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## Analysis the Critical Factors of M-government Service Acceptance: An Integrating Theoretical Model between TAM and ECM

### Abstract

The development of smartphones has an essential role in digital services, which have the advantage of access to health services that can be performed anywhere and anytime. Unfortunately, the diffusion process of smartphone technology in the provision of health services faces the problem of decreasing the actual use of mobile health applications. Previous studies on m-government health services have also focused on using TAM and UTAUT to predict individual user behavior. A gap in the literature has been identified in previous studies. This study investigates the critical factors for the individual acceptance of m-government health services, especially the Peduli Lindungi mobile health service. The two theoretical models, TAM and ECM, were integrated to enhance the body of knowledge in predicting individual behavior in the m-government healthcare context. A quantitative method was used to analyse a total of 200 data. PLS-SEM was used to analyze the outer and inner models. The findings of this study support all hypotheses. The study's findings show that Perceived Usefulness, Perceived Easy to Use, and Satisfaction significantly affect on Intention Use; Perceived Usefulness, Perceived Easy to Use, and Expectation Confirmatory significantly affect on Satisfaction, Perceived Easy to Use has a significant effect on Perceived Usefulness. Expectation confirmation significantly affected Perceived Usefulness and perceived ease of use. The proposed model is successfully validated. Future research could consider integrating these theoretical models to assess the critical factors influencing the acceptance and use of digital services in other contexts.

### Keywords:

digital services; M-government services; TAM; ECM; user intention

### Introduction

Smartphones play an essential role in modern health services (Lee et al., 2018; Saare et al., 2019). According to Wang et al. (2019), there are three reasons

smartphones have become potential technology devices in modern health services. 1) there is a positive trend of increasing the use of smartphone devices from year to year. 2) A change in the

pattern of demand for health services encourages changes in the pattern of health services provided by insurance companies. 3) The convenience of smartphones provides a sense of comfort for users, which has an impact on changes in product purchase transaction patterns to meet needs. Many studies have shown that smartphones can provide more economical remote healthcare as technological devices (Alaiad et al., 2019; Breil et al., 2019; Lee et al., 2018; Saare et al., 2019). The existing literature shows that the use of smartphones in healthcare manifests itself in implementing m-health applications. It is a revolution in e-government, defined as the adoption of ICTs in the implementation system (M. Huda & Yunas, 2016; Napitupulu, 2016, 2017; Rahmadany, 2021).

E-government is a new form of bureaucratic reform to improve the quality of public services for citizens. In addition, e-government aims to improve government performance and meet the public's need for transparency and accountability of government financial information to realize good governance (Napitupulu, 2016, 2017). M-health applications are health services that utilize smartphone technology devices through internet access. According to Breil et al. (2019), an M-health application supports self-management of health and offers positive benefits, such as prevention and reminder features, that are more promising and cost-effective. In addition, M-health services have advantages in terms of access to health services that can be provided anywhere and anytime. In developing countries, the m-health application is a solution to the digital divide in health service problems (Hussain et al., 2018). Unfortunately, using smartphones in health services also has a negative impact that causes excessive changes in a person's behavior (Lee et al., 2018). Apart from the negative impact, using smartphones in health services is an innovation to realize good health service governance.

Research on m-health services has recently attracted considerable attention. This is because

m-government services have the advantage of rebuilding the performance of e-government services to make them more efficient, effective, and open (Rossel et al., 2006). Unfortunately, despite the potential benefits of m-government health services, few studies have demonstrated their effectiveness (Byambasuren et al., 2018). M-government health services are facing many challenges, the actual use of health applications that users download from time to time, starting to decline because of problems related to trust, suitability, personalization, and accessibility (Shemesh & Barnoy, 2020) and uses that include narrow functionality, low user engagement, and non-compliance with the target public for m-health applications (Nunes et al., 2019). This provides a negative experience for many patients accessing digital health services (Xie et al., 2020b).

Previous research has predicted the behavior of users in adopting and accepting mobile health services. Some researchers have used the TAM variable (Lee et al., 2018; Nusairat et al., 2021; Saare et al., 2019; Shemesh & Barnoy, 2020; Wang et al., 2019; Xu et al., 2022), UTAUT (Alaiad et al., 2019; Breil et al., 2019; Garavand et al., 2020; Nunes et al., 2019), UTAUT 2 (Yu et al., 2021), and some of these integrated models between TAM and UTAUT (Lee et al., 2018; Saare et al., 2019) to study user behavior in m-health applications. Lee et al. (2018) investigated the factors influencing acceptance of Mobile Health services in South Korea. This study integrated the TAM and UTAUT to predict user behavior. Saare et al. (2019) used UTAUT to examine the behavior of adults receiving a mobile health application in Iraq. Alaiad et al. (2019) showed patients' adoption behavior of M-Health in developing countries. This study proposed the integration of the UTAUT model by adding other variables. Wang et al. (2019) conducted an empirical investigation to explain user acceptance of the mobile health insurance base and the TAM. Only empirical research has investigated user adoption by integrating

the TPB, PMT, and personal health differences (Zhang et al., 2020). The following research question arises: What are the critical factors impacting an individual's behavioral intention to utilize technology? According to the author's literature evaluation, no research has used the expectancy-confirmation model (ECM) to explain how individual behavior adopts and accepts m-government services, especially in healthcare.

This study differs from the previous research. Prior research has focused on the use of particular theories. It must be more knowledgeable about how users adopt and accept m-government health services (Li, 2020). To fill the literature gap, this study proposes a model, a theoretical integration of TAM and ECM models. The goal of this study is providing a more comprehensive body of knowledge in the literature predicting individual behavior in accepting new technologies in digital healthcare services contexts. Two theoretical models, TAM and ECM, were chosen because previous research rarely used them to predict the behavior of m-government service adoption. A recent study needs to be more extensive in exploring the relationship between TAM and ECM variables in the mobile payment context (Sarassina 2022). In addition, this study was conducted in a developing country in Indonesia. The experience of a developing country is worth reviewing because developing countries use ICT to address critical issues, such as bridging knowledge interests, social access disparities, and decreasing negative consequences on long-term national development (Malisuwan et al., 2016). Therefore, this research is essential because it better understands what drives individuals' behavioral intentions to use digital service facilities. This provides what we believe to be a valuable interpretation of emerging behavioral studies in public administration. The structure of this research manuscript begins with an introduction that contains the background of the problem, the novelties offered, and research goals.

The author presents a literature review in the next phase and develops the hypotheses, research methods, results, and discussion. At the end of this phase, the author describes the research contributions, limitations, and suggestions.

## **Literature Review**

Technology Acceptance Model believes in actual use as acceptance of the presence of a new technology, which is influenced by the user's attitude towards the relevant technology. Specifically, this model focuses on the impact of two predictive factors: perceived usefulness and perceived ease of use. These two construction variables influence a user's emotional beliefs (Lin et al., 2011). Both are predictor factors assumed to significantly influence users' attitudes towards technology use. In addition, the two construction variables are also factors in the user's subjective assessment of how far the benefits are provided by the technology (Wirtz et al., 2019). The TAM explains that perceived usefulness and ease of use directly impact an individual's behavioral intentions, and perceived ease of use directly affects perceived usefulness (Davis, 1989). Although the TAM has substantial explanatory power in predicting the use of technological products (Nyoro et al., 2015), the construction emphasizes the technological aspect of using new technological products. As a result, TAM construction for predicting the use of technology products needs to be improved. The weakness of TAM, PU, and PEOU is their inability to determine the driving factors influencing their confidence in technology use (Yousafzai et al., 2007). This leads to low descriptive richness in predicting the use of technology products and is considered a significant drawback of the TAM (Poong & Eze, 2015; Poong & Eze, 2008). The TAM must be more robust in ignoring other assessment aspects of new technology products (Yuen et al., 2021). Therefore, the modification of TAM is required. Previous studies have offered different research

frameworks for modifying TAM using other variables or theoretical models. For example (Lee et al. (2018) and Saare et al. (2019) integrated the TAM and UTAUT, and Sarassina (2022; Xie et al., 2020) integrated the TAM and ECM.

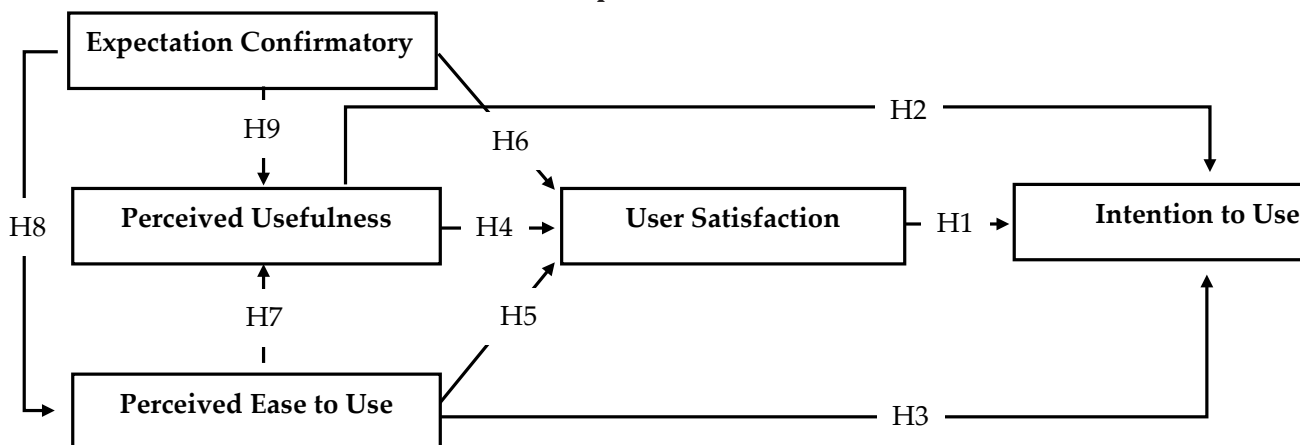
The expectancy-confirmation model is used to analyze intentional behavior for sustainable use. ECM is a model built based on TAM and ECT (Xie et al., 2020b). According to Sarassina (2022a), the ECM and TAM have the same construct. ECM is a theory that can predict the continued behavior of users when using a new system. Despite the similarities between TAM and ECM, the two models have differences that require attention (Sarassina, 2022a). ECM theory has advantages in explaining the user belief factor in using sustainable technology. Therefore, the advantages of the ECM can address TAM's shortcomings of the TAM. The ECM focuses on perceived usefulness, confirmatory expectations, and satisfaction, which directly influence continuance intention.

Based on theoretical studies, the TAM and the ECM, we developed a proposed model. The aim of this study was to investigate the factors influencing individual behavioral intentions in m-government services. Subsequently, the concepts and structural relationships in the proposed model were tested. Figure 1 presents the research hypotheses of the theoretical constructs.

Expectation confirmation, perceived usefulness, perceived ease of use, and satisfaction were the independent factors in this study. In contrast, satisfaction and perceived usefulness were considered intermediate factors, with intention as the dependent variable. **Figure 1 shows** the variable name abbreviations used in this study to simplify and assign a specific label to each calculated variable.

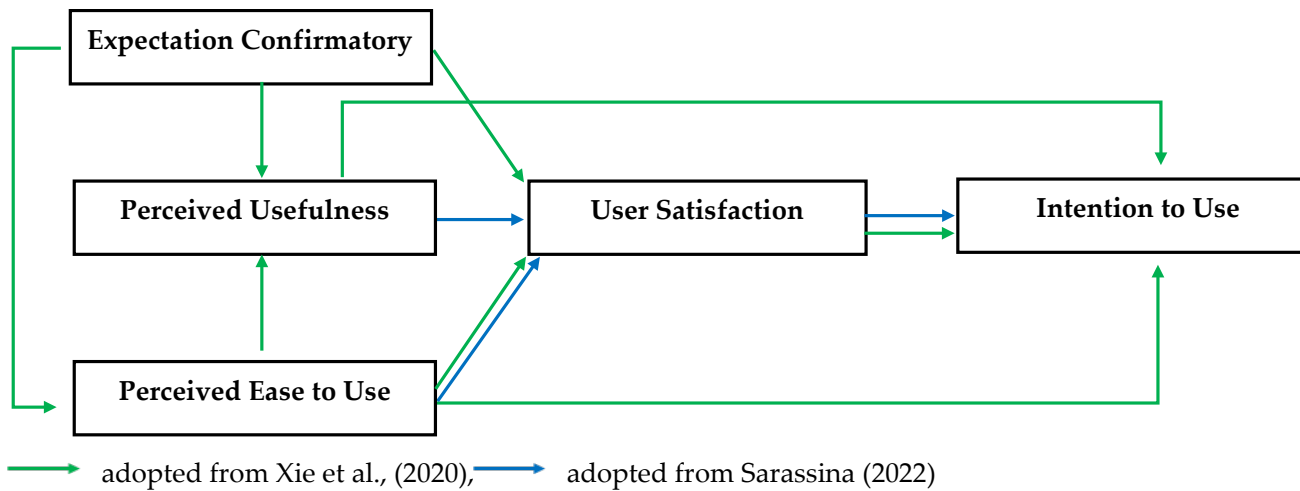
In the empirical investigation of previous studies, the TAM variable has proven to be a strong model for predicting the individual behavior to adopt and accept technology-based services, such as mobile health applications (Lee et al., 2018; Nusairat et al., 2021; Saare et al., 2019; Shemesh & Barnoy, 2020; Wang et al., 2019; Xu et al., 2022). In addition, the integration of TAM and ECM was confirmed in a previous study (Sarassina, 2022a; Xie et al., 2020b). For example, Xie et al. (2020) successfully validated the theoretical integration of TAM and ECM models in predicting individual behavioral intentions in the context of shared nurses. Unfortunately, the proposed model's relationship between perceived usefulness and satisfaction is yet to be investigated. Conversely, Sarassina (2022) conducted empirical research that validated a positive relationship between perceived usefulness and satisfaction, perceived ease of use on satisfaction, and satisfaction with

**Figure 1.**  
**Proposed Model**



Source: proposed by the author

**Figure 2.**  
**Recent Investigation between TAM and ECM**



*Sources: integration of the models from previous works (Sarassina, 2022; Xie et al., 2020)*

intention to use in a mobile payment continued context. This study has yet to investigate other path coefficients of the proposed model.

However, PEOU significantly affects PU and user satisfaction. A study investigated the positive effect of PU on user satisfaction and continuance intention in mobile health applications (Lu et al., 2022). Lu et al. (2022) investigated the positive effect of user satisfaction on continuance intention. The results of his research prove that there is a strong influence on the hypothesis, with  $\beta = 0.824$ . In contrast to Xie et al. (2020), technological features should be easy for consumers in a business context. This convenience has an impact on accelerating consumers' time in learning the features of the technology provided and, ultimately, increasing their satisfaction with the product and purchase opportunities (Wilson et al., 2021). Research (Sarassina, 2022a) also confirms TAM variable significantly affects user satisfaction. His research proves that PU has a powerful influence on satisfaction ( $\beta = 0.497$ ,  $t\text{-value} = 12.380$ ,  $p\text{-value} = 0.000$ ), while PEOU also has a strong influence on satisfaction ( $\beta = 0.378$ ,  $t\text{-value} = 9.520$ ,  $p\text{-value} = 0.000$ ). Based on this explanation, we propose the following hypothesis:

H1: There is a significant relationship between user satisfaction and intention to use m-government services.

H2: There is a significant relationship between perceived usefulness and the intention to use m-government services.

H3: There is a significant relationship between perceived ease of use and the intention to use m-government services.

H4: There is a significant relationship between perceived usefulness and user satisfaction.

H5: There is a significant relationship perceived easy to use and user satisfaction.

H6: There is a significant relationship between expectation-confirmation and user satisfaction.

H7: There is a significant relationship between perceived ease of use and usefulness.

H8: There is a significant relationship between expectation-confirmation and perceived ease of use.

H9: There is a significant relationship between expectation-confirmation and perceived usefulness.

## Methods

A quantitative method using an online survey was used. The quantitative method is appropriate for performing an explanatory factor analysis of the relationship between



the variables from the proposed model. This quantitative approach has several advantages over other research methods. A relatively short period of data collection can be performed quickly. Primary data were obtained from respondents' answers. An online survey technique using the Google Form facility was chosen because it can increase the reach of the survey distribution more efficiently and effectively. Respondents were faced with 19 survey question items. Each item of the construct was adopted from previous research and modified according to the research object (the questionnaire is detailed in Table 1). Respondents' answers were categorized on a Likert Scale to assess all items. The Likert scale was used from 1 (strongly disagree) to 5 (strongly agree). Secondary data were collected from scientific articles and books as reference sources while compiling the manuscripts.

Google Forms links containing question items were deployed from March 1, 2022, to June 1, 2022. Google Forms was divided into three

components. In the first phase, respondents are questioned about their understanding of the Peduli Lindungi application such as "Do you know the Peduli Lindungi application?", "Have you ever used the Peduli Lindungi application to get government services?" and "What services do you require from the Peduli Lindungi application?". In the next section, a summary of the survey information and general questions about the respondent's information (such as gender, occupation, age, and level of education) are presented. In the final phase, respondents were given instructions on how to complete the form, followed by 19 question items. The target population of this research was the Indonesian people who used the application. Consequently, the respondents' criteria were determined. The criteria for the respondents were Indonesian citizens who used the Peduli Lindungi m-health service application to access government and health services using Peduli Lindungi. We decided to use convenience sampling because respondents filled out the questionnaire based on their desire

**Table 1.**  
**Questioner development**

Construct	Indicators	References
Intention Use	IU1: I will recommend Peduli Lindungi application to my family and colleagues IU2: I plan to use Peduli Lindungi application in accessing health services. IU3: I intend to use Peduli Lindungi application in the future	(Pai & Alathur, 2019; Sarassina, 2022a)
Satisfaction	Satis1: I think Peduli Lindungi application is very helpful Satis2: I am content with Peduli Lindungi applications performance Satis3: I am confident with the health services provided by Peduli Lindungi application. Satis4: The experience of using Peduli Lindungi application will make me happy. Satis5: Overall, I am satisfied with the function provided by Peduli Lindungi application.	(Pai & Alathur, 2019; Sarassina, 2022a; Xie et al., 2020b)
Perceived Usefulness	PU1: Using Peduli Lindungi application increases the quality of work I do. PU2: Using Peduli Lindungi application is advantageous in accessing health services. PU3: Using Peduli Lindungi application is useful in accessing health services daily PU4: Using Peduli Lindungi application will make it easier to access health services.	(Pai & Alathur, 2019; Sarassina, 2022a)
Perceived Easy to Use	PEOU1: Learning to operate Peduli Lindungi application will be easy for me PEOU2: I can easily become skilful at using Peduli Lindungi application in accessing health services. PEOU3: I can use Peduli Lindungi applications effectively to achieve my specific goals PEOU4: Overall, Peduli Lindungi is easy to use	(Li, 2020)
Confirmation	EC1: Using Peduli Lindungi in accessing health services provided a better experience than I expected EC2: Peduli Lindungi application provides a better service than I expected EC3: Most of my expectations for the Peduli Lindungi application have been met.	(Xie et al., 2020b)

*Sources: adopted and modified from previous works*

to participate and felt safe. We also choose to use convenience participation in this survey because the respondents who provided the data had to meet the respondents' criteria.

The PLS-SEM approach was used to analyze the outer and inner models using SmartPLS software. PLS-SEM has several advantages over CB-SEM (Jaya et al., 2019): 1) PLS-SEM can explain the effect of many independent variables on the dependent variable. 2) PLS-SEM can be used to explore and predict confirmatory factor analysis (CFA) and exploratory factor analysis (EFA) on the construct theory or measurement model (outer model). The PLS algorithm and bootstrapping technique are nonparametric approaches used to examine the statistical significance of different PLS-SEM models. Calculations and data analyses were conducted to examine the validity, reliability, and hypothesis testing using SmartPLS software. Convergent validity and reliability were determined by factor loadings, AVE, CR, and CA calculations, and Fornell-Larker's criterion calculations determined discriminant validity. The authors used a factor loading limit value of 0.7 to meet the minimum criteria of the previous work's convergent and discriminant validity tests (Ahmad et al., 2019; Alaiad et al., 2019; Chin et al., 2003; Xie et al., 2020b). An AVE limit value of 0.50 to fulfill the minimal requirements of construct validity (Khwaja & Zaman, 2020; Xie et al., 2020b). The minimum limit value of Acceptable Alpha, more significant than 0.7, was used in prior studies (Wang et al., 2019; Xie et al., 2020b; Zaman et al., 2019). To accept the minimum sample for testing the hypothesis, the number of research samples followed the R-square method guidelines (Hair et al., 2014; Jr. et al., 2021). According to Hair et al. (2014, p. 21), the R-square method calculates the number of hypotheses tested with the minimum R-square chosen. The result of calculating the minimum sample to test the hypothesis was 181 samples. Another study recommended a sample size of 181 to achieve a valid and adequate test

using multivariate statistical analysis (Kock, 2018). The survey collected 209 responses over a period of three months. Before testing the SmartPLS application, we conducted a first test to select outlier data and eliminate the data. The second PLS algorithm test seeks to analyze the selected data.

## Results and Discussions

### Respondent Information

Data were collected for three months, and 209 responses were obtained. However, the first PLS Algorithm testing phase found as many as nine data points as outlier data, and 200 data were analyzed for research purposes using SmartPLS software. The results of the descriptive analysis are presented in **Table 2**. Descriptive analysis was used to assess the characteristics of the sampling data distribution according to the sample distribution and provide preliminary knowledge about the characteristics of the respondents. The percentage of male respondents was 45.00%, whereas that of female respondents was 55.00%. The majority were by ages between 18-27 (55.00%) and 28-37 (28.00%). The age distribution of the respondents is in line with the percentage of the Indonesian population that is bad on generation. According to Jayani (2021), the Indonesian population is dominated by the "Gen Z" group (27.94%) and the millennial generation is 25.87%. According to Sádaba (2016), the age distribution of respondents is also included in the category of "young people, " who are the younger generation born in an era of technological development. This factor may explain why these groups dominate the respondents' information. Most of the respondents were undergraduates (69.00%) and postgraduates (18.50 %), while respondents with high school or lower education levels were 12.50%. Most respondents agreed to use Peduli Lindungi to access health services for Scan QR Code (56.50%), accessing COVID-19 Vaccine services (17.50%), while the least used service is "COVID-19 Statistic" (1.50%).

**Table 2.**  
**respondent information**

Item	Category	Frequency	Percentage (%)
Gender	Male	90	45.00
	Female	110	55.00
Age	< 17 years old	22	11.00
	18-27	110	55.00
	28-37	56	28.00
	< 38 years old	12	6.00
Education	High School or Less	25	12.50
	Undergraduate	138	69.00
	Postgraduate	37	18.50
Most used services	COVID-19 Vaccine	35	17.50
	COVID-19 Test Results	33	16.50
	EHAC	12	6.00
	Travel Regulation	4	2.00
	Scan QR Code	113	56.50
	COVID-19 Statistic	3	1.50

Source: primary data collection

### Measurement Model

Structural equation modeling was applied using SmartPLS software to analyze the research data. To confirm the adequate measures, tests were conducted to demonstrate the validity of the model constructs for the total sample. Many experts have proposed ways of assessing the quality of the measurement model, which is determined in several ways: 1) convergent validity (CV) relates to whether or not various methodologies may be employed to measure the same scale constructs. In general, if the following requirements are satisfied, CV is acceptable: statistically significant factor loadings  $>0.7$ , construct reliability (CR)  $>0.7$ , and average variance extracted (AVE)  $>0.5$ . 2) Discriminant validity (DV) is the difference between one latent variable and another. The degree of good discriminant validity was calculated by comparing the value of the square root of each construct of the AVE, which was greater than the correlation coefficient between the construct and all other constructs. 3) Construct reliability (CR) denotes the measurement consistency. This value should be greater than 0.7. **Table 3** presents the values of the loading factor test results for each construct item. Convergent validity was determined based

on the loading factor and AVE, while reliability was determined based on CR and CA, as shown in **Table 3**. The results showed that all the constructs achieved an acceptable score that exceeded the threshold. In the next stage, discriminant validity was measured using the Fornell-Larker criterion test, as shown in **Table 4**. The results confirmed discriminant validity through AVE, and each latent construct was superior to the highest squared correlation of the construct with other latent constructs. Loading Factors were defined for each item of the construct. The results showed that all the factor loading values met the threshold value of 0.70.

### Structural Model

**Figure 3** shows nine paths in the structural model and **Table 5** shows the results of testing

**Table 3.**  
**Convergent Validity and Reliability**

Construct	Indicators	Convergent Validity		Reliability	
		Loading ( $>0.7$ )	AVE ( $>0.5$ )	CR ( $>0.7$ )	CA ( $>0.7$ )
IU	IU1	0.916	0.723	0.887	0.806
	IU2	0.848			
	IU3	0.782			
Satis	Satis1	0.803	0.652	0.904	0.866
	Satis2	0.833			
	Satis3	0.773			
	Satis4	0.770			
	Satis5	0.857			
PU	PU1	0.827	0.728	0.915	0.875
	PU2	0.836			
	PU3	0.919			
	PU4	0.827			
PEOU	PEOU1	0.840	0.676	0.893	0.842
	PEOU2	0.821			
	PEOU3	0.754			
	PEOU4	0.871			
EC	EC1	0.869	7.95	0.921	0.871
	EC2	0.920			
	EC3	0.885			

Note: IU is intention use of Peduli Lindungi, Satis is user satisfaction, PU is perceived usefulness, PEOU is perceived ease of use, EC is expectation confirmation.

Source: The SmartPLS data processing software's output



**Table 4.**  
**Discriminant Validity Result: Fornell-Larker's Criterion**

	EC	IU	PEOU	PU	Satis	Discriminant Validity
EC	<b>0.892</b>					Valid
IU	0.742	<b>0.851</b>				Valid
PEOU	0.519	0.609	<b>0.822</b>			Valid
PU	0.674	0.708	0.470	<b>0.853</b>		Valid
Satis	0.804	0.754	0.664	0.712	<b>0.808</b>	Valid

*Source: The SmartPLS data processing software's output*

the proposed hypothesis. All the hypotheses were supported (H1, H2, H3, H4, H5, H6, H7, H8, and H9). The results show that satis significantly affects IU ( $\beta = 0.377$ ,  $t\text{-value} = 4.434$ ,  $p\text{-value} = 0.000$ ). PU significantly affected IU ( $\beta = 0.347$ ,  $t\text{-value} = 4.639$ ,  $p\text{-value} = 0.000$ ). PEOU had a significant effect on IU ( $\beta = 0.196$ ,  $t\text{-value} = 3.134$ ,  $p = 0.002$ ). where the value of R2 in IU is 0.649, and all latent variables (PU, PEOU, and Satis) affect 64.9% of IU. The test results also proved that PU had a significant impact on satis ( $\beta = 0.246$ ,  $t\text{-value} = 4.167$ ,  $p\text{-value} = 0.000$ ). The effect of PEOU on Satis was not significant ( $\beta = 0.297$ , with  $t\text{-value} = 5.843$ ,  $p\text{-value} = 0.000$ ). EC had a significant impact on Satis ( $\beta = 0.484$ ,  $t\text{-value} = 8.126$ ,  $p\text{-value} = 0.000$ ). When the value of R2 in Satis is 0.762, all latent variables (PU, PEOU, and EC) affect 76.2% of Satis. In addition, the test results showed that the effect of PEOU on PU was significant ( $\beta = 0.165$ ,  $t = 2.332$ ,  $p = 0.020$ ). The effects of EC on PU were significant ( $\beta = 0.588$ ,  $t\text{-value} = 7.204$ ,  $p\text{-value} = 0.000$ ). The value of R2 for PU is 0.474, which means that PEOU and EC explain 47.4% of PU. An interesting test result showed that the effects of EC on PEOU were significant ( $\beta = 0.519$ ,  $t = 10.667$ ,  $p = 0.000$ ). The value of R2 for PEOU is 0.269, which means that EC explains 26.9% of PEOU.

This research aims to develop a model (TAM and ECM) that can predict individual user behavior when obtaining m-government services and examine the foundations of factor analysis. Based on the research findings, all hypotheses were supported. The results showed that Satisfaction, Perceived Ease to Use and

**Table 5.**  
**Hypothesis Testing Results**

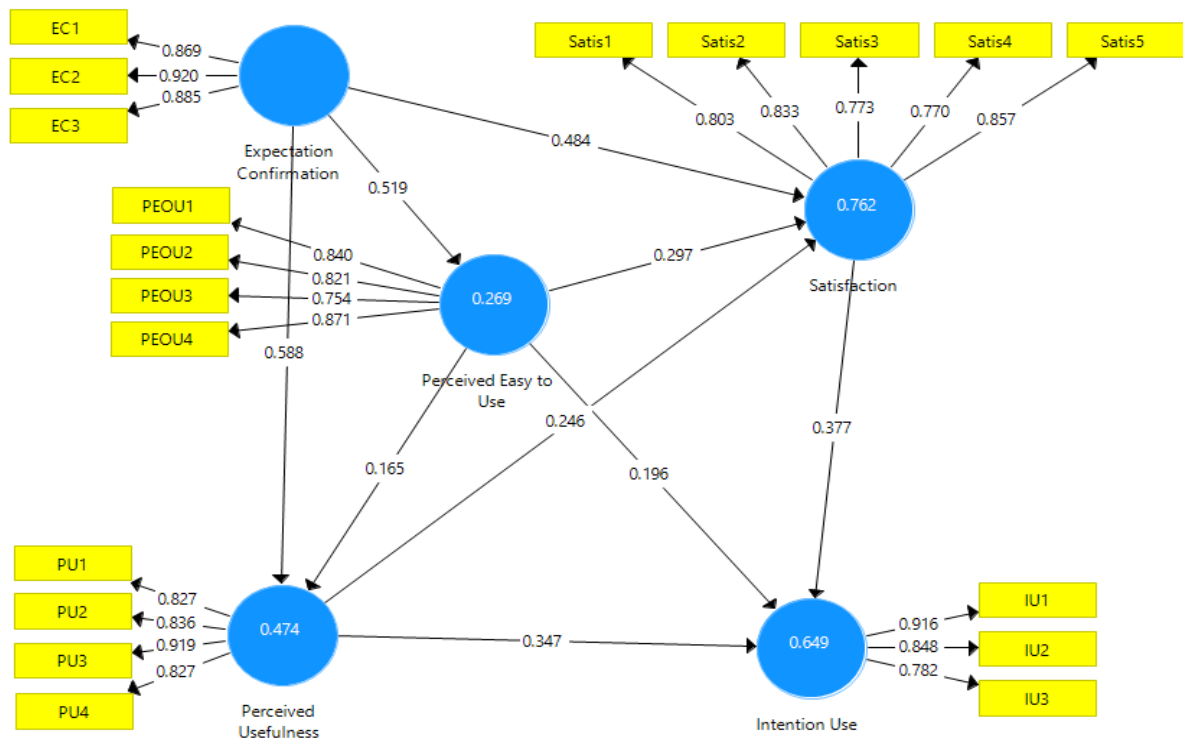
Hypothesis Path	$\beta$	$t\text{-value}$	$p\text{-value}$	Supported
H1: Satis → IU	0.377	4.434	0.000*	Supported
H2: PU → IU	0.347	4.639	0.000*	Supported
H3: PEOU → IU	0.196	3.134	0.002**	Supported
H4: PU → Satis	0.246	4.167	0.000*	Supported
H5: PEOU → Satis	0.297	5.843	0.000*	Supported
H6: EC → Satis	0.484	8.126	0.000*	Supported
H7: PEOU → PU	0.165	2.332	0.020***	Supported
H8: EC → PEOU	0.519	10.667	0.000*	Supported
H9: EC → PU	0.588	7.204	0.000*	Supported

*Note: \*, \*\*, and \*\*\* indicate significance at  $p < 0.001$ ,  $p < 0.005$ , and  $p < 0.05$ , respectively.*

*Source: The SmartPLS data processing software's output*

Perceived Usefulness strongly predicted Intention to Use (H1, H2, and H3). The subjective assessment factors of the benefits and convenience of the new technology are perceived ease of use and perceived usefulness (Wirtz et al., 2019). At the same time, users expect new technologies to “add value” to meet their needs for e-government services. In addition, technology enables users to accomplish given tasks faster, enhances job performance, boosts productivity, raises work effectiveness, and makes work more comfortable (Davis, 1989). The third factor drives intention to use e-government services. The third factor also reflects the user's behavioral intent when it comes to adopting information technology. These findings are consistent with those of previous studies (Eid and Selim, 2020; Sarassina, 2022; Wirtz et al., 2019; Xie et al., 2020). Thus, the increase in individual behavioral intentions toward accepting technology is substantially

**Figure 3.**  
**Path coefficient test results**



Source: The SmartPLS data processing software's output

influenced by perceived ease of use, usefulness, and satisfaction. The study results show individual behavioral intentions in obtaining health services through Peduli Lindungi applications, because m-government services are considered easy to use, useful, and meet user needs. However, this shows the government's performance in providing good health services.

On the other hand, the findings show that perceived ease of use significantly affects perceived usefulness (H7). Perceived ease of use refers to the user's efforts to learn and use technology (Davis, 1989), whereas perceived usefulness focuses on enhancing performance through technology (Davis, 1989). The analysis of variance suggests that user interface design influences the association between perceived ease of use and perceived usefulness by 43% (Cho & Hung, 2009). The research findings on the influence of PEOU on PU align with those of previous research (Cho & Hung, 2009; Xie et al.,

2020b). Research (Xie et al., 2020b) shows that the easy use of shared-nurse innovations can increase their usefulness in health services. The test results show that the CR value is 6.888, with a p-value of less than 0.001, indicating that perceived ease of use strongly influences perceived usefulness. The assumption is that a governmental health service provides excellent benefits if citizens' efforts to obtain this service are minimal. This means that digital services require minimal effort because the operation is designed to be easy to use. Consequently, the benefits of using digital services are also very high. Therefore, the relationship between perceived ease of use and perceived usefulness is justified by the assumption that the less effort required to use a digital service, the more valuable it is.

Furthermore, PU, PEOU, and EC significantly affected satiation (H4, H5, and H6). This study confirms that the TAM variables, including PU and PEOU, encourage user satisfaction with the

"Peduli Lindungi" m-government health service in accessing health services. This shows that digital services can build perceptions of usefulness and convenience at a positive level, significantly impacting Peduli Lindungi user satisfaction. These results indicate that the satisfaction level of m-health application users will increase if they are satisfied with the technology, which is easy and useful to use. In particular, the perceived benefits of digital services positively impact satisfaction with digital services. There is "added value" gained, or even users feel that there is an increase in performance when using digital services. Consequently, satisfaction with digital services has increased. The results of this study explain how perceived usefulness and ease-of-use significantly affect user satisfaction. The findings of this study show a positive influence between PEOU and Satis, in line with previous research (Xie et al., 2020), while the positive influence between PU and Satis is in line with previous research (Wilson et al., 2021). TAM variables positively affect satis, in line with previous research (Sarassina, 2022a). According to Wilson et al. (2021), technology features should be easy for consumers because it will increase their learning of technology features. This study also revealed unexpected results regarding satisfaction with the use of m-government health services. User satisfaction describes the psychological state that a user feels after meeting his/her expectations. In comparison, the confirmation of expectations is an element of objective judgment between expected and actual experience. A better level of expectation-confirmation has a positive relationship with user satisfaction. However, user expectations that still need to be met (disconfirmed) will decrease user satisfaction levels. The results show a value of 0.484, with t-value = 8.126 and p-value = 0.000, indicating that confirmation of expectations is a predictor variable that significantly influences user satisfaction. This means that respondents considered digital services to meet expectations

in conducting health service transactions. Consequently, digital services provide much better user satisfaction. The results of this study contribute to explaining the user expectations that can affect digital service satisfaction.

These findings also show expectation confirmation as a predictor variable that significantly affects perceived ease of use and perceived usefulness (H8 and H9). Expectation confirmation refers to an element of individual subjective judgment that refers to the user's initial expectations before using digital services with the user's real experience in using digital services. Confirmatory expectation is a predictor variable that strongly influences high user expectations in digital services. In turn, perceived ease of use and usefulness increase if the user's initial expectations are met after using digital services. In other words, expectation-confirmation has a positive relationship with perceived ease of use and perceived benefits. This finding also aligns with previous research (Xie et al., 2020b), and ease of use and usefulness can provide real experiences that are better than expectations. The results showed that EC had a significant effect on PEOU by 0.519, with t-value = 10.667, p-value = 0.000, while EC had an effect on PU ( $\beta = 0.588$ , t-value = 7.204, p-value = 0.000). It means that respondents considered that user expectations for the "Peduli Lindungi" digital service increased perceived ease of use and perceived benefits of using the Peduli Lindungi application. The assumption is that users expect to transact with the government through digital services to obtain ease of transaction and much better benefits. The results of this study contribute to explaining user expectations that can influence user ratings for the ease of use and usability of digital services.

## Conclusion

This study analyzed the factors influencing users' intention to use Peduli Lindungi. The measurement shows the proposed model,

integrating TAM and ECM, have adequate reliability and validity. The proposed structured-equation model fits this model. Based on this analysis, the integration model of TAM and ECM can explain user behavior using digital services, especially the Peduli Lindungi application. Implementing the Peduli Lindungi application shows that the government has successfully provided health services that meet the demands and needs of its citizens. The research findings reveal that all proposed critical factors influence the success of government digital services. The Peduli Lindungi application is presented by the government and is effective and efficient in helping the government carry out digital contact tracing amid the spread of COVID-19. The successful adoption of e-government services also provides positive feedback on the government, namely, building and increasing public value, trust, and perception of the government. Therefore, the digital service approach is a powerful strategy for enhancing the government's reputation and increasing its legitimacy (Maznorbalia & Awalluddin, 2020).

This study also offers a research contributes to the future growth of research. First, this research adds to the more comprehensive literature. This research shows that previous studies focus on using specific theoretical models in the context of mobile health services. The continuous use of digital services starts with the user's curiosity, which encourages the user to use them. As a result, the user judges whether the user's initial expectations are met. Therefore, the second contribution is that this research validates the contextual model, TAM, and ECM as theoretical contributions. The TAM is built from PU and PEOU variables (Davis, 1989), which are technological factors (Dwivedi et al., 2019). It encourages the TAM model to be investigated from broader perspectives, such as those offered by the ECM, in investigating subjective elements of user satisfaction. The two theoretical models, which have similarities and differences, are solutions

that can be integrated to evaluate the critical factors that affect users' behavioral intention to accept digital services, both technically and user expectations.

Several suggestions have been offered to improve the quality of m-government health services. The results of this study provide essential evidence for the central government and ministries to develop applications to ensure that the technology is implemented. Technology will make it easier for citizens to learn and ensure that it can improve service performance effectively and efficiently. The ease of use of these features has fatal consequences for user acceptance or rejection of the digital services provided. Therefore, increasing the ease of access and usefulness of Peduli Lindungi applications is necessary. As application developers, the Ministry of Communication and Informatics and COVID-19 Handling Committee can conduct accessibility audits to assess the convenience of government digital services. According to Huda et al. (2022), accessibility audit methods can be performed using Web content accessibility guidelines, functional accessibility evaluators, and Nielson usability guidelines. Accessibility audit activities are also a preventive action by the government to prevent problems related to trust, suitability, personalization, and accessibility (Shemesh & Barnoy, 2020). The central government and ministries that develop applications must pay attention to the "added value" of the technology being implemented. Digital services must focus on citizens' needs. The resulting "added value" can build a positive perception of citizens that digital services provide better benefits than traditional services. Added value is also a fundamental reason motivating them to continue sustainably using digital services. Ultimately, this would improve the image of the central government in providing digital services.

Although the research contribution is significant in filling the gap in the literature

on m-government health services, there are undeniable limitations. First, it examines the digital healthcare sector in Indonesia. Due to the differences in country settings, the findings of this study need to be more generalizable to other nations. Further research is needed to re-examine the association between these factors in other nations. The number of samples used in the PLS Algorithm testing was 200. This number does not represent the characteristics of the population of Peduli Lindungi. The interpretation and generalization of the research findings may have been affected. A larger sample size is recommended for future research using a similar model. Subsequently, the proposed research model to predict individual behavior toward adopting and accepting m-government services may need to be able to generalize critical user factors as a whole. Future research may consider other theoretical models or add other variables to construct its research construct to empirically investigate the factors that influence the use of m-government health services. Third, the proposed research model can be used in future studies. However, these findings may vary.

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