MOBILE PRESENCE BASED ULM EMPLOYEE LOCATION MONITORING SYSTEM

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Abstract

ULM attendance is usually done in each faculty using a fingerprint-based attendance machine. However, fingerprint-based presence during the pandemic is very dangerous due to the COVID-19 outbreak which allows the spread of the virus to be transmitted through finger intermediaries who use the presence machine simultaneously. As well as the existence of a letter prohibiting going home issued by the MENPENRB regarding "Restrictions on traveling activities outside the region or homecoming activities or leave for ASN in an effort to prevent the spread of Covid-19". In this study, we use a smartphone-based electronic system to overcome fingerprint-based attendance problems in order to get an increase in terms of costs, and minimize the spread of the COVID-19 outbreak. By knowing how much profit can be achieved through investment in the application development that the researcher has proposed, it is necessary to conduct a feasibility study as a tool to help draw conclusions about what will be done electronically, a comparison will be made against the implementation of attendance in the previous year. . The operational costs required are Rp. 27,665,070, while the costs incurred for application development are Rp. 1,613,666, it can be seen that there is an implementation cost savings of Rp. 26,051,404, when the operational cost savings are included in the economic feasibility study, the Break-Event Point (BEP) and Return on Investment (ROI) values since the first year the application was implemented showed a positive value. Until the fourth year, ROI and BEP entered the feasible criteria so that from an Economic Feasibility point of view it could be seen that the application was economically feasible. And the application that is made is able to provide convenience in using the application as evidenced by validity and reliability tests.

***Keywords** : Mobile-Based Presence, Online Presence, Feasibility Study, Validity and Reliability Test.*

1. INTRODUCTION

In 2020 until now Indonesia is still being attacked by an outbreak of the infectious disease COVID-19. This is seen as very dangerous where the transmission of this virus is easily spread by physical touch. One of the prevention efforts that can be implemented by Indonesia is to provide an appeal to maintain distance and reduce crowding activities. During the Covid-19 pandemic, a number of companies have implemented the Work from Home (WFH) system. WFH itself is a concept where work is done from home.

Lambung Mangkurat University (ULM) is a university that was established on September 21, 1958, which is located in South Kalimantan. ULM has 11 faculties and 1 Postgraduate Program. According to PDDIKTI data, it was recorded that until October 2020 there were 1,250 permanent educators and 404 education staff at Lambung Mangkurat University (ULM). HR is a major component in the organization, of course, this HR is an important thing to pay attention to. These

various elements are usually monitored through presence media, but due to COVID-9 the conventional system can no longer be used and there is a government policy that requires employees to work three days at the office and two days at home (WFH). The government also accommodates this, namely by limiting activities for traveling outside the region, homecoming activities and leave according to the circular letter of the MENPANRB Number 49 of 2020.

Health and safety factors are factors that must be considered, if you want to re-employ employees in the office. In the current condition, it is hoped that new normal activities will be carried out as much as possible to reduce touching the surface of common objects directly or called touchless. This is done so that the spread of the virus can be stopped. The way that can be used to minimize employees from touching the surface of objects directly is by using gloves. However, the risk with the use of gloves is that employees cannot make attendance with fingerprints. The operational costs of maintaining fingerprint attendance machines are still quite expensive, and there are often mistakes made during scanning because the *fingerprint* scanner machine detects dirt on a person's fingerprint because there are many fingerprint marks attached to the scanner and wet because of the user's sweat, as well as the emission. direct sunlight which causes fingerprints to be difficult to identify and must be repeated. With the current conditions, where employees are required to work from home and new normal, of course, this system is no longer relevant to use, while the Civil Service and Legal Department requires attendance data to be sent once a week.

Online Presence is an alternative to making attendance during this pandemic. With Online Presence it will make it easier to collect attendance data where attendance data can be stored and make it easier to make work attendance reports, besides that by using a smartphone, the location of employee attendance can be tracked and it can be known whether the employee is going home or not based on the sub-district coordinate point polygon which is the area for presence. Online attendance can be done anywhere without queuing and can be done at home when working from home. In addition, with a location-based online presence system, employee attendance can be monitored whether the employee is going home or not. By using Feasibility Analysis to assess the feasibility of implementing a built system so as to get results in the form of a decision whether the system is feasible or not, to be used as a strong foundation for running the system.

2. RESEARCH METHODOLOGY

The method of developing this research system is using the Iterative Development model. Iterative Development is a system development model that is dynamic, which means that each stage or process of system development can be repeated if there are weaknesses or errors. Each stage of system development can be carried out in the form of a summary and incomplete, but at the end of the development a complete system will be obtained in the last development.

3. RESULTS AND DISCUSSION

3.1 Results

3.1.1 Application Implementation Results

In accordance with the MENPENRB regulations, namely restrictions on traveling outside the region and homecoming or leave activities for ASN in an effort to spread Covid-19. The Civil Service and Legal Department requested that attendance be done online to reduce the spread of Covid-19 and make it easier to track whether the employee or lecturer is going home. So, the Online Presence was held on May 19, 2020. The following are the results of the implementation to make it easier for the Civil Service and Legal Department to track the location of the presence, which can be seen in Figure 1.

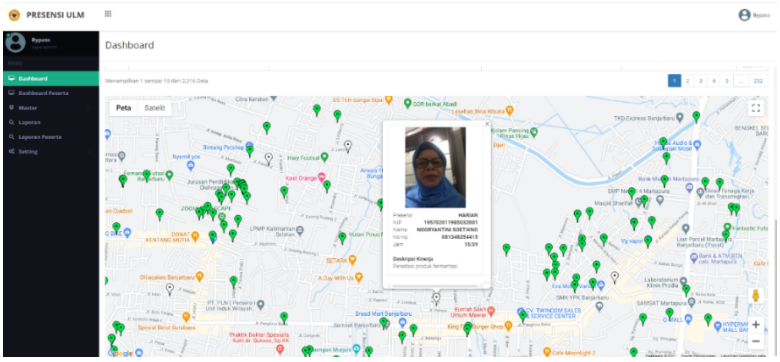

Figure 1. Screenshot of the Dashboard Advanced Page for Monitoring Presence Locations

3.1.2 Implementation Cost Results

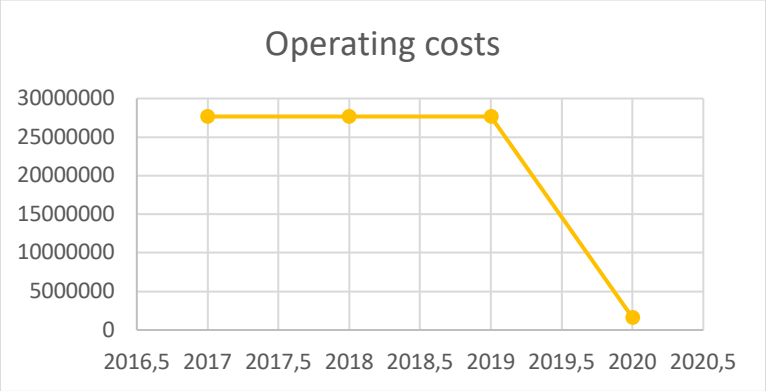

Figure 2. Graph of the percentage of implementation costs after implementation

Presence operational costs for 2017-2019 are Rp. 27,665,070 and operational cost data for 2020 is Rp. 1,613,666. If the operational costs in 2020 are Rp. 1,613,666 Rupiah then there is a cost savings of Rp. 26,051,404.

3.1.3 Validity and Reliability Test Results

In this test result, the researcher uses the IBM SPSS assistance application to test the validity and reliability of the existing questionnaire.

The following are aspects of the respondent's questionnaire for employees:

- Application Reliability
- Ease of Application
- Complete Features

- Personnel Service

a. Population

Population is the total number of a unit whose analysis and characteristics are expected to be used as a reference for certain characteristics. In this final project research, the population used is the number of employees and lecturers who are present in the Online Presence application in 2020 at ULM around 1,572 people.

b. Sample

In drawing the number of samples, researchers used the *Slovin* formula . To take the number of samples, can be seen in the formula below:

Margin of Error : 5%

Total population (N): 1,572

$$n = \frac{N}{1+Ne^2} = \frac{1572}{1+(1572).(0{,}05)^2} = \frac{1572}{1+3{,}93} = \frac{1572}{4{,}93} = 318{,}86$$

So, if rounded off, the number of samples is 319 people, which means 319 answers to the questionnaire used in this study.

c. Validity test

The validity analysis that will be used in this study uses respondent data, amounting to 319 employees at ULM. In testing the validity using the SPSS program using the *Bivariate Pearson* technique, it can be seen in Figure 3

Correlations

		X1	X2	X3	X4	Total
X1	Pearson Correlation	1	.874**	.898**	.885**	.956**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	319	319	319	319	319
X2	Pearson Correlation	.874**	1	.871**	.868**	.948**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	319	319	319	319	319
X3	Pearson Correlation	.898**	.871**	1	.896**	.960**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	319	319	319	319	319
X4	Pearson Correlation	.885**	.868**	.896**	1	.953**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	319	319	319	319	319
Total	Pearson Correlation	.956**	.948**	.960**	.953**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	319	319	319	319	319

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 3. Results of the Correlations Questionnaire using the IBM SPSS application

In figure 3. the total Sig. (2-tailed), when the value is less than the significance value of 5%, the questionnaire is declared valid (valid). If the value is greater than 5%, the questionnaire is declared invalid and the questionnaire can be omitted.

3.1.4 Satisfaction Questionnaire Results

In this study, it is intended to determine user satisfaction with the use of applications at ULM Presence. The distribution table of consumer satisfaction in the ULM Presence application is as follows:

Table 1. Results of the satisfaction questionnaire

Scale	Category	Frequency	%
1	Very Dissatisfied	4	1%
2	Not satisfied	13	4%
3	Less satisfied	31	10%
4	Satisfied	15	5%
5	Very satisfied		
Amount		316	99%

The results of table 2 when displayed in the form of a diagram will look as follows:

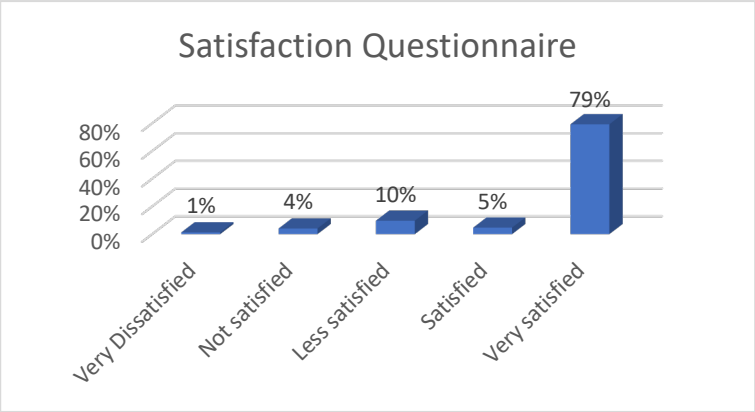

Figure 4. Distribution of Consumer Satisfaction on the Presence ULM application

3.1.5 Smartphone GPS Accuracy Test Results

At this stage the researchers tested the accuracy of GPS on Android smartphones. The aim is to find out whether the determination of GPS coordinates (latitude and longitude) in the ULM Presence application is carried out accurately. The test will be carried out by making a presence in several open and closed places because satellite signals are the main thing to get the accuracy of the coordinates.

As the search above, the author tries to do a test by doing a presence to get coordinate point data. The place for making attendance is in the UPT PTIK ULM Banjarbaru room. Natural conditions at that time were sunny at latitude -3.4460221 and longitude 114.8438007 coordinates with a location accuracy of 20 meters from the actual location of the presence.

Then the researchers tried to make a presence in a different place. The researcher made a presence at the Banjarbaru ULM Auditorium Building. The place for making attendance is outside the Banjarbaru ULM Auditorium Building. The natural conditions at that time were cloudy at the latitude coordinates of -3,44,37918 and longitude 114,8466405 with a location accuracy of 20 meters from the actual location of the presence.

Then the researchers tried to make a presence in a different place. The researcher made a presence at RM. Denai Banjarbaru. The place to do attendance is outside the RM room. Denai Banjarbaru. The natural conditions at that time were raining at the latitude coordinates of -3.4426117 and longitude 114.8481638 with a location accuracy of 70 meters from the actual location of the presence.

3.2 Discussion

3.2.1 Implementation Cost Discussion

Presence operational costs for 2017-2019 are Rp. 27,665,070 and operational cost data for 2020 is Rp. 1,613,666. If the operational costs in 2020 are Rp. 1,613,666 Rupiah then there is a cost savings of Rp. 26,051,404.

From the economic feasibility before applying the application in table 2, there is a difference where the assumed cost that can be saved is Rp. 27,665,070, whereas after the application is implemented the operational costs that can be saved are Rp. 26,051,404. To be able to determine the feasibility of the application for the next few years, the savings after application will be included in the economic feasibility study.

3.2.2 Discussion of Validity and Reliability Test

After calculating the correlation validity test, the coefficient of correlation is obtained which will be used in measuring the level of validity of an item that is used to measure whether the item is suitable for use in this study or not. To determine whether or not the item used is feasible, a correlation coefficient significance test is carried out with a significance level of 5%, if it is correlated with the total value, the item can be declared true or valid.

In the reliability test, the researcher got a Cronbach's Alpha value of more than 0.6, this proves that the measuring instrument used is declared reliable or reliable. If it has been declared reliable, then the selected instrument can be used for measuring user satisfaction questionnaires. If it is not reliable, then the questionnaire used must be re-evaluated.

3.2.3 Discussion of the Satisfaction Questionnaire

Based on table 2 and figure 6, it can be seen that most of the users of the Presence ULM application were very satisfied at 79%, satisfied at 5%, dissatisfied at 10%, dissatisfied at 4% and very dissatisfied at 1%. Based on the results of these studies, consumer satisfaction with the ULM Presence application is very satisfied.

3.2.4 Smartphone GPS Accuracy Discussion

From the experiments that have been carried out, there are differences in accuracy that are influenced by natural conditions. Due to the rainy natural conditions, the GPS becomes less accurate because only a few satellites are captured. In addition to natural conditions, the use of Wi-Fi, cellular networks and GPS sensors from smartphones affects the speed of determining accurate coordinates.

4. CONCLUSION

The Legal and Personnel Section can monitor the location of employee attendance using a smartphone-based Online Presence. With the help of GPS on the employee's presence smartphone, it can be monitored whether the employee or lecturer is going home or not. Implementation / operational costs can be saved by using the Online Presence application. It can be seen that the implementation of the ULM Online Presence resulted in a savings of Rp. 26,051,404 for cutting operational

costs and maintenance costs. So in terms of Economic Feasibility, it can be seen that the application is economically feasible. From the results of the validity and reliability tests, the satisfaction questionnaire was proven to be valid and reliable with a Cronbach Alpha value of 0.996 or in other words the Very Reliable questionnaire. As much as 79% of the results of the distribution of the questionnaire showed that satisfaction with the ULM Presence application was very satisfied.

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