this shows that the behavioral intention variable has a positive but significant effect on use behavior. The higher the behavioral intention, the higher the use behavior. Thus H5 is accepted.

 b. R-Square

R-Square is a measure of the proportion of endogenous variable variations that can be explained by exogenous variables. R-Square is used to predict the merits of the model. In SEM-PLS if there is more than one endogenous variable then the value on the R-Square adjusted is used. R-Square measurement has the following criteria: 1) if the value of R-Square = 0.75 then the path model is substantial (Strong), 2) if the value of R-Square = 0.50 then the path model is moderate (Medium), 3) if the value of R-Square = 0.25 then the path model is weak (Bad). Following is the calculation of the value of R-Square:

Table 3. *R-Square*

	R-Square	R-Square Adjusted	Percentage
Behavioral Intention	0,432639	0,409722	59%
Use Behavior	0,095139	0.090	9%

Based on Table 3 above, the R-Square Adjusted variable Behavioral Intention is 0.580, while the use behavior variable is 0.090. This means that the variable performance expectancy, effort expectancy, and social influence in explaining behavioral intention is 59%, thus the path model is moderate. While behavioral intention and facilitating condition variables are only able to explain the use behavior by only 9%, thus the path model is relatively weak.

    c. F-Square

F-Square is a measure used to assess the relative impact of an influencing variable (exogenous) on a variable that is affected (endogenous). Changes in the R-Square value when certain exogenous variables are omitted from the model, can be used to evaluate the eliminated variable that has a strong impact on the endogenous construct. F-Square has the following criteria: 1) if the value of F-Square = 0.02 then it has a small effect of exogenous variables on endogenous variables, 2) if the value of F-Square = 0.15 then it has a moderate effect of exogenous variables on endogenous variables, 3) if the value of F-Square = 0.35 it has a large effect of the exogenous variables on endogenous variables. Following is the F-Square calculation table.

Tabel 4. *F-Square*

	Performance Expectancy	Effort Expectancy	Social Influence	Facilitating Condition	Behavioural Intention	Use Behaviour
Performance Expectancy					0,3375	
Effort Expectancy					0,294444	
Social Influence					0,13125	
Facilitating Condition						0,077778
Behavioural Intention						0.007
Use Behaviour						

Based on Table 4 above it can be concluded as follows:
1. The performance expectancy variable has a large effect on the behavioral intention variable with an F-Square value of 0.486.
2. The effort expectancy variable has a large effect on the behavioral intention variable with a value of F-Square 0.424.
3. The social influence variable has a moderate effect on the behavioral intention variable with a F-Square value of 0.189.
4. The performance expectancy variable has a small effect on behavioral intention variables with an F-Square value of 0.112.
5. The performance expectancy variable has a small effect on behavioral intention variables with an F-Square value of 0.007.

5. CONCLUSION

The majority of respondents who have used e-Government in Bandung City are students/employees and employees aged 20 to 24 years. From the formulation of the problem, the purpose of the study, and the results of the analysis, it can be concluded that:
1. From the results of testing the hypothesis at the bootstrapping stage that the factors that influence the use of e-punten applications directly are effort expectancy on behavioral intention, facilitating conditions on use behavior, and behavioral intention on use behavior. The higher the business expectations of e-punten application users, the higher the intention to use e-punten applications. Similarly, the facilitating conditions for the intention to use and the intention to use the behavior of using e-punten applications.

2. Based on the results of R-Square and F-Square calculations, the factors that have the greatest influence on exogenous variables are performance expectancy and effort expectancy. Then the biggest influence of endogenous variables is behavioral intention.

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