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Quality Factors of Intention To Use in Artificial Intelligence-Based AIKU Applications

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Abstract

Air Quality Artificial Intelligence (AIKU) is an Android-based application that allows individuals to check air conditions using their smartphones. This study aims to evaluate the application of Artificial Intelligence Air Quality (AIKU) based on user perceptions and evaluate how this affects the user's intention to utilize the Halal MUI application. Quantitative research methods were applied in this investigation. The data collection instrument was a questionnaire which was divided into four parts: introduction, explanation of the AIKU application, personal information of the respondent, and the core, which contains questions about the quality of the MUI Halal application. Multiple linear regression analysis examines the relationship between quality characteristics and usage decisions. Based on the research findings, the average quality score is 3.08 on a scale of 4.00, indicating that users perceive the AIKU application as a high-quality application. The results of the model reliability test with the F test show that the estimated linear regression model can be used to describe the effect of smartphone application quality on usage decisions. The t-test findings for the three quality variables show that the three Webqual 4.0 variables significantly influence the user's intention to use AIKU applications in the future. The characteristics of usability, information quality, and service interaction can explain 43.7% of the intention to use AIKU applications.

Keywords: *AIKU, Application, Air Quality*

1. Introduction

Because of the rapid advancement of information and communication technology, numerous websites and web-based programs can now be downloaded and used on smartphones. The number of Android-based smartphone applications registered on the Google Play Store had reached 3.6 million as of January 2023. Android-based applications work as a type of website, with the website serving as a portal via which users can communicate with application service provider firms. With so many websites and users' increasingly sophisticated needs for the website services offered, one of the essential things to consider is the website's quality so that consumers can genuinely feel it[1].

The Artificial Intelligence Air Quality (AIKU) application is available on the Google Play Store. The AIKU program is an Android-based tool that can detect air quality anywhere using a smartphone. This application was created in response to people's concerns about the air quality in areas surrounding factories. People frequently contract air-borne infections because the air that appears clean is not guaranteed to be pure. Consumers can use AIKU to evaluate the air quality around them to avoid sickness.

There are various ways to evaluate application quality, including EtailQ, Webqual 4.0, Sitequal, and NetQual. Barnes and Vidgen (2003) established the Webqual 4.0 approach used in this study. Because the measuring scale in Webqual 4.0 has been proven to measure the quality of website services, making Webqual 4.0 one of the most generally acknowledged and implemented methodologies by several studies. Webqual 4.0 is an update to the previous Webqual version. Webqual 4.0 is used to assess the quality of business websites. However, during its development, Webqual 4.0 was also used to assess the quality of service on various websites[2].

Webqual 4.0, on the other hand, has never been used to assess the quality of Android-based smartphone applications. As a result, research on the implementation of Webqual 4.0 on Android-based smartphone applications is required to determine whether Webqual 4.0 is valid for assessing the quality of information and communication technology services other than webpages[3]. According to Loiacono's (2002) research, website quality benefits the user's decision to revisit the website. As a result, in addition to evaluating the application's quality, this study seeks to determine whether there is a relationship between the AIKU application's quality and the user's desire to repeat the application.

2. Research Method

Webqual 4.0 and multiple linear regression are the basic models used as a reference for performing research[8]. Webqual 4.0 is used to assess the quality of AIKU apps using user feedback. Webqual 4.0 is made up of three variables: usability, information quality, and service interaction, each of which is detailed in 22 question items[9]. The usability variable assesses users' impressions of the website's ease of use, including ease of learning, discovery of content, navigation, and operation[10]. The information quality variable assesses the website's information's accuracy, updating, completeness, and appropriateness. Meanwhile, the service interaction variable assesses the presentation quality of the website[11]. Multiple linear regression analysis was utilized to examine the impact of each Webqual 4.0 variable on the decision to use the AIKU application. Figure 1 depicts the research model used. The following is the study's hypothesis:

H1: usability positive effect on intention to use[12].

H2: information quality positive effect on intention to use[13].

H3: service interaction positive effect on intention to use[14].

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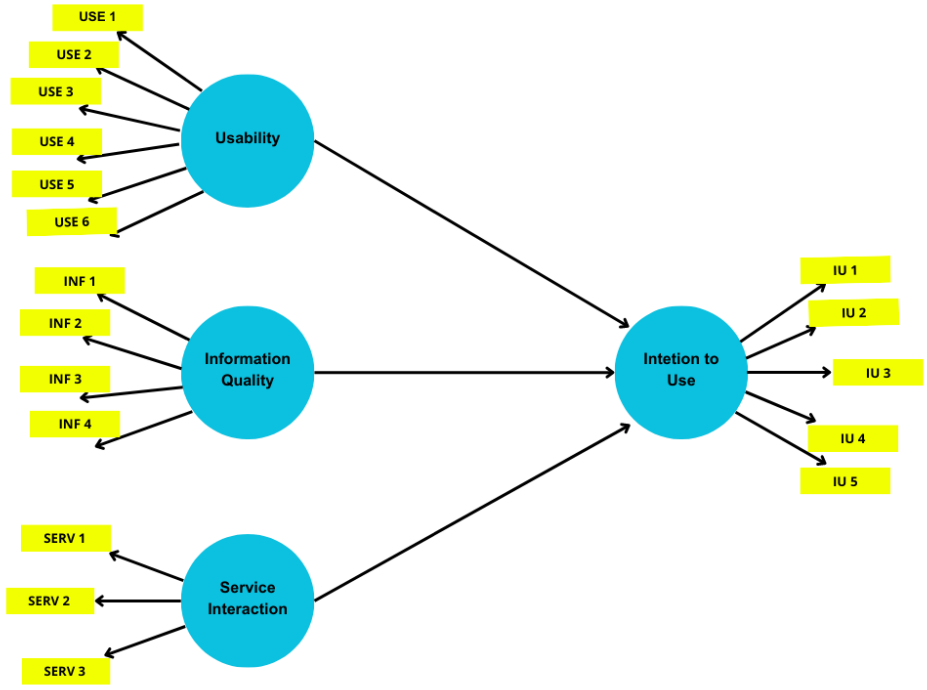

Figure 1. Research model

The quantitative research method was applied in this investigation. A questionnaire is the data collection instrument. The questionnaire is divided into four sections: the introduction, an explanation of the AIKU application, the respondent's personal information, and the core, which contains questions about the MUI Halal application's quality. Question items in the core part are graded on a Likert scale of 1 to 4, with "1" indicating "strongly disagree" and "4" indicating "strongly agree."[15].

The AIKU application quality measurement instrument is based on Webqual 4.0 question items. Because the study's object is an Android-based application, and Webqual 4.0 is designed to test website quality, the 22 question items in Webqual 4.0 must be adjusted. Modifications are required to ensure the question items are appropriate for the research environment, in addition to referring to the Webqual 4.0 question items[16].

Webqual 4.0 only addresses the three variable website quality question items. Webqual 4.0 does not address the question of the dependent variable (intention to utilize the program). The question items for the dependent variable (intention to utilize) in this study were changed from the research[17]. After compiling the questionnaire question items, data collection began, separated into two stages: initial and significant data collection. Preliminary data was collected to test validity and reliability and improve the phrase form of the question items. In this initial data collection, respondents offered comments on the contents of the questionnaire and performed a simulation of filling out the questionnaire to ensure that the respondents fully understood each question item. After that, a modification was performed, and the amended questionnaire was delivered to the respondents to acquire the primary data to answer the study questions[18].

Purposive sampling is the data collection strategy employed. Respondents were drawn from a sample of persons in Tangerang who own and are familiar with smartphones. Questionnaires were distributed in a variety of locations, including campuses, housing

developments, and industrial zones. Following the collection of data, data processing is performed to answer the study objectives that have been established[19].

2.2 Literature Review

A. Mikalef et al. (2020) conducted a systematic literature study on the factors contributing to users' acceptance of artificial intelligence. They reviewed 36 empirical studies using the Technology Acceptance Model (TAM) or Unified Theory of Acceptance and Use of Technology (UTAUT) models to examine the influence of variables such as perceived usefulness, perceived ease of use, perceived intelligence, perceived trustworthiness, perceived enjoyment, social influence, facilitating conditions, and behavioral intention towards acceptance of artificial intelligence by users in various application contexts. They found that perceived usefulness and ease of use were the main factors influencing users' acceptance of artificial intelligence in all application contexts. They also found that perceived intelligence and trustworthiness are essential factors influencing user acceptance of artificial intelligence in application contexts involving human-machine interaction or automated decision-making. They recommend several steps to improve the quality of research on user acceptance of artificial intelligence, such as developing comprehensive theoretical models, using appropriate quantitative and qualitative methods, and providing accessible source code and data. They also discovered that perceived intelligence and perceived trustworthiness are critical elements impacting user acceptance of AI in scenarios requiring human-machine contact or automated decision-making. They advocate numerous actions to increase the quality of research on artificial intelligence user acceptability, such as establishing complete theoretical models, employing appropriate quantitative and qualitative approaches, and making source code and data available[4].
B. Kumar, P., and Singh, A. (2020) created an air quality monitoring system that employs an optimal algorithm to measure air pollutants such as SO, NO 2, CO, O 3, PM 2.5, and PM 10 in real-time. The deep learning, long short-term memory (LSTM) algorithm will give accurate air quality measurements and be an effective air pollution controller in intelligent cities. The author needs to explain how the air quality monitoring system might interact with consumers or authorities concerned with air pollution. The authors also needed to assess the air quality monitoring system's social, economic, and environmental consequences[5].
C. Yadi Karyadi (2022) Mengembangkan penerapan model LSTM dan LSTM Bidirectional telah menunjukan hasil yang lebih bagus dibandingkan model Gated Recurrent Unit (GRU) untuk permasalahan data yang bersifat time series kualitas udara. Hal ini mengacu pada hasil performance model LSTM dan LSTM Bidirectional (LSTM-Bi). Pada kedua model ini perbandingan RMSE of test prediction lebih kecil dibandingkan standard deviation of test dataset untuk variabel suhu, kelembaban, dan ISPU dengan score: suhu (LSTM 3.18 < 4.40, LSTM-Bi 3.23 < 4.40), kelembaban (LSTM 6.96 < 19.32, LSTM-Bi 7.07 < 19.32), ISPU (LSTM 1.84 < 1.90, LSTM-Bi 1.86 < 1.90)[6].

According to the studies presented above, air quality forecasting and monitoring systems based on artificial intelligence and Internet of Things technology can provide users with benefits such as increasing the accuracy of air pollution detection, providing useful and timely information, and reducing the cost and complexity of air monitoring. quality, while also improving users' health and well-being. Several factors influence user acceptance of the accuracy of AI air quality sensors, including system performance, system usability, system reliability, system suitability to user needs, social and organizational support, and external factors such as environmental conditions, government regulations, and so on[7].

3. Findings

3.1 Research Variables and Indicators

Table 1 shows the indicators or question items used in this investigation[20].

Tabel 1. Research Variables and Indicators

Variable	Iindicator
Usability (USE)	1. AIKU is generally advantageous to customers. 2. AIKU assists in checking the air quality around you. 3. AIKU alleviates concerns about hazy air conditions. 4. AIKU is simple to use. 5. AIKU is simple to learn. 6. Using AIKU does not necessitate any particular abilities.
Information Quality (INF)	1. AIKU offers accurate information on the state of air quality. 2. AIKU gives up-to-date information on an area's air quality. 3. AIKU information is current. 4. AIKU gives detailed air status information.
Service Interaction (SERV)	1. AIKU's appearance is appealing. 2. AIKU makes it simple to monitor air quality. 3. It takes little time to check the air quality status with AIKU.
Intention to Use (IU)	1. I will utilize AIKU in an area with unknown air quality. 2. I will use AIKU to obtain information on the air quality around me. 3. I will continue to utilize AIKU in the long run. 4. I will utilize AIKU when I need clarification on the air quality in my immediate surroundings. 5. Even if the air quality appears OK, I will continue monitoring it with AIKU.

3.2 Validity Test

The Product Moment Pearson Correlation validity test was employed in this investigation. The initial data collection consisted of 30 samples. The rtable value = 0.362 is known for the amount of data (N) = 30 with a significance level of 5%. This rtable value is then compared to the rcount acquired from the SPSS 17.0 output. Table 2 demonstrates that all rcount values are more significant than rtable, implying that all questionnaire items are genuine[21].

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Tabel 2. Result

Code	r-Count	r-Table	Description
IU1	0,748	0,362	Recognized
IU2	0,649	0,362	Recognized
IU3	0,748	0,362	Recognized
IU4	0,630	0,362	Recognized
IU5	0,712	0,362	Recognized
SERV1	0,652	0,362	Recognized
SERV2	0,564	0,362	Recognized
SERV3	0,532	0,362	Recognized
INF1	0,747	0,362	Recognized
INF2	0,634	0,362	Recognized
INF3	0,601	0,362	Recognized
INF4	0,548	0,362	Recognized

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USE1	0,489	0,362	Recognized
USE2	0,629	0,362	Recognized
USE3	0,679	0,362	Recognized
USE4	0,399	0,362	Recognized
USE5	0,425	0,362	Recognized
USE6	0,466	0,362	Recognized

3.3 Reliability Test

The Cronbach Alpha value is used to determine the level of variable reliability[22]. The reliability measurement findings, as shown in Table 3, reveal that the Cronbach Alpha value for all variables exceeded the value of 0.6, implying that the constructs ordered in all variables are reliable[23].

Tabel 3. Reliability Test Results

Variabel	Alpha Cronbach
IU	0,753
SERV	0,721
INF	0,687
USE	0,710

3.4 Profile of Respondents

The primary data-gathering stage resulted in the collection of 200 questionnaires. One hundred seventy-nine surveys can be used for additional data processing after being filtered using missing value analysis and outlier analysis. Table 4 displays respondent profiles[24].

3.5 AIKU Quality

According to the respondent profile in Table 4, most respondents (84.36%) were unaware of the AIKU application. To assess the quality of AIKU, the respondent is explained the AIKU application and the option to try to verify the air quality status using the AIKU

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application before giving an assessment. After the respondent understands the function and has used the AIKU application, they are invited to complete a questionnaire. Table 5 displays the findings of the AIKU application quality assessment based on user impressions[25].

Tabel 4. Profil Responden

Indicator		Total	Percentage
Gender	Male	95	53.08%
	Female	84	46.94%
Age	<21 years	69	38.77%
	21-30 years	61	34.28%
	31-40 years	44	24.17%
	41-50 years	5	2.82%
Education	SD	2	1.13%
	SMP	13	7.27%
	SMU/SMK	96	53.64%
	D3	18	10.07%
	D4/S1	42	33.47%
	S2	6	3.36%
	S3	2	1.13%
AIKU Application Knowledge	Yes	28	15.65%
	No	151	84.37%
Use of the AIKU	Yes	10	5.60%

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Application	No	169	94.42%

Tabel 5. AIKU Quality

Code	Average Score	Standard Deviation	Average Variable Score
INF1	3.21	0.46	3.09
INF2	3.05	0.46	
INF3	3.04	0.51	
INF4	3.04	0.45	
SERV1	3.03	0.57	3.05
SERV2	3.08	0.47	
SERV3	3.03	0.55	
USE1	3.33	0.58	3.17
USE2	3.15	0.50	
USE3	3.13	0.57	
USE4	3.17	0.54	
USE5	3.11	0.49	
USE6	3.12	0.52	

The average score of AIKU application quality is obtained from Table 5, which is the average score of the three variables, namely 3.09. According to user perceptions, the AIKU application is high quality regarding usability, information quality, and service interaction [26].

3.6 Multiple Linear Regression

An assumption test, including tests for normality, multicollinearity, autocorrelation, and heteroscedasticity, was performed before constructing a multiple linear regression model. An

excellent linear regression model has typically distributed data and is free of multicollinearity, autocorrelation, and heteroscedasticity [27]. Table 6 displays the results of the multiple linear regression assumption test. The assumption test findings show that all of the assumptions of the multiple linear regression model can be satisfied, allowing the multiple linear regression model to be utilized to test the research hypothesis. Tables 7, 8, and 9 show the findings of multiple linear regression analyses [28].

The multiple linear regression model has a coefficient of determination (R2) of 0.437, or 43.7%, as shown in Table 7. The coefficient of determination is the fraction of the influence of the independent variable on the dependent variable. This suggests that usability (USE), information quality (INF), and service interaction (SERV) can explain 43.7% of the desire to use Halal MUI applications. While other variables not included in the regression model account for the remaining 56.3% [29].

Table 8 reveals that the F value for ANOVA with the F test is 45.301 with a significance value of 0.000. This significance value is less than the value = 0.05. Hence the estimated regression model can be used to explain the effect of the independent variables on the dependent variable [30].

Table 9's regression coefficients demonstrate how the AIKU application quality variable influences the user's propensity to reuse the application. Table 9 reveals that the significance value for the three application quality factors (usability, information quality, and service interaction) is less than = 0.05. This suggests that the elements of usability, information quality, and service interaction all substantially impact the intention to use the AIKU application.

The service interaction variable has the highest t-value of 4.031 compared to the other two. This suggests that the service interaction variable most influences explaining AIKU application usage intention. Similarly, the t value for usability (t=3.162) is more significant than the t value for information quality (t=2.551). This suggests that while the information quality variable is essential in an Android-based application, its effect on the intention to use the AIKU application is smaller than that of the usability variable. A multiple linear regression model equation can also be generated using Table 9: Y = 1.039 + 0.270 X1 + 0.317 X2 + 0.560 X3 where Y = IU, X1 = USE, X2 = INF, and X3 = SERV. These findings show that all of the hypotheses tested in this study, namely usability, information quality, and service interaction characteristics, all positively affect the intention to use.

Table 6. Multiple Linear Regression Assumption Test

Type of Testing	Method	Test Results	Criteria	Description
Normality	One-Sample Kolmogorov	Significance 0.082	If the significance value is > 0.05 then the data is normally distributed	Data is normally distributed
Multicollinearity	Smirnov Tolerance dan VIF	tolerances: USES: 0.533 INF: 0.568 SERVs: 0.494 VIFs:	If the Tolerance value > 0.10 then there is no multicollinearity	There is no multicollinearity

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		USES: 1,878 INFs: 1,761 SERVs: 2,023	If the VIF value < 10 then there is no multicollinearity	
Autocorrelation	Durbin-Watson	DW: 1,861	If 1.7896 < DW < 2.2104 then there is no autocorrelation	There is no autocorrelation
Heteroscedasticity	Rank Spearman	Significance: USE: 0,468 INF: 0,789 SERV: 0,476	If the significance value is > 0.05, there are no symptoms of heteroscedasticity	There is no heteroscedasticity

Table 7. Summary of Regression Models

R	R2	Adj R2	Std. Error
0,662	0,438	0,428	1,66323

Tabel 8. Summary of ANOVA

Model	Regression	Residual	Total
Sum of Squares	375,945	484,100	860,045
df	3	175	178
Mean	125,31	2,766	
Square F	45,301		
Sig.	0,000		

Table 9. Regression Coefficient

Model	Constant	USE	INF	SERV
β	1,039	0,270	0,317	0,560
Std.	1,319	0,085	0,124	0,139
Error Beta		0,246	0,192	0,325
t	0,788	3,162	2,551	4,031
Sig.	0,432	0,002	0,012	0,000

Discussion

Webqual 4.0, employed in this study, is a framework for measuring website quality. Webqual 4.0 was employed in this study and then converted to a framework for measuring the quality factor of Android-based applications. The study's findings indicate that Webqual 4.0 is still valid and trustworthy enough to assess the quality of information and communication technology services other than websites. This is because websites and Android-based mobile applications share many characteristics, such as serving as a connecting window between people and enterprises. However, based on Tables 2 and 3, it is clear that the Webqual 4.0-based measuring instrument's validity and reliability scores are somewhat over the acceptance standards.

Because the application quality factor drives the outcomes of multiple linear regression, the user expects to use the AIKU application. However, despite user impressions that the AIKU application is of high quality, this AIKU application is not commonly known or used by users. According to the respondent profile in Table 4, only 28 people (15.64%) were aware of the AIKU application out of 179 respondents. Only 10 of the 28 participants said they had utilized and felt the benefits of the AIKU application. And after being given a brief introduction to AIKU and being encouraged to explore the app's features, the respondent concluded that AIKU not only has the capability of determining the status of a product, but it also has the capability of reducing the risk of a halal logo being used in the production process.

The AIKU application shows community awareness by delivering air quality monitoring technologies. This application's design undoubtedly necessitates a significant expenditure. As a result, it must be promoted so that the AIKU application may be used optimally and not become obsolete. This is consistent with the multiple linear regression analysis findings, which show that the AIKU application quality variable can only explain 43.7% of the application usage intention variable. This suggests that another 56.3% of factors should have been considered in this research model. One of these additional elements is socializing about the AIKU application's existence and usefulness. The AIKU application shows community awareness by delivering air quality monitoring technologies. This application's design undoubtedly necessitates a significant expenditure. As a result, it must be promoted so that the AIKU application may be used optimally and remain relevant. This is consistent with the multiple linear regression analysis findings, which show that the AIKU application quality variable can only explain 43.7% of the application usage intention variable. This suggests that another 56.3% of factors should have been considered in this research model. One of these additional elements is socializing about the AIKU application's existence and usefulness.

4. Conclusion

The results of measuring the quality of the AIKU application show that users give a score of 3.08 out of a maximum of 4.00, indicating that the AIKU application has good quality. AIKU application quality measurement uses the Webqual 4.0 method which tests the quality of websites. Even though Webqual 4.0 is still valid and reliable enough to measure the quality of Android-based mobile applications, it would be more appropriate if the quality dimensions in Webqual 4.0 were adjusted to the object of study being studied. Future research can determine quality dimensions, including quality indicators, which are suitable for Android-based application study objects in order to increase the validity and reliability of research instruments.

Perceived quality, which includes three variables: usability, information quality, and service interaction, has been shown to have a positive and significant effect on the variable of user intention to reuse AIKU applications. However, these three quality variables can only explain 43.7% of the variable intention to utilize the program. The remaining 56.3% can be

explained by other variables not included in the multiple linear regression model. Therefore, additional research can be conducted to cover the new independent factors that can be included in the regression model in order to increase the proportion of the effect of the independent variables on the dependent variable. The socialization variable is one of the independent variables that can be included in the regression model.

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