Measuring the Application Readiness Level of AKKU Online Mobile Attendance System using HOT-fit Method

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***Abstract*—The rapid advancement of Information Technology (IT) has affected various aspects of our daily lives—business, education, health care, and many others. Due to this, many organizations realized the importance of integrating IT systems in their operations. To keep up with the pace of this IT technological revolution, AKKU online mobile attendance system was implemented in the Tukdana district in Indramayu Regency, a regency in the West Java province of Indonesia. However, its implementation in the said locality faced several drawbacks. Through the use of the HOT (Human, Organization, Technology) fit framework, this study tested the Application Readiness Level (ARL) of AKKU Mobile. It determined whether the use of AKKU Mobile has positive effects on employee performance. The respondents of this research are 173 teachers from the Tukdana district. The instrument used was a questionnaire distributed after going through validity and reliability tests. The results showed that the ARL values on the human, organization, and technology dimensions were 73.19%, 78.37%, and 70.58%, respectively. The average ARL score of these three is 74% which is on the "pretty good" evaluation scale. This means that the implementation of the online attendance system was successful. However, it is still necessary to make modifications and improvements to the AKKU system based on the results of the ARL test.**

***Index Terms*—HOT-fit, attendance application, mobile application**

I. Introduction

The rapid advancement of Information Technology (IT) has affected various aspects of our daily lives—business, education, health care, and many others. Due to this, many organizations realized the importance of integrating IT systems in their operations for benefits like easy access and manipulation of data and information [1]. In education, various IT facilities such as Information Systems are now being used to improve information gathering methods. In an organization, information is like the blood flowing in an individual's body, whereby when parts do not get the information, a part of the system is weakened and ultimately stops functioning. This is why the need for accurate and efficient information is crucial to the existence of an organization. The use of Information Systems ensures that monitoring and evaluation activities of the organization can run smoothly in real-time [2]. Generally, the application of Information Systems in different processes of an organization allows a straightforward and speedy accomplishment of these transactions.

To keep up with the pace of this IT technological revolution, the Indramayu Regency, a regency in the West Java province of Indonesia, seeks to become a Smart City. A Smart City is an industrially contemporary city that runs all forms of internet-based Information and Communication Technology (ICT) related activities that optimize the efficiency of city operations and services [3]. In 2020, the Ministry of Communication and Informatics of Indonesia conducted an online briefing about Smart Cities, whereby Information Systems that support the development of Smart Cities were introduced. One of these was AKKU; an online mobile attendance application developed using Android technology. AKKU is an attendance system intended for teachers to utilize.

In the district of Tukdana in Indramayu Regency, AKKU online mobile attendance system was implemented in elementary and secondary schools. Since AKKU online mobile attendance is a relatively new technology, its implementation in the said locality faced several drawbacks. This is the reason why it is necessary to measure AKKU's level of readiness. Hence, this study aims to measure the readiness level of the AKKU online mobile attendance system using the HOT (Human, Organization, Technology) Fit method developed by Yusof, et al. [4]. This method or technique combines the Information System Success model of DeLone and McLean [5] and the IT-Organization Fit Model of Morton [6]. This evaluation is then expected to determine the effect and usefulness of AKKU on employee performance.

II. Methods

This descriptive study uses a quantitative research method to analyze quantitative data related to the state of the sample population. In this study, the HOT-fit method will be used as the evaluation method to measure the application readiness level (ARL) of AKKU, the independent variable, and whether it has positive effects on employee performance, the dependent variable. The scope of the ARL assessment of this research includes the application, information, infrastructure, human resource, and organization facets of the system. The research respondents in this study are the teachers in the Tukdana District in the regency of Indramayu. Since the respondents represent a vast population, only a part of this population will be taken as a sample. To determine the size of the sample, this research will follow Arikunto's [7] opinion that if the population is large or more than a hundred, 10% to 15% or 20% to 25% of this population will be taken as a sample. At an error rate of 5%, the 306 population of teachers became 173 after applying Slovin's formula. These 173 teachers were selected through purposive sampling based on the criterion for choosing respondents in line with the research

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objectives. The criterion for selecting respondents was that these teachers must be primary, middle, or high school teachers.

The distribution of the sample 173 population were 105 elementary teachers, 43 junior high school teachers, and 25 senior high school teachers. After going through the validity and reliability tests, the questionnaires were distributed to the respondents. The respondents' answers were then analyzed using the ARL model of the HOT-fit method. Every response of the respondents was scaled from Not Good, Good, to Pretty Good, depending on the ARL percentage result.

III. Results and Discussion

AKKU Mobile is an android-based online attendance system for recording real-time attendance data. It is a technology that was developed and implemented to bring into fruition a Smart Governance using ICT. Since manual attendance using pen and paper poses several drawbacks such as forging signatures, usage of a lot of resources like paper, and inefficiency of data processing, AKKU was created to automate the manual attendance of teachers and other government employees in the regency of Indramayu.

To use AKKU, the user must have a smartphone or an android phone installed with the AKKU mobile app. To make the app—AKKU—work, the user must be in a predetermined location saved in the AKKU database by the Education Administration Office. AKKU can identify this prearranged area by turning on the smartphone's GPS (Global Positioning System). The user then logs in to the system or confirms his attendance in the system via face scan. In this way, the system can record the user's real-time attendance and absences every working day. In addition, AKKU also notes down the log-out time of a user. This process enables the system to document the actual work hours of a user in a day.

There are various ways to evaluate an IS. There is the TAM (Technology Acceptance Model), TTF (Task Technology Fit), End User Computing Satisfaction, HOT-fit, and DeLone and McLean's IS Successful Model [5]. Among these methods, HOT-fit was selected as the assessment model to be used in this study as it is the commonly used evaluation technique for existing systems in an institution. Compared to other methods used for assessing Information Systems, HOT-fit is a complete solution that addresses the limitations of the different techniques [8]. It is an ideal model for research about evaluating IS as it produces comprehensive recommendations on improvements and developments that can be applied to an IS.

The HOT-fit method is an evaluation framework developed by Yusof, Paul, and Stergioulas [4] based on existing evaluation studies such as the Information System or IS Successful Model and the IT-Organization Fit Model [9]. According to Tjiptabudi & Ndaumanu [10], the HOT-fit framework is the ideal model for research on the assessment of IS as it provides comprehensive suggestions on how to improve an IS. To measure the ARL of an IS using the HOT-fit model, the human, technology, and organization aspects of an IS are gauged, and then from there, the overall net benefits are calculated.

Although, generally, AKKU online mobile app made it easy for teachers to log their attendance, empirical observations of the users have shown several problems related to the system's service quality. One of the problems met was that AKKU's server was often down or has errors which made logging into the system complex. The face scan feature was also inaccurate in that it is possible to use other people's pictures to register attendance. Users may be disadvantaged if they cannot use the app smoothly. For this reason, a systematic evaluation of AKKU was needed. It is pertinent to study whether using technology such as AKKU could positively impact its users. Furthermore, it is hoped that the results of this study could serve as a guide material for evaluating Information Systems, as a recommendation to the application developer to improve and perfect the existing system, or as a benchmark to increase the quality of the application's level of user-experience.

The following tables show the different results of the assessment done. Table 1 explains respondents' answers to the survey questions regarding the various variables related to the application, such as System Usage, User Satisfaction, Organizational Structure, Organizational Environment, System Quality, Information Quality, Service Quality, and Net Benefits.

TABLE I.
Respondent Response

Variable	Choice	Number of Choices
System Usage	Strongly Agree	106
	Agree	298
	Neutral	148
	Disagree	122
	Strongly Disagree	18
User Satisfaction	Strongly Agree	112
	Agree	224
	Neutral	158
	Disagree	23
	Strongly Disagree	2
Organizational structure	Strongly Agree	129
	Agree	434
	Neutral	106
	Disagree	18
	Strongly Disagree	5
Organizational Environment	Strongly Agree	40
	Agree	378
	Neutral	94
	Disagree	3
	Strongly Disagree	1
System Quality	Strongly Agree	131
	Agree	756
	Neutral	288
	Disagree	149
	Strongly Disagree	51
Information Quality	Strongly Agree	57
	Agree	823
	Neutral	341
	Disagree	142
	Strongly Disagree	21
Service Quality	Strongly Agree	10
	Agree	198
	Neutral	92
	Disagree	41
	Strongly Disagree	5
Net Benefits	Strongly Agree	122
	Agree	584
	Neutral	128

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Variable	Choice	Number of Choices
	Disagree	26
	Strongly Disagree	5

Table 2 shows the results of the calculation of the ARL result.

TABLE II.
ARL RESULT

Dimensions	Constructs	Indicators	ARL	Categories
Human	System Usage	Ease of use	80.80	Good
		Application skills	74.10	Pretty good
		Training	68.32	Pretty good
		Overall conformity with user expectations	57.45	Not good
	User Satisfaction	User satisfaction	88.32	Good
		Appearance	68.78	Pretty good
		Data suitability	71.56	Pretty good
Organization	Organizational Structure	App manager background	82.42	Good
		Communication	79.19	Pretty good
		Support from all parties	77.80	Pretty good
		System support facilities	77.34	Pretty good
	Organizational Environment	Support and assistance from all work units	78.49	Pretty good
		Support from the Indonesian Ministry of Education and Culture	76.35	Pretty good
		Improve communication between all parts of the organization	77.80	Pretty good
Technology	System Quality	Ease of use	79.30	Pretty good
		Application usage guide	74.33	Pretty good
		App response speed	68.43	Pretty good
		Mobile-based for easy access	78.84	Pretty good
		Appearance	72.83	Pretty good
		Ease of access	68.55	Pretty good
		Applications rarely experience errors	43.00	Not good
		Data Confidentiality	84.39	Well
	Information Quality	Quick response	70.63	Pretty good
		Suitability of features with needs	75.14	Pretty good
		Easy to understand information	74.10	Pretty good
		Information is reliable and precise with the data entered	75.37	Pretty good
		Complete and detailed	76.41	Pretty good
		Language consistency	46.58	Not good
		Valid data is easy to understand	73.17	Pretty good
		Easy access to information	75,6	Pretty good
	Service Quality	Response to problems	73.41	Pretty good
Net Benefits		Excellent, focused and accurate service from application developers	65.89	Pretty good
		Help achieve effective goals	79.07	Pretty good
		Efficient	78.38	Pretty good
		Able to solve problems	75.26	Pretty good
		Save and efficient	81.04	Good

Based on the results of the ARL calculation using the HOT-fit framework, the human, organization, and technology dimensions of AKKU Mobile have scored an average of 74% (a pretty good category). Due to the convenience AKKU Mobile has brought to the respondents' attendance process, the ARL points of the organizational dimension of the system have scored high. This indicates that AKKU is implemented effectively based on the respondents' perceptions. However, this result does not show that the application was executed perfectly, which means there are still gaps that must be mended to enhance the performance of AKKU Mobile further. Similarly, in the context of organizational structure and the organizational environment under the administrative dimension of the ARL assessment, AKKU Mobile also scored

high, as shown by the respondents' positive perception of the statements under these paradigms.

On the other hand, the human dimension of AKKU Mobile on the construct of system use, AKKU Mobile scored an ARL value of 80.80%. This is given the application's user-friendliness, making it easy to understand and operate. On the concept of user satisfaction in consideration of appearance, user satisfaction, and data suitability, AKKU mobile also achieved excellent marks in the ARL. However, on the aspect of AKKU Mobile's overall conformity to user expectations, the ARL value was low at 57.45% due to the error breaches in the application.

Because of the technology dimension in the construct of system quality, data confidentiality earns the highest ARL points at 84.39%. This means that the respondents are confident in the security control of AKKU Mobile. However, the overall ARL score of the system quality construct is low. This is because of the incapability of AKKU Mobile to indicate experienced errors. In comparison, under the information quality construct, the language consistency of AKKU Mobile also got the lowest ARL value at 46.58% or not good. This is because AKKU Mobile failed to be constant in its language usage. Despite this, on the criterion of "easy to understand information", AKKU received an ARL valuation of exceptionally good at 74.10% marks. This means that even with the inconsistency of language, the information dissemination within the app remains easily understood. Additionally, on the criterion of complete and detailed information quality, AKKU Mobile obtained a "pretty good" evaluation at an ARL value of 76.41%. This means that AKKU was successful in providing comprehensive data about itself.

Under the service quality construct, the two measured indicators—response to problems; and excellent, focused, and accurate service from application developers—scored a "pretty good" appraisal at 73.41% and 65.89%, respectively.

Finally, on the net benefits dimension, AKKU Mobile got a high ARL value in all the net benefits indicators. This indicates that most respondents believed that AKKU Mobile facilitates attendance activities, helps achieve practical goals in the attendance process, and increases work efficiency. Considering the overall ARL evaluation using the HOT-fit method, this study reveals that the utilization of AKKU online mobile attendance, the process of recording employee turnout has become more efficient and economical. This study also confirms that the respondents are satisfied with the service of AKKU even with the problems they experienced since the response rate of the developers is excellent.

IV. Conclusion

Generally, this study establishes that the ARL measurement of all the dimensions—human, technology, and organization—and constructs of the HOT-fit framework on the AKKU online mobile application is reasonably good, with an average rating of 74%. This proves that AKKU Mobile is successful in its implementation. However, it is necessary to make modifications and improvements to the AKKU system based on the results of the ARL test. Considering the errors frequently met with the usage of AKKU Mobile and the development of the ARL assessment, this research recommends the following:

- Improve the connectivity of the app to its server;
- Fix the problematic log-in process;
- Fix the inaccurate face scan feature of the system;
- Use consistent language throughout the app; and
- Focus on improving the system's dimension and constructs that scored low in the ARL measurement.

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