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Innovation in the Public Sector:

The effectiveness of "LAPOR!" as one of the Smart City Programs in Bandung

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***Abstract*—Many cities in Indonesia try to develop and design effective strategies to create smart cities through innovation and technology. Bandung is one of the local governments in Indonesia which is known as the pioneer of smart city in Indonesia. The Bandung City Government has succeeded in developing innovative solutions to the quality of services in the public sector that are expected to be able to overcome the problems in the Bandung city so as to provide the best service to the societies effectively and efficiently, one of them by launching the application "LAPOR!". This study aims to identify society's acceptance and the factors that influence the implementation of LAPOR! as one of the smart city programs in Bandung City with the UTAUT theory approach. The research method used is a quantitative method, with a survey approach. The sampling technique used in this research is probability sampling with random sampling technique. A total of 400 respondents participated in filling out the questionnaire. Multiple linear regressions are used to test the proposed hypothesis. Based on the test results, it can be concluded that all the hypotheses proposed in this study are proven where Performance Expectancy, Effort Expectancy, Social Influence, facilitating conditions have a significant and positive effect on the LAPOR's behavioral intention.**

***Keywords*— Bandung; innovation; LAPOR!; public sector; smart cities; UTAUT**

I. INTRODUCTION

The rapid development of information and communication technology has encouraged the government to innovate the public sector by integrating the use of technology and increasing services to the community. Global competition and the era of openness lead to rapid dynamics of change, so that innovation has become a necessity in various sectors, especially the public service sector [1]. Innovation will direct the organization to survive and win the competition not only in business/private sector but also in the public sector [2]. One form of public sector innovation related to the use of technology is the application of smart city. "Reference [3], defines smart cities as urban innovations that utilize information and communication technology to improve people's quality of life, efficiency of public service costs, city competitiveness, and ensure the fulfillment of the society needs both today and future in the aspects of economic, social and environmental." Smart city, as an innovation in the public sector, through the use of technology can be a solution to various problems faced by the government regarding public services [3].

At present, many countries in the world have implemented the smart city concept. In 2015, The IESE Business School launched an index called Cities in Motion Index (CIMI). CIMI is a smart city ranking index worldwide based on the criteria of technology, economy, public management, and the ability to attract talent from around the world. Based on CIMI data, there are 20 smart cities in 55 countries with the top 10 ranking are Tokyo, London, New York, Zurich, Paris, Geneva, Basel, Osaka, Seoul and Oslo [4]. Meanwhile, based on IBM data, the two main cities of smart cities with two different pilot focuses are Copenhagen, Denmark as a city that has succeeded in focusing on the environment, and Seoul, South Korea as a city that has a focus on public services in information technology [5].

The smart city concept in Indonesia was launched through the Indonesian Smart City Index (IKCI) program initiated by the Indonesian Vice President, Jusuf Kalla, and was initiated by the Bandung Institute of Technology, Kompas Daily, and the National Gas Company. The program aims to measure and rank the performance of city management based on digital technology on community service [6]. The Indonesian government seeks to implement smart cities throughout Indonesia, but the application of the smart city concept in each city has a different background that is adjusted to the characteristics and problems of each city [7].

Based on the IKCI survey in 2017, Bandung City is one of the 15 cities that implement the best smart city in Indonesia.

The smart city application in the city of Bandung is known as Bandung Smart City (BSC). In planning the implementation of BSC, there are four basic frameworks that were built as pillars of BSC, including, public services, improved apparatus performance, increasing community interaction with the Bandung City government, and open access to data [6]. The seriousness of the Bandung City Government in implementing BSC is shown by the establishment of the Bandung Smart City Development Board or the Smart City Council which consists of various elements consisting of government, business, academia, and community. In implementing smart city, the Bandung City Government has an important role in the development and implementation of funding investments. Figure 1 below is 10 priority areas of BSC [8].

Fig. 1. Priority areas – bandung smart city.

Smart government as one of the basic elements that must be fulfilled to realize smart city. The Bandung City Government seeks to solve urban problems with creative solutions through the use of information and communication technology. Some of the programs carried out on the smart government priority areas in Bandung are, *Sabilulungan* (Social Assistance and Online Grants), BIRMS (Bandung Integrated Resources Management System), Bandung Licensing Services Online (HAY.U Bandung), Cloud Computing (E-Kelurahan), Bandung Command Center, Online Aspiration and Complaint Service (LAPOR System), Assessment Information System, Electronic Procurement Service, Public Information, and Government Institution Performance Accountability System [1].

One of the implementations of smart government conducted by the Bandung City Government is the LAPOR application, which is the first service system for delivering social aspirations and complaints online based on the principle that is easy, integrated and complete for monitoring development programs and public services. The application was launched in 2013 managed by the Presidential Work Unit for Development Supervision and Control (UKP4). However, the application of LAPOR has not been adopted evenly by the entire of Bandung city. This is caused by various factors including lack of socialization, lack of knowledge of some people about technology and knowledge about the benefits of LAPOR applications, as well as supporting devices that have not been partially owned by the community, making it difficult for people to adopt the application. According to Sutrisno [9], community participation in adopting BSC is still lacking, this is because not all people have knowledge of technology and do not have device support, especially for the elderly and those who are in the pre-prosperous category. Based on the above phenomenon, this study aims to determine the implementation of the LAPOR in the application of smart government in the city of Bandung with a modified UTAUT model approach.

A. *Smart City*

Smart city is a city that is anticipatively able to manage resources in an innovative and competitive manner, with technological support in order to create a comfortable and sustainable city [10]. Smart cities are considered learning cities because they build a knowledge workforce that focuses on innovation. This means that smart cities focus on groups and networks as part of their competitiveness because people learn to be near other knowledge-based industries [11]. Meanwhile, Nadapdap et al. [12] revealed that smart city can be described as the concept of developing, implementing, and implementing technology for geographical areas, especially in urban areas, because it is a complex interaction between various systems within the region. Smart city includes 3 main dimensions: people, technology, and community. One important aspect of smart city emphasizes the planning and control of all cities through the use of information and communication technology (ICT), digital systems, which enable us to collect and retrieve data from heterogeneous sources such as sewer systems, parking lots, security cameras, and traffic lights.

B. *Public Sector Innovation*

Innovation in the public sector is very important in responding to social and technological challenges effectively and increasing public service expectations [2]. Innovation can play a role in strengthening the reputation and image of the government in public services [13]. Innovation can also bring changes in public service governance, by increasing the level of accountability and transparency, performance, or level of user involvement, and satisfaction [1]. OECD [14], defines "public sector innovation as 'implementation by public organizations of new or significantly improved operations or products', including content and services, and the instruments used to deliver them."

Innovation in the public sector has become one of the government's priorities as an activity in providing innovative services that integrate with the community [15]. Public sector innovation in the implementation of public services emerged because it was driven by technology. Therefore, the application of new ideas in the implementation of digital public services is intended to create better, more meaningful, useful, faster and value-added public services as individual service providers and at a broader level of organizational management [1].

C. *Technology Adoption Theory*

Kotler and Keller [16], defines adoption or acceptance as a person's decision to be a user of a product and is followed by a

consumer-loyalty process. The consumer-adoption process is the mental stage that is passed personally from first hearing about the product innovation to the final acceptance, which includes: awareness, interest, evaluation, trial and adoption. Khalil and Hosni [17], also states that technology, innovation, new ideas, and new systems will be successful if they are accepted by users and distributed to the user population.

Several studies have been carried out related to consumer adoption especially in the context of technology. There are several models and theories that can be used to identify the level of adoption and behavior of community use in their tendency to use information technology. There are many technology acceptance theories such as the TAM (Theory Acceptance Model), TRA (Theory of Reasoned Action), UTAUT (Unified Theory of Acceptance and Use of Technology), and there are several other theories [18-21].

One of the frequently used models of technology acceptance is UTAUT developed by Venkatesh et al. [21]. The UTAUT model is actually a synthesis or combination of elements contained in eight other leading technology acceptance models with the aim of obtaining a unified view of the user. The UTAUT model consists of 4 main variables namely Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Condition, and also consists of 4 additional variables or moderators, namely Gender, Age, Experience and Voluntariness of Use. According to Venkatesh et al. [22], based on existing publications, UTAUT is widely used by researchers as a basic model that is applied to research in various technologies both in organizational and non-organizational contexts.

II. Research Methods

The research method used in this study is quantitative research methods. The quantitative method is used to analyze the use of LAPOR with the UTAUT modification model approach in Bandung city society statistically and to test the hypotheses that have been formulated. The definition of the variable proposed in this study are Venkatesh et al. [21]: Expectancy performance is the extent to which an individual believes that using a system will help them to achieve profit in their work performance; Effort Expectancy is a level of ease in using the system; Social Influence is the extent to which an individual perceives that the importance of the presence of other people in using the new system will affect the individual in using the new system as well; and, Facilitating Condition is the extent to which an individual believes that organizational and technical infrastructure is present to support the use of the system.

The number of samples was determined based on Slovin formula with a margin of error of 5%. The sampling technique used in this study is probability sampling with random sampling. The primary data source in this study is the results of a questionnaire distributed to the people of Bandung. A total of 400 respondents participated in filling out the questionnaire. This research is descriptive where research is conducted to determine the value of each variable, either one or more variables without making a relationship or comparison with other variables [23]. In this study, the descriptive method was used to describe each good variable independent variable consisting of Performance Expectancy, Effort Expectancy, Social influence, and Facilitating Condition, as well as the dependent variable, Behavioral Intention. Meanwhile, data processing techniques use multiple linear tests to test the hypothesis proposed in this study. Before carrying out multiple linear tests, the method requires to test classic assumptions in order to get the best results. The results of classical assumption testing indicate that all variables have met the requirements. The purpose of fulfilling this classic assumption is that the independent variables as estimators of the dependent variable are not biased.

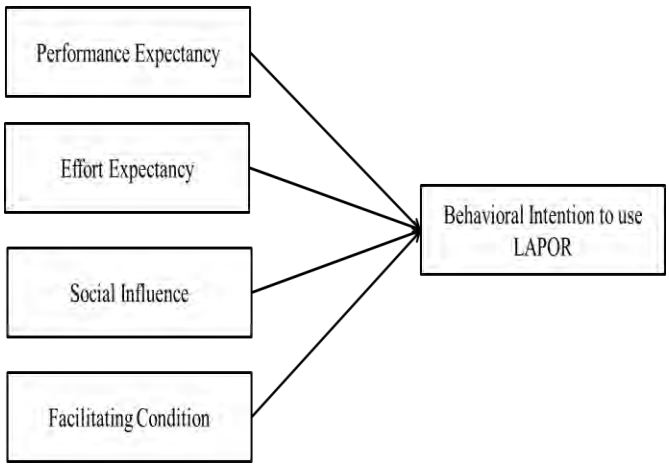

Fig. 2. Research model.

The hypotheses proposed in this study are:

- H1: Performance expectancy has a positive and significant effect on behavioral intention to use LAPOR.
- H2: Effort expectancy has a positive and significant effect on behavioral intention to use LAPOR.
- H3: Social influence has a positive and significant effect on behavioral intention to use LAPOR.
- H4: Facilitating condition has a positive and significant effect on behavioral intention to use LAPOR.

III. Results and Discussion

A. Profile of Respondents

This research data was obtained through a questionnaire distributed through Google forms using links or website addresses to the people of Bandung City. From the results of distributing online questionnaires through Google forms obtained 300 respondents, while the distribution of offline questionnaires obtained 100 respondents through direct filling by respondents. Thus, a total of 400 respondents participated in filling out the questionnaire. This amount is considered to have met the minimum number of research samples that have been calculated previously using the Slovin formula. Furthermore, the characteristics of the respondents are explained in table 1 below.

TABLE I. PROFILE OF RESPONDENTS

No.	Description	Total	Percentage (%)
	Gender		
1	Male	212	53
	Female	188	47
	Age		
2	< 25 years	129	32
	25-35 years	157	39
	35-45 years	107	27
	> 45 years	7	2
	Education Background		
3	Bachelor Degree	231	58
	Diploma	80	20
	Senior High School	87	22
	Junior High School	2	1
	Secondary School	0	0
	Domicile		
4	Bandung	394	99
	Outside Bandung	6	2

Based on the table above, it can be seen that the majority of LAPOR application users are male (53%), while female users are 47%. Based on the age range, LAPOR users are dominated by ages 25-35 years, which is 39%, followed by the age range <25 years and 35-45 years, respectively by 32% and 27%. Meanwhile, users aged > 45 years tend to be unfamiliar with the LAPOR application, so that only 2% of respondents know the LAPOR application. Based on background education shows that users of the LAPOR application are dominated by bachelor degree (58%). Meanwhile, based on the domicile of the respondents, almost all respondents of this study were residents of Bandung City as evidenced by ownership of ID cards (99%).

B. Descriptive Analysis

Description of research variables obtained from the results of processing research data based on respondents' answers to the questionnaire, then carried out linear continuum analysis. According to Sukestiyarno [24] that the activity of tabulating values or also called frequency distribution tables is by grouping data according to a certain interval.

TABLE II. DESCRIPTIVE ANALYSIS

Variable	Score (%)	Conclusion
Performance expectancy	76,00%	Good
Effort expectancy	78,92%	Good
Social influence	76.64%	Good
Facilitating Condition	78.45%	Good

Based on the table above, it shows that all variables belong to the good category. This gives the conclusion that these variables have a high level of trust that the use of the LAPOR application will be useful, provide benefits and support their business in conveying aspirations and reporting on the inadequacy of government performance.

C. Hypothesis Testing

Data processing techniques in this study used multiple analysis tests with SPSS 20.0 as a tool. Table 3 below is a test result from multiple analysis techniques.

TABLE III. COEFFICIENT OF DETERMINATION

Model Summary				
Model	***R***	***R Square***	***Adjusted R Square***	***Std. Error of the Estimate***
1	.724[a]	.524	.519	1.60834

[a.] Predictors: (Constant), Facilitating Condition, Social Influence, Effort Expectancy, Performance Expectancy.

Based on these results it is known that the correlation value (R) is 0.724 and obtained a determination coefficient (R^2) of 0.524, the influence of performance expectancy, effort expectancy, social influence, and facilitating conditions on behavioral intention to use LAPOR application is 0.524 or 52% while the remaining 48% is influenced by other variables not examined in this study.

TABLE IV. MULTIPLE LINEAR REGRESSION ANALYSIS (T-TEST)

Coefficients[a]						
Model		***Unstandardized Coefficients***		***Standardized Coefficients***	***t***	***Sig.***
		B	***Std. Error***	***Beta***		
1	(Constant)	.987	.407		2.428	.016
	Performance_Expectancy	.194	.045	.246	4.299	.000
	Effort_Expectancy	.205	.042	.259	4.916	.000
	Social_Influence	.144	.043	.181	3.366	.001
	Facilitating_Condition	.115	.040	.148	2.852	.005

[a.] Dependent Variable: Behavioral intention.

Based on these results it is known that the behavioral intention constant value is 0.987, which means that if there is no value of performance expectancy, effort expectancy, social influence, and facilitating conditions, the behavioral intention value is 0.987. The coefficient for all variables shows positive results, which means that there is a positive relationship between the variable performance expectancy, effort expectancy, social influence, and facilitating conditions on the behavioral intention variable. Based on the results of the T test shows that the four variables consisting of: performance expectancy (X1), effort expectancy (X2), social influence (X3), and facilitating condition (X4) have a partially significant influence on behavioral intention (Y). Based on the value of T count, the variable that has the highest T value is the effort expectancy variable, while the variable that has the lowest value is the variable facilitating condition. From these results it can be concluded that partially the effort expectancy variable has the greatest influence on the behavioral intention to use the LAPOR application. This result is quite different with the study examined by Meizura et al. [25]. Based on previous study Meizura et al. [25], Price Value, Hedonic Motivation, Social Influence, Habit, and Facilitating Conditions have positive and significant impact on Behavioral Intention to use LAPOR Application. Similar method to Meizura et al. [25] and Shabrina et al. [26] stated that the variables influencing user to accept and use the SIP BDG Juara (another application from Bandung Smart City) are Price value, Hedonic Motivation and Habit, those variables have positive and significant influences on Behavioral Intention whereas Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating

Conditions have not significant influence toward behavioral intention. The difference of these two results might be caused by the cross section time method when examined LAPOR and SIP Juara in the beginning of the applications were launched with limited respondents.

TABLE V. MULTIPLE LINEAR REGRESSION ANALYSIS (F-TEST)

ANOVA[a]						
Model		***Sum of Squares***	***df***	***Mean Square***	***F***	***Sig.***
1	Regression	1123.184	4	280.954	108.612	.000[b]
	Residual	1021.767	395	2.587		
	Total	2145.581	399			
a. Dependent Variable: Behavioral_intention						

[a.] Predictors: (Constant), Facilitating_Condition, Social_Influence, Effort_Expectancy, Performa_Expectancy.

Based on the table above it can be seen that the value of Fcount is 108,612 with a significance value of 0,000. The value of Ftable for α = 0.05 with a value of df (n1) = 4 and df (n2) = 395, then the Ftable value of 2.395 is obtained because Fcount (108,612) is greater than Ftable (2.395) with a 5% error rate (α = 0.05). From these results it can be concluded that with a 95% confidence level that performance expectancy (X1), effort expectancy (X2), social influence (X3), facilitating condition (X4) simultaneously have a significant effect on behavioral intention to use the LAPOR application. The results of this study are in line with the previous study [20], where variables that influence behavioral intention using technology applications are performance expectancy variables, effort expectancy, social influence, and facilitating conditions.

IV. CONCLUSION AND RECOMMENDATION

Based on the test results, it can be concluded that all the hypotheses proposed in this study are proven (H1, H2, H3, and H4) where Performance Expectancy, Effort Expectancy, Social Influence, facilitating conditions have a significant and positive effect on the LAPOR's behavioral intention. The variable that has the highest value is the effort expectancy variable. Furthermore, the results of the Determination test show a determination coefficient (R^2) of 0.524, which means that the influence of performance expectancy, effort expectancy, social influence, and facilitating conditions on behavioral intention to use the LAPOR application is 0.52 or 52% while the remaining 48% is influenced by other variables examined in this study.

Based on the results of the study show that the aspect of performance expectancy, although in general respondents have a positive assessment of the benefits provided by the LAPOR application, the Bandung City Government is advised to increase responsiveness in handling public complaints through the LAPOR application. In addition, in the aspect of effort expectancy, the Bandung City Government is advised to continue to modify and develop the LAPOR application to make it more practical to use. On the Social influence aspect, based on the respondents' answers, the Bandung City Government was advised to increase the socialization of the use of the LAPOR application. Furthermore, in the facilitating condition aspect, the Bandung City Government is advised to improve the facilities and infrastructure needed to use the LAPOR application and develop the LAPOR application so that it can be used in various platforms such as social media platforms which include Instagram, Twitter, WhatsApp, etc. [25,26]. Future research is expected to be able to conduct research on other cities or regions that have implemented smart cities and increase the number of respondents so that the results are more representative.

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