



Public Satisfaction on Online Service Development: (Case Study: Bantulpedia Application)

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Abstract.

Purpose: This study analyzes public satisfaction with Bantulpedia Application users in Bantul Regency. The measurement was carried out using variables from the Online Service Index (OSI) framework consisting of institutional framework, service provision, content provision, technology, and e-participation.

Methods: The research method used is quantitative, with the primary data source being a questionnaire totaling 100 respondents. SmartPLS 3 software is used in conducting data analysis for this research.

Results: The research results show that variable institutional framework has a positive and significant influence on the satisfaction of Bantulpedia Application users. Meanwhile, the variables service provision, content provision, technology, and e-participation did not positively and significantly influence the satisfaction of Bantulpedia application users.

Novelty: This study is unique by using OSI parameters by correlating them with application-based public satisfaction assessments (online services), which the majority of this theory is only used to measure e-government development and various aspects of it. This research contributes to providing a new perspective on using OSI theory in the realm of online services (applications) not only as a predictive measurement but as a significant research object (a country). In addition, the empirical contribution is to conduct a public satisfaction test on using the Bantulpedia Application. So that later it can also be adopted and provide space for other local governments to adopt OSI as an indicator of this online service.

Keywords: Bantulpedia, Satisfaction, Online service, Applications users

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INTRODUCTION

Since the 1990s, e-government development has been pushed forward globally to improve public administration and the pillars of economic growth [1], [2]. Information and communication technologies (ICT) are used by e-government in all public sectors to ensure efficient service delivery [3]–[5]. The benefits gained from the advancement of information technology make all aspects of human life today can not be separated from information technology and also contribute to the emergence of innovations in the development of information technology [6]. Additionally, this e-government service improves public sector enterprises' innovation, accountability, and transparency [7], [8].

The need for internet will certainly never be separated from human civilization [9]. In Indonesia, online (digital) services development is regulated through Presidential Instruction No. 3 of 2003 [10]. In this Presidential Instruction, all central and regional government sectors are required to develop the digitalization of services online. This development aims to realize e-governance, and the government can directly provide services and interactions to the community [11]. With the development of e-government, opportunities for effectiveness, accountability, and transparency of public services will be able to improve services to the community [12].

In practice, several government sectors in Indonesia have sought the development of application-based e-government. Tangerang Gemilang, which Tangerang Regency initiated as a service innovation, engaged in services, reports, and complaints from the Tangerang community [13]. Then Jogja Smart Service with one-stop based services that are integrated with all services with leading sectors in the Regional Device

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Organization that house it [14]. In addition, the adoption of applications in supporting service digitalization is also followed by the Jakarta government through Jakarta Smart City Mobile (JAKI) [15], Medical Management system (MMS) Application in Surabaya City [16], Denpasar Pro Application as a one-stop service in Denpasar City [17].

The Bantul Regency Government then launched the Bantulpedia application to support the administration system of public services such as population, medical services, taxes, legal products, tourism, and others [18]. Here is a look at the user interface of the Bantulpedia application in Figure 1:

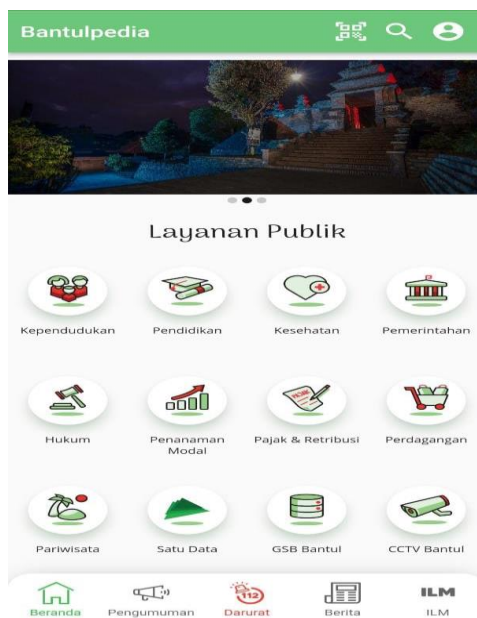


Figure 1. Print screen user interface bantulpedia

This application was released during the Covid-19 epidemic to implement the digitalization of services. The analysis of the Bantulpedia application then only discovered one: Factors Influencing the Use of the Bantulpedia App During the Covid-19 Pandemic to Create a Smart City in the Bantul Regency [19].

It is essential to understand the elements that determine users' intention to continue using the application [20]. In application-based public services in Bantul, users experience confusion and confusion over the services provided, namely the consistency of application shortcuts [21]. Then this service system still found problems in service optimization that could have been more effective and compatible between the use of smartphones and speed in services [22]. Therefore, this study will use a different perspective on user satisfaction with using the Bantulpedia Application as an online service platform provided by the Bantul Regency Government.

The United Nations (UN) then formed a development measurement through the E-government Development Index (EGDI), which consists of the "Human Capital Index (HCI), Online Service Index (OSI), and Telecommunication Information Index (TII)" [23]–[25]. OSI is one of the indicators in EGDI to measure online services to the public by utilizing ICT devices [26]. If the company can ensure the implementation of several aspects according to standard operating procedures, the customer will be satisfied with the product or service provided [27]. This service also connects customers (the people) with the government through the tools provided. Then, four indicators can be used to assess how well online services function, including the Institutional Framework, Service Provision, Content Provision, Technology, and E-participation, all of which have a positive and significant impact on the Institutional Framework [28].

From the literature that has been found, the theory of OSI is used as a parameter in the development of e-government development of a country [26], [29]–[31]. The theory also has significant implications for how influential services are to public acceptance and trust [32], [33]. Then OSI is used as a parameter to assess

the impact of Information Technology (IT) on e-government development [34]. The aspect of Sustainable Development Goals (SDGs) is also a research theme that is used as the object of OSI's influence [35], [36]. In addition, this OSI parameter is widely used to predict the aspect of entrepreneurship level of a country [37].

Therefore this study fills the (gap) from the above research which the majority of parameters from OSI are used to measure the e-government development of a country along with ICT aspects. This study will test the effect of OSI on public satisfaction with the scope of research on local government (Bantulpedia Application on Bantul Regency). In measuring the level of public satisfaction with an application-based service, several studies say that the Community Satisfaction Index (IKM) Permenpan RB No. 14 of 2017 in Indonesia indicator is widely adopted [38]–[41]. Then a study [42] used the MPE Exponential Comparison method to measure the community satisfaction index. In addition, the selection of waterfall development methods is also used to measure the index of community satisfaction with local government digital services [43] and Importance Performance analysis (IPA), which is also a measurement of the satisfactory performance of a service.

From standardizing the use of OSI theory to measure the e-government development level of any country and public satisfaction in Indonesia, most of which adopted IKM according to Permenpan RB No. 14 of 2017. So the author concludes that the approach to be adopted in measuring community satisfaction is the Online Service Index (OSI) theory. Then, this study contributes offers a fresh viewpoint on applying OSI theory to internet services (applications) as both a substantial research object (a nation) and a predictive measurement. This research is essential in providing an evaluation of the public satisfaction of the people of Bantul Regency in using Bantulpedia services for local governments to deliver community satisfaction and continue to provide service innovation

Research Question: what is the public satisfaction with online service development in Bantulpedia Application?

METHODS

This research uses quantitative methods to describe various conditions from various situations or variables, research objects, that arise in society. This study used random sampling of respondents with respondents in Bantulpedia Application users. There are several stages in this research in Figure 2:

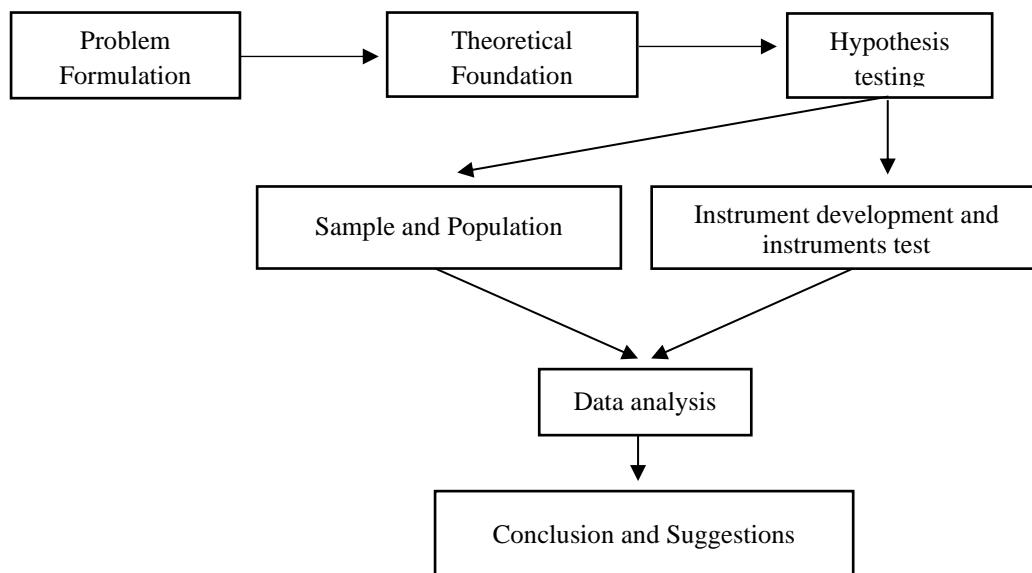


Figure 2. Research of stage

Figure 2 shows the research stages: problem formulation, theoretical foundation, hypothesis testing (sample and population and instrument development also, instrument test), data analysis, and conclusion and suggestions.

Sample

In determining the number of research respondents, the author uses the Slovin formula with calculations::

$$n = \frac{N}{1+Ne^2}$$

Details:

n = Sample

N = Population

e = sampling error

The sampling error (e) used by the author is 10% by considering aspects of the population that are very heterogeneous and the author's limitations. The number of respondents obtained in this study was 699,784 (productive age population aged 15-64 years). Here is the calculation of the Slovin formula for determining the sample:

$$n = \frac{N}{1+Ne^2}$$

$$n = \frac{699.784}{1+699.784 (0,1)^2}$$

$$n = \frac{699.784}{1+699.784 (0,01)}$$

$$n = \frac{699.784}{6.957,85}$$

$$= 100,5747$$

$$n = 100$$

The total sample used in the study was 100 users, and the sample population was users in Bantul Regency.

Research Instrument

The instrument in the study used questionnaires to explore related public satisfaction with the Bantulpedia application. This questionnaire uses the theory of Online Service Index (OSI): “Institutional Framework, Service Provision, Content Provision, Technology, and E-participation” from EGDI indicators [44]. Here is the description in Table 1:

Table 1. Instrument OSI framework

No.	Online Service Index	Indicator	Number of Question
1.	Institutional Framework	Availability and accessibility,	1
		Consumer protection,	1
		Regulation and supervision	1
2.	Service Provision	Quality of service,	1
		Service availability, Personalization and customization	1
3.	Content Provision	Content quality,	1
		Content diversity,	1
		Content accessibility	1
4.	Technology	Technology reliability,	1
		Ease of use, Technology innovation	1
5.	E-Participation	Participation rate, Engagement and openness,	1
		Impact and influence	1

Then the following authors show the research questionnaire design shown in Table 2:

Table 2. Questionnaire design

Variable	Indicators
Institutional Framework	To what extent does the public service respond quickly to your complaint or request? How do you assess the speed and efficiency of services provided by public service? Is the information submitted by parties related to public services reliable and honest?
Service Provision	What do you think about the availability of features and functions this online service platform provides? Does this online service platform provide clear and transparent information regarding the privacy policy and protection of user data? To what extent do you feel this online service platform is subject to adequate regulation and supervision?
Content Provision	How applicable does this online service platform, Like you provide the content? To what extent is this online service platform able to provide content that matches your interests or preferences? How do you assess the content loading speed and streaming quality this online service platform provides?
Technology	How often do you experience technical problems or glitches using this online service platform? To what extent do the instructions or guidance provided by this online service platform help you use the service effectively? How do you assess the speed and responsiveness of this online service platform when you interact or navigate?
E-Participation	What is the level of involvement in the community or user forum on this online service platform? How do you assess the responsiveness of this online service platform to user feedback, suggestions, or requests? How do you learn about the influence or changes that occur in the life of academics from using this online service platform?

OSI Framework:

Institutional framework

This institutional framework aims to build a diverse framework for online services. This will undoubtedly require the help of ICT platforms to build collaboration between sectors [45]. Then in this institutional framework also has arrangements, especially in institutions, to make legitimacy and legal guarantees [46].

Service provision

Good service quality is measured by how the quality of service can provide new efficiency and effectiveness because it is supported by ICT in it [47]. This service is also integrated from data that is private, public, and government or private sector[48]. The goal is the availability of services to all parties and the integration of each other.

Content provision

By supplying content, the government will be able to provide the public with information that is thorough, pertinent, timely, and accurate [49]. In addition, the provision of content and accessibility factors are also parameters for the public to access and interact on e-government sites that have been provided [50].

Technology

Adopting technology services strongly supports e-government development because it provides efficiency and effectiveness in government performance [51]. So that it will be a functional space for delivering services efficiently and accessible to the community. Mittal [52] revealed that technology in e-government would also encourage the government to continue to innovate services to improve increasingly responsive public services.

E-participation

E-participation is an aspect to determine the success or failure of a public service. The government provides services to promote openness, and this trust and innovation spur public engagement [53]. Therefore, the main factor of the success of e-participation is supported by government ICT in providing access to services [54]. See Figure 3:

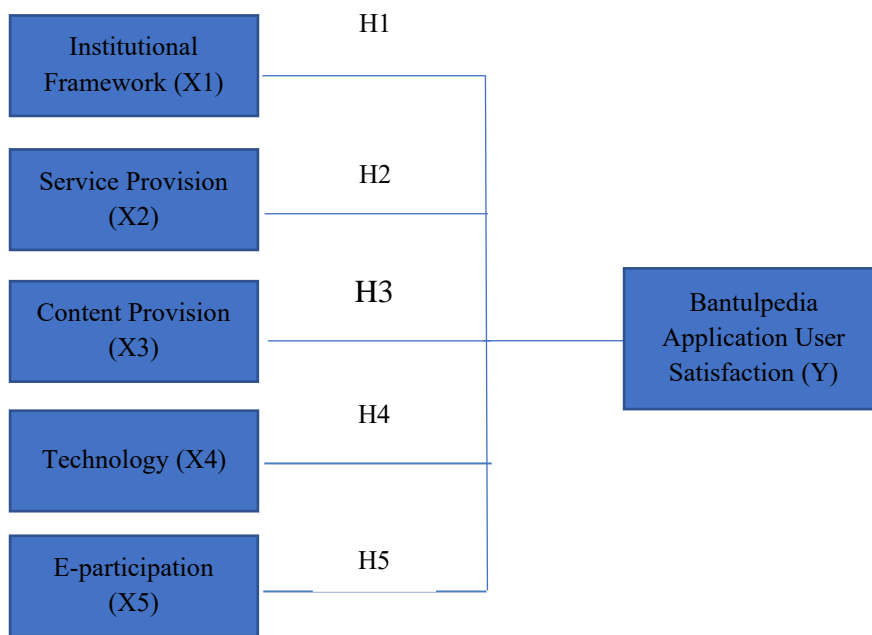


Figure 3. Theoretical framework

H1: Institutional Framework (IF) (X1) significantly influences users' satisfaction with the Bantulpedia Application (Y).

H2: Service Provision (SP) (X1) significantly influences the user satisfaction of the Bantulpedia Application (Y).

H3: Content Provision (CP) (X1) significantly influences the effect on the user satisfaction of the Bantulpedia Application (Y).

H4: Technology (T) (X1) significantly influences the user satisfaction of the Bantulpedia Application (Y).

H5: E-participation (EP) (X1) significantly influences user satisfaction with the Bantulpedia Application (Y).

This study made use of a primary data model based on the outcomes of a survey. A questionnaire is a tool for data collection that asks respondents to provide written answers to several questions. The researchers distributed Google Forms to random local Bantulpedia Mobile Application users.

SmartPLS 3 software is used to test hypotheses, validity calculations, and reliability analyses between study variables during data processing. A Likert scale is used in the questionnaire's indicators to gauge respondents' perceptions. The scale has five options: (1) extremely satisfied, (2) satisfied, (3) neutral, (4) dissatisfied, and (5) very dissatisfied.

Common Method Bias (CMB)

CMB is a measurement method to determine the absence or bias of a study. Kock explained that the CMB test is below the value of 3.3 (Collinearity Statistics), so the research data will be free from the CMB test [55]. From the results of the SmartPLS 3 CMB test data in the author's study, no CMB was found or following all scores below 3.3; here are the results in Table 4:

Table 4. Common method bias (CMB)

Variable	Collinearity Statistics (VIF)
BP1	1.637
BP2	1.560
BP3	1.591
CP1	1.808
CP2	1.807

CP3	1.554
EP1	1.335
EP2	1.588
EP3	1.475
IF1	1.653
IF2	1.708
IF3	1.408
SP1	1.358
SP2	1.480
SP3	1.566
T1	1.469
T2	1.491
T3	1.734

RESULTS AND DISCUSSIONS

The Demographic of The Respondents

Table 3 presents the demographic profile of the respondents. Most of the respondents were male, 68.40%, while those with gender had a percentage of 31.50%. Then, in terms of the age of the respondents, the central dominance was the age of 17-25 years with 55.10%, 27.60% at the age of 26-35 years, and 16.30% at the age of 36-45 years.

Table 3. The demographic of the respondents

Characteristic	Bantul Regency	
	Freq	Presents
Gender		
Man	67	68,40%
Women	31	31,50%
Age		
17-25	54	55,10%
26-35	27	27,60%
36-45	16	16,30%
>45	0	0,00%
Education Level		
Masters Degree	1	1,00%
Bachelor Degree	58	59,20%
Senior High School	39	39,80%
Junior High School	0	0,00%
Primary School	0	0,00%
Bantulpedia APP User Experience		
< 1 Year	78	79,60%
1-2 Year	19	19,40%
3-4 year	1	1%
> 5 Year	0	0,00%

Furthermore, on the education side of respondents, the main dominance is bachelor's degrees with a percentage of 59.20%, Senior High School graduates with 39.80%, and master's degrees with a portion of 1.00%. In addition, in terms of experience using the Bantulpedia Application, respondents with the highest experience are less than 79% a year, 1-2 years experience 19.40%, and 3-4 years 1%.

Means, Standard Deviation, and Cronbach's Alpha

Cronbach's Alpha is used as an indicator to calculate the correlation between the scale and all the variables that have been created. If the value in Cronbach's Alpha is 0.70, it indicates realistic and valid (Nunnally, 1978). In Table 5, it is shown that all constructions have high-reliability values (CP = 0.797, EP = 0.728, IF = 0.764, SP = 0.733, T = 0.756, PS = 0.775).

Table 5. Means, standard deviation, and cronbach's alpha (N = 100)

Variable	Sample Mean	Standard Deviation (STDEV)	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)	
Content Provision	3.486	3.667	0.797	0.881	0.711	Valid
E-participation	3.503	4.000	0.728	0.846	0.647	Valid
Institutional Framework	3.432	3.667	0.764	0.863	0.678	Valid
Service Provision	3.486	4.000	0.733	0.869	0.689	Valid
Technology	3.459	4.000	0.756	0.848	0.651	Valid
Public Satisfaction	3.442	3.333	0.775	0.860	0.672	Valid

Then table 5 also shows the average value of high construct frequencies with classification into three groups: 1 – 2.33, 234 – 3.67, and 3.68 – 5, with frequencies at low, medium, and high internal levels. These results show that the Content Provision indicator is the highest satisfaction level variable with the highest reliability value. The lowest satisfaction score is placed on the e-participation variable. Then from the results of composite reliability, which is > 0.60, it can be concluded that the research variables: content provision, e-participation, institutional framework, service provision, technology, and public satisfaction meet the reality test. In addition, the AVE value is said to be valid if the score is > 0.50. Thus it can be concluded that all the above variables have met convergent validity or valid.

Hypothesis Testing

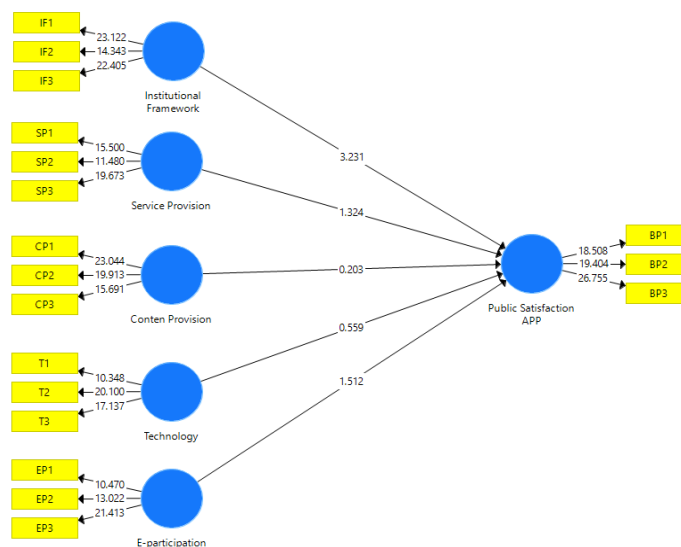


Figure 4. Output bootstrapping

In Figure 4, hypothesis testing has been carried out with the SmartPLS 3 bootstrapping method on independent and dependent variables to determine the value of reliability and validity of the study. The test uses statistical numbers T and P Values to test this Hypothesis and is presented in tabular form. The validity value can be seen if it has a value of more than 1.96 (T-Statistic) and is smaller than 0.05 (P-Value) [56].

Table 6. Hypothesis testing for bantulpedia application users

Variable	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values	Hypothesis
Content Provision	0.031	0.030	0.147	0.211	0.833	Not Accepted
E-participation	0.202	0.220	0.129	1.561	0.119	Not Accepted
Institutional Framework	0.390	0.376	0.114	3.429	0.001	Accepted
Service Provision	0.193	0.208	0.147	1.315	0.189	Not Accepted
Technology	0.088	0.074	0.154	0.573	0.567	Not Accepted

Content Provision (CP) Hypothesis – Bantulpedia Application (BP) Users Satisfaction In the CP hypothesis, it can be seen that the P-value is 0.833 (ideal score <0.05). Then in the T statistic, the CP value is 0.211 or below the ideal score, namely (ideal score >1.96). So it can be concluded that the CP variable does not significantly affect Bantulpedia Application user satisfaction.

E-Participation (EP) Hypothesis – Bantulpedia Application (BP) Users satisfaction In the EP hypothesis, the score that appears on the P-value is 0.119 or (ideal score <0.05). On the T score, The visible value statistics are 1.562 or still below the ideal score (>1.96). The conclusion that can be drawn is that the EP variable is not significant and affects the satisfaction of the Bantulpedia Application user community.

Institutional Framework (IF) Hypothesis– Bantulpedia Application (BP) Users Satisfaction In the IF hypothesis table, the P-value presented is above the ideal score (<0.05), which is 0.001. As for T, the statistics have a score above the ideal value (>1.96), with a score of 3.429. So that it can be interpreted that the IF variable shows the influence and significance of the satisfaction of Bantulpedia Application users.

Service Provision (SP) Hypothesis – Bantulpedia Application (BP) Users Satisfaction SP hypothesis table, the score of the statistical T is 1.315 or below the ideal score (>1.96). In contrast, the P-value is at a score of 0.89 or (ideal score <0.05). Hence, the conclusion that can be drawn is that the SP variable has no effect and is significant on the satisfaction of Bantulpedia Application users.

Technology (T) Hypothesis – Bantulpedia Application (BP) Users Satisfaction The P-value listed in the table above is 0.567 (ideal score <0.05). Then the score on the T-statistic is 0.573 (ideal score >1.96). Therefore, the conclusion is that variable T has no significance and influence on user satisfaction with the Bantulpedia Application.

Discussion

This research will empirically test the OSI framework in the context of public satisfaction. In the first Hypothesis, "Institutional Framework (IF) has a positive and significant effect on "Bantulpedia Application community user satisfaction" (accepted). This is supported by previous studies that say the "Institutional Framework" has an influence and is significant on "user satisfaction of mobile application services" [57]–[59]. In addition, in other literature, it is stated that this "institutional framework" is supported by innovations from the government involved in providing accessible public services [60]–[62].

The second Hypothesis, "Service Provision (SP)," does not have a significant effect on "Bantulpedia Application community user satisfaction" (not accepted). This finding is contrary to previous literature, which states that "Service Provision" significantly affects the "satisfaction of mobile application service users" [63]–[65]. This is also often expressed by people in some regions who still complain about the availability of integration systems, especially digital-based ones [66].

The third Hypothesis, "Content Provision (CP)," has no influence and is significant on "Bantulpedia Application community user satisfaction" (not accepted). The hypothesis test negates previous research, which states the variable "Content Provision" influences on "satisfaction of mobile application service users" [67], [68]. Then, in the fourth Hypothesis, "Technology" (T) has no effect and is significant on "Bantulpedia Application community user satisfaction" (not accepted). This is negated by previous studies

that explain the variable "Technology" has substantial implications for the "satisfaction of mobile application service users" [69], [70].

Then finally, the Hypothesis, "E-Participation," has a significant influence on the "satisfaction of users of mobile application services" (not accepted). This variable negates previous research explaining that "E-Participation" positively influences on "satisfaction of mobile application service users" [71], [72].

These accepted and rejected hypotheses show that there are affirmations and negations in variables from previous studies. In the framework of E-Government Development is the "Online Service Index," which consists of: "Institutional framework, Service Provision, Content Provision, and E-Participation" [73]. The main reason the above variables have similarities and differences is the different research focus. In addition, the main thing is the development of online services that still need to be built with the availability of resources and supporting devices in e-government development. In General, the development of online services tested using OSI parameters already has all devices (IT, Data Integration, and Blockchain System) that have been tested in providing public services. So then the impact is positive and significant. Thus, the test of this OSI indicator will be an evaluation material for service providers (government) and open up new spaces in testing an application-based service.

CONCLUSION

The primary purpose of the empirical tests in this study is to assess the effects of the institutional framework, service delivery, content delivery, and e-participation on the satisfaction of Bantulpedia application users. The institutional structure is one of the five factors that substantially affect how satisfied mobile application users are. The pleasure of users of mobile applications, however, is not significantly impacted by other factors (such as service delivery, content delivery, and e-participation).

The Bantulpedia Application, which serves as a platform for services for the residents of Bantul Regency, will be improved as a result of the study's findings and used as a guide. Next, the research's contribution offers a fresh viewpoint on applying OSI theory to online services (applications) rather than only as a predictive assessment and a sizable research object (a country). A public satisfaction test on using the Bantulpedia Application is another empirical contribution. For other local governments to use OSI to measure this online service in the future and give it room to grow.

Additionally, one of the most important and influencing variables is the institutional framework can serve as the cornerstone for the continued advancement of e-government. However, this study has several constraints, including a controllable focus and a short (1-month) data collection period with a limited set of variables and respondents. As a result, this study's limitations can serve as a guide and testing ground for future research.

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