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Medical Technology and Public Health Journal

Journal Home Page: https://journal2.unusa.ac.id/index.php/MTPHJ

Research Article

Assessing the Acceptance Surveillance Information System for Public Health Centre (SISPHEC.ID Application) using Technology Acceptance Model (TAM) at Kuningan District, Indonesia

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***DOI:** 10.33086/mtphj.v7i1.4097*

Article History:
Received, April 06th, 2023
Revised, June 01st, 2023
Accepted, June 08th, 2023
Available Online: June 10th, 2023

Please cite this article as:
Heriana, Cecep et. al., "Assessing the Acceptance Surveillance Information System for Public Health Centre (SISPHEC.ID Application) using Technology Acceptance Model (TAM) at Kuningan District, Indonesia" Register: Medical Technology and Public Health Journal, Vol. 7, No. 1, pp. 89-97, 2023

ABSTRACT

One of the vigilance efforts against the next stage of the COVID-19 pandemic is strengthening surveillance information systems. Using the Public Health Centres surveillance information system (Sisphec.id) is essential in determining policies, but it needs to be tested for acceptance. This study aims to examine the use and acceptance of the Public Health Centre surveillance information system for COVID-19 with applications in Kuningan Regency. This quantitative descriptive study was conducted in Kuningan Regency from October 26 to November 26, 2022. The population was 37 Public Health Centre surveillance officers and a sample of 20 respondents. Descriptive data analysis with Tableau public application and STATA 16. Result: perceived Ease of Use for applications is 85% is perceived as good. The perceived usefulness is 65% perceived as good. Social factors of users related to the application are 85% perceived as, the behavioural interest variable for using the application 90% is perceived as good, facility conditions affecting users, 90% perceived as good, usage behaviour 65% is perceived as good. The conclusion is most perceived as good for all TAM indicators, namely perceived Ease of Use, perceived usefulness, social factor variables of users, behavioural interest, variable facility conditions affecting users and usage behaviour. The recommended application sisphec.id can be used to support the Covid-19 surveillance system at Public Health Centre in Indonesia.

***Keywords:** Surveillance Information System, Technology Acceptance Model, Covid-19*

INTRODUCTION

The Covid-19 pandemic since 2020 is still a global problem because of the high number of cases. As of November 2022, more than 760 million people have been infected, and more than 6 million have died. (WHO, 2023). Covid-19 control is carried out by various countries, including by imposing strict quarantine rules in big cities, small towns and public areas around the world to prevent further spread (Srinivasa Rao & Vazquez, 2020). Covid-19 poses unprecedented challenges for governments and communities worldwide (Chinazzi et al., 2020). WHO recommendations:

Isolation and mobility restriction have been effective in containing and reducing the spread of infection (Brooks et al., 2020). This step allows more time to prepare for the next phase of the pandemic and avoid health system saturation.(Velicia-Martin, Cabrera-Sanchez, Gil-Cordero, & Palos-Sanchez, 2021). Preparation for the next phase of the pandemic is a form of early vigilance in facing public health risks that arise in the future. Vigilance is one of the pillars of the surveillance and response system, namely, implementing immediate and planned responses.

Surveillance systems need to be supported by information systems that are appropriate, fast and can be used by users in health facilities. The Covid-19 surveillance information system in Indonesia used is the Sistem Informasi Pelacakan Kasus (SILACAK) or Case Tracing Information Systems application for case tracing and New All Record (NAR) for the input of confirmed case data from health facilities and laboratories, and Sistem Pelaporan Harian (SILAPHAR) or Daily Report Systems to report daily cases from Public Health Centre to the Ministry of Health. Stages in surveillance after getting suspects and positive cases and tracing cases are immediately carried out, which are inputted in the SILACAK Application and reported by decision-makers. Actual cases are found in a region based on the New All Record (NAR) case of the Ministry of Health, coupled with cases of patient self-reports in the region that are not in the national reporting system (NAR). In the 33rd week, data in Java, NAR cases compared to actual cases difference of 29.60% (3061 NAR cases and 4349 actual cases), while outside Java (including Bali), the difference of 7.9% (2332 NAR cases and 2531 actual cases). In the 34th week, data on the island of Java NAR cases compared to the actual amount of 45.54% (3501 cases) while outside Java the percentage difference was -1.48% (-98 cases). In the 36th week, data on the island of Java, NAR cases compared to actual cases difference of 29.60% (3061 cases of NAR and 4349 actual cases), while outside Java (including Bali) difference of 7.9% (2332 cases of NAR and 2531 actual cases). (Task Force Team, 2021).

Based on the data, showing cases not recorded in NAR on Java Island are more significant than those outside Java Island. It happens because the intervention area is more in Java, and the number of new confirmed cases of covid-19 in Java still dominates the total cases that occur in Indonesia. Evaluation of the implementation of daily reports with SILAPHAR application, starting on August 1, 2020, until September 20, 2020, at 14:00 (51 days). Daily reports reached 16,662 from 446 districts/cities (34 provinces). In percent, the completeness of daily reports for 51 days is 63.56% which is still below the national target of 80%. Provinces that have achieved reporting above 80% until September 20, 2020, as many as 12 provinces, provinces with completeness above 10% but less than 80%, as many as 19 provinces, and provinces with completeness under 10% as many as 3 provinces *(MoH, 2020).*

One factor affecting surveillance performance by using an app is the level of application acceptance by the user. Increased accessibility, enhanced care, usefulness, ease of use, and privacy/discomfort are decisive variables affecting technology acceptance (An, You, Park, & Lee, 2021). Based on research results, the acceptance rate of SILACAK application by the Public Health Centre shows that SILACAK application is a helpful media for COVID-19 recording and reporting. This application is easy to learn but still needs improvement and development on several sides. Such as SILACAK still needs to meet the criteria to increase productivity due to the many systems used for reporting COVID-19. This data storage process is considered long enough due to frequent technical glitches. SILACAK still needs to meet the fast system response time because users often feel SILACAK has too long a system response time. In the SILACAK application, control indicators are less felt because officers have to contact the data manager to restore the data that has been sent. (Negari & Eryando, 2021). In implementing surveillance for case search and close contact using SILACAK application in Indonesia, there are still differences between actual cases and manual

recording. The number of daily cases from the first and third weeks inputted SILACAK is less than manual data (Heriana, Faridah, & Rana, 2021).

A factor that influences the achievement of surveillance quality is integrated data support. Data integration between surveillance units (Public Health Centres, Polyclinics, Hospitals) must be managed and designed correctly to enable health leaders and analysts to obtain, integrate, analyze and monitor data (cases of disease) from different data sources (surveillance units). Facilitating surveillance data management requires data Centre design in the epidemiological data warehouse model to form an integrated surveillance system (Budiman, N, & Muslih, 2015). Integrated digital surveillance includes surveillance, testing, contact tracing, quarantine, and health care activities. (Wang, Su, Zhang, & Li, 2021). As support for the surveillance system at Public Health Centre, a SISPHEC.ID application has been developed to present data management support applications at the Public Health Centre level so that the analysis results can be immediately conveyed to decision-makers. The supporting application is sisphec.id, a digital platform for digital transformation from the Ministry of Health. Sisphec.id is used at the Public Health Centre level to be able to manage data based on epidemiological indicators which is the first surveillance system platform which develops epidemiological indicators for case transmission networks in the form of epidemiological cluster analysis, namely epi-contact and time approach (epidemic curve), place (case map based on Public Health Centre and its work area). As these apps have the potential to be used by Public Health Centre surveillance officers, factors that indicate an intention to use and adopt these types of apps by users should be investigated (Kaspar, 2020).

MATERIAL AND METHODS

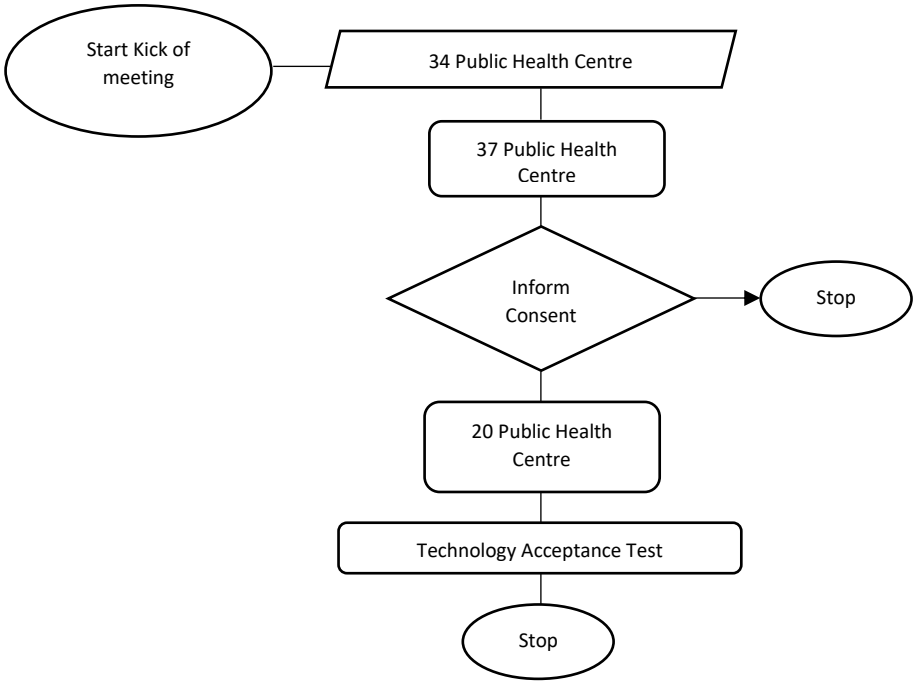

Figure 1. Technology Acceptance Test Flow Chart

Quantitative descriptive research design with an evaluation approach using the Technology Acceptance Model, which was previously given training on using sisphec.id applications and carried out acceptance tests. The research was conducted in Kuningan Regency from October 26, 2022, to November 26, 2022. The study utilized a total number of Public Health Centres in Kuningan District. Of the 37 retrieved Public Health Centres, 20 (54.05%) were included based on the completeness and inclusion criteria. The inclusion criteria are attending the training and signing

informed consent. Exclusion criteria are limited internet access. The flow of participation can be seen in Figure 1.

Variables in this study are the characteristics of respondents' age, sex and job. Variables TAM Indicators are Perceived Usefulness (PU), Perceived Ease of Use (PEU), social factors, intention to use, facilitating conditions and usage behaviours. Descriptive data analysis was carried out with the frequency distribution of each TAM indicator and its categories (Good, Fair and Poor) presented in tabular form. The instrument used is the Technology Acceptance Model (TAM) Questionnaire (Davis, 1985) —data analysis using the Tableu Public application and STATA.16.

RESULTS AND DISCUSSION

Result

Before conducting acceptance tests on the sisphec.id application by Public Health Centre Surveillance personnel, two preliminary activities were carried out, namely, conducting discussions for kick-of-meetings and training on the use of sisphec.id applications with the Head of Disease Prevention and Control, surveillance section, Public Health Office, and Public Health Centre Surveillance Officer. At this meeting, the mechanism for implementing the sisphec.id application for Covid-19 at the Kuningan Regency Public Health Centre and training tutorials on the use of the sisphec.id application was discussed. At this meeting, support was obtained from the Public Health Office and Public Health Centre for the implementation of research. The training was held on October 26, 2022, and was attended by 37 Public Health Centre Surveillance Officers from 17 Sub-District (Figure.2).

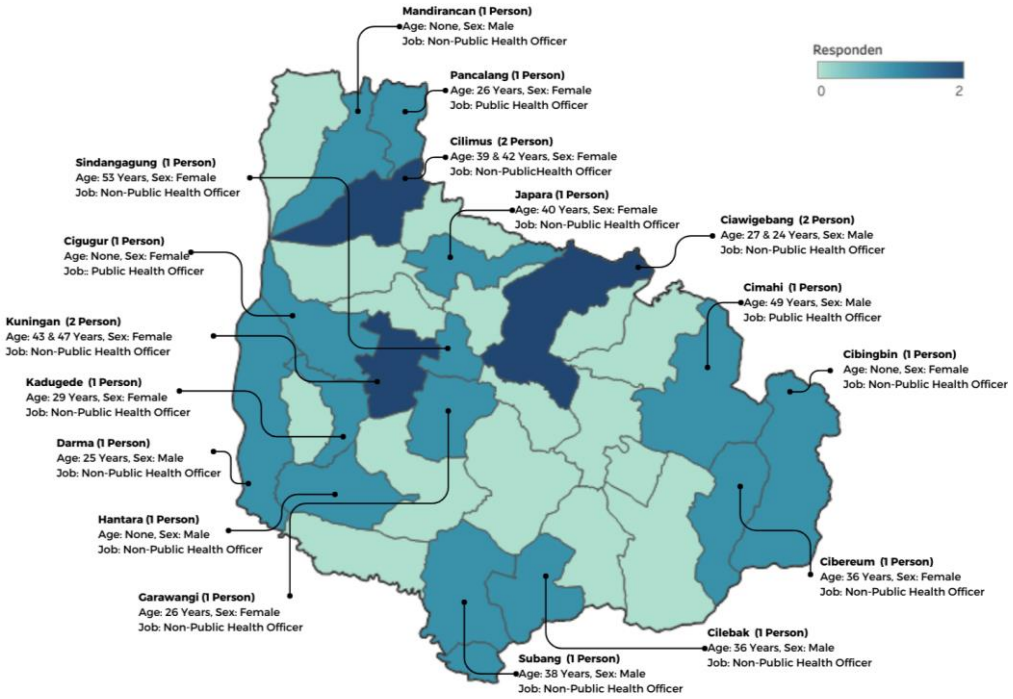

Figure 2. Respondents' Distribution Based on Characteristic

Characteristics of respondents, based on Table 1, show the gender variable. For most women (65%), age variables are primarily between 31 and 45 years old (35%) and variable types of work as Non-Public Health Officers (85%).

Table 1. Characteristic of The Sample (n=20)

No.	Variable	Frequency	%
1.	Sex		
	Male	7	(35%)
	Female	13	(65%)
2.	Age		
	Between 18 and 30	6	(30%)
	Between 31 and 45	7	(35%)
	>47	3	(15%)
	None	4	(20%)
3.	Job		
	Public Health Officer	3	(15%)
	Non-Public Health Officer	17	(85%)

Before the training, participants were asked to have an internet connection, open a http://sisphec.id/ website, video tutorials, and usage modules. After that, the ability of surveillance personnel from the Public Health Centre can use the sisphec.id application, the acceptance test begins and tests the application's use. This test began to be carried out on November 26, 2022, considering that reporting began to be calculated from the 26th and closed every 25th. Surveillance Personnel's acceptance test of the use of Sisphec.id application using the Technology Acceptance Model (TAM), which consists of a utilization perspective, ease of use perspective, social factors, behavioural interest/intention to use, conditions that facilitate users, and the use of the system in daily work with the following results (Table 2).

Table 2. Result of Descriptive Analysis of Technology Acceptance Model

No.	TAM Indicators	Category					
		Good		Fair		Poor	
		n	%	n	%	n	%
1.	Perceived usefulness (PU)	17	(85%)	3	(15%)	0	(0%)
2.	Perceived ease of use (PEU)	13	(65%)	7	(35%)	0	(0%)
3.	Social Factor	17	(85%)	3	(15%)	0	(0%)
4.	Intention to use	18	(90%)	2	(10%)	0	(0%)
5.	Facilitating Condition	18	(90%)	2	(10%)	0	(0%)
6.	Usage Behavior	13	(65%)	7	(35%)	0	(0%)

Table 2. shows descriptive statistics for each of the variables used in this study that perceived Ease of Use for applications sisphec.id 65% is perceived as good, and 35% is perceived as sufficient. The perceived usefulness variable is 85% perceived as good, and 15% is perceived as sufficient. The social factor variables of users related to the application sisphec.id are 85% perceived as good and 15% perceived as sufficient. The behavioural interest variable for using the application sisphec.id (Behavioural Intention to use), 90% is perceived as good, and 10% as sufficient. Variable facility conditions affecting users, 90% perceived as good and 10% perceived as sufficient. Regarding the Usage behaviour variable, 65% is perceived as good, and 35% is perceived as sufficient.

Discussion

The perception of convenience is the level at which one believes technology can get work done more efficiently. Indicators of the perception of the ease of information technology include easy-to-understand, easy-to-use, controllable, and flexible. The perception of ease of use as a core component determines the system's overall usability and is one of the dimensions that can contribute to adopting new information systems (Carroll et al., 2017). The acceptance test results showed that of perceived Ease of Use for the www.sisphec.id application, 65% perceived it as good, and 35% perceived it as sufficient. The result is that the input process in the application can be imported from MS Excel and can analyze data online for various epidemiological indicators.

The results of the study are in line with the fact that contact tracing application, namely SILACAK, has a perception of convenience, an indicator that is felt to be quite good by users is the ease of learning, using, and flexibility of the SILACAK application, while the indicator that is still felt to be lacking is that the SILACAK application is not easy to control. (Negari & Eryando, 2021). The perceived ease of application significantly directly affects the attitude, leading to the intention to use, actual use and perceived usability (Chuenyindee et al., 2022).

The results showed that in the variable of user usefulness (perceived usefulness), 85% was perceived as good, and 15% was perceived as sufficient. The benefits of the www.*sisphec.id* application can help process data online and visualize it by epidemiological and surveillance indicators so that it does not process data manually. The provider's confidence influences the perceived usefulness of the technology in its ability to provide features according to needs (Terry & Buntoro, 2021). The study results align with (Negari & Eryando, 2021) that the contact tracing application, SILACAK, has a perception of usefulness, an indicator of perceived usefulness that has been considered quite good is performance and effectiveness of performance, simplifying user work, and the benefits of the system as a whole. (Negari & Eryando, 2021).

The study results for user social factor variables related to the application www.sisphec.id were 85% perceived as good and 15% perceived as sufficient. The perceived usefulness and convenience so that users convey to their colleagues so that they can continue to be used. In addition, the desire to use this application is due to hearing from colleagues that the application www.sisphec.id make work easier. The influence of colleagues is essential so that the use of the application can be used even more by surveillance officers. Perceived ease of use, social and influence, and intention to use positively affect attitudes towards the application (Vahdat, Alizadeh, Quach, & Hamelin, 2021)

The behavioral interest variable for using the application www.sisphec.id (behavioral intention to use), 90% is perceived as good and 10% is perceived as sufficient. The www.sisphec.id application does not replace existing applications but completes the surveillance process to process data. The results of this study align with (Walrave, Waeterloos, & Ponnet, 2020) as many as 48.7% of respondents indicated that they intend to use a Covid-19 tracking app because of the perceived benefits of the app. The intention to use the application will be determined by the perceived utility of the application (Velicia-Martin et al., 2021).

The acceptance of digital surveillance technology for infectious diseases is very dependent on the situation, such as facilities, policies and during a pandemic, there is greater tolerance for digital-based surveillance systems. (Degeling et al., 2020). Variable facility conditions affecting users, 90% perceived as good and 10% perceived as sufficient. The respondents are Public Health Centres surveillance officers who have supporting facilities for surveillance activities, namely computers and internet networks. In line with the research, 70% have computer facilities to support the implementation of surveillance in the Public Health Centre (Syairaji & Santoso, 2019).

Concerning usage behaviour variables, 65% is perceived as good and 35% as sufficient. The result is due to the ease felt and the usefulness felt by users towards the www.sisphec.id application. Perceived ease of use (PEU) and perceived usefulness (PU) are less likely to be correlated with actual usage.(Vahdat et al., 2021). In line with the research (Chuenyindee et al., 2022), perceived ease of use and perceived usability were found to significantly influence attitudes towards the use of applications, which further led to the intention to use and actual use of the system. Finally, the actual use of the system was well received on the perceived usefulness. If people understand the app's severity and advantages, they will likely consider it.

CONCLUSION AND SUGGESTION

This study concludes that TAM is perceived chiefly as good for all TAM indicators, namely perceived Ease of Use, perceived usefulness, social factor variables of users, behavioural interest, variable facility conditions affecting users and usage behaviour. The recommended application www.sisphec.id can be used to support the Covid-19 surveillance system at Public Health Centre in Indonesia.

ACKNOWLEDGEMENT

Acknowledgements of Bhakti Husada Foundation, Rectors of Institute of Health Science Kuningan, District Health Office Kuningan and Lincoln University College.

CONFLICT OF INTEREST

Not Conflict of Interest.

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