

Comparative Quality Analysis of Mutual Fund Investment Service on Ajaib and Bibit Application based on User Satisfaction Using PIECES Method

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Abstract— Example of technological developments can be seen in the procedures for doing business and investing where many people are starting to leave the traditional ways of transacting, and switch to more practical and easy ways. One way is to invest online. Seeing the potential of the Indonesian market for the desire to invest, there are currently many mobile-based investment applications such as Ajaib and Bibit. This research analyzes the comparison of the performance of mutual fund investment services on Ajaib and Bibit application based on user satisfaction using the PIECES method as an assessment indicator. This research tool uses a questionnaire that has been tested for validity and reliability for 54 users of mutual fund services on Ajaib and Bibit application with a rating using a Likert scale. Based on the research results, mutual fund investment services using the Ajaib application for the Information category are more satisfying to users than the Bibit application. On the other hand, for the Performance, Economy, Control, Efficiency, and Service categories, Bibit application satisfies users more than the Ajaib application.

Keywords— Quality Analysis, Ajaib, Bibit, PIECES.

I. INTRODUCTION

Mutual fund applications are increasingly appearing and are being sought by novice investors because mutual funds are still an attractive investment choice for novice investors and are also one of the investment instruments favored by the millennial generation because they are able to answer their needs and desires. Investor growth has also occurred in mutual fund investors, the number of which has reached 6.11 million investors as of October 2021. This number is up from September 2021 which was 5.78 million investors or grew by 5.71%, which was contributed mostly by millennials. A total of 92% of novice investors are aged 21-40 years [1].

Ajaib and Bibit have several mutual fund services. Both applications have also been registered with the Financial Services Authority so they are safe to use. Ajaib application, which was founded by the company PT Takjub Teknologi Indonesia and Bibit, which was founded by the company PT Bibit Tumbuh Bersama, was released in the same month and year, on January 2019. Although, they have something in common, such as the mutual fund investment application that has been registered with the OJK and released in the same month and year but there are some parameters that make the Ajaib or Bibit application more preferred by users. According to DailySocial research in 2020, 35.1% of those who use Bibit applications that are the highest among other investment applications. Meanwhile, the Ajaib Application, which was released together with Bibit, only occupied the sixth position, which was 12.6% [2].

System performance analysis can be done with several analytical models, one of which is the PIECES framework. The PIECES method has six assessment variables in evaluating, namely the first is performance, information, economics, control, efficiency and service [3]. With this framework, it is expected to produce new things that can later be considered in developing and improving the system [4]. When compared to other methods, the PIECES method has more advantages, for example the Technology Acceptance Model (TAM) method. Individual acceptance of a technological system can be determined by two points, namely the perceived usefulness and the perceived ease of use. The TAM method only uses two main assessments while the PIECES method uses six important points. The PIECES method is an analytical method as a basis for obtaining more specific issues [5]. The PIECES method can be used to analyze the level of user satisfaction with the information system used [6].

Seeing the gap in the users growth of Ajaib and Bibit mutual fund applications even though they were released in the same month and year, this study analyzes the quality comparison of mutual fund service on the Ajaib and Bibit applications based on user satisfaction in terms of performance, information, economy, control, efficiency, and services using the PIECES method. By using PIECES as a system analysis tool, it is expected to find out which components need to be improved, so that the strengths and weaknesses of the system can be identified based on user satisfaction to be used as a reference for future application progress.

II. LITERATURE REVIEW

Research on Emarketplace Website Performance Analysis [7] by distributing questionnaires to evaluate and measure E-marketplace websites using the PIECES method concluded that based on responses from 20 Bireuen Emarketplace users, the average score for all dimensions ranged from 42.8% to 51.45% and in line with expectations. Other research using the PIECES method by [4] regarding work plans and budgets with the IPA calculation method shows that the results of the level of conformity are Performance 92.81%, Information and Data 94.71%, Economy 95.59%, Control and Security 89.90%, Efficiency 97.07%, Service 92.20%. The average user satisfaction and the importance of information system quality is 93.71%. Based on research [8] about service quality as a parameter of user satisfaction using the PIECES method, the results of the calculation of the average number of satisfaction levels obtained a value of 4.925 in the data and information

domain, and when combined with the level of satisfaction according to Kaplan and Norton, it can be concluded that the level of user satisfaction with the Inventory Forecasting System is in the VERY SATISFIED category. Other research on user satisfaction by [9] with the PIECES method gives a fairly good level of satisfaction with the performance domain getting a score of 3.9, the information and data domain getting a score of 3.86, the economics domain getting a score of 3.80, domain control and security got a score of 3.85, domain efficiency got a score of 4.14, and domain service got a score of 3.89. Research on system performance analysis using the PIECES method by [5] resulted in the PT PLN (Persero) website grade being grade C, which means the web has a long enough time to access. Research by [10] on application prototypes with the Prototyping method obtained the results that the report button application is very good and can assist customers in providing information on Transjakarta bus services. System performance analysis research by [11] about the Balanced Scorecard in this study is the User Orientation Perspective, and the Future Perspective which is considered to need improvement. Another system performance analysis study using the IT Balanced Scorecard by [12] produced a total measurement result of 92.94%. From the total number, it can answer the desire and ease of processing data and overall has been able to help the quality of employee performance at work. Another system performance analysis study [13] using the TRADE method resulted in the highest actual performance being 94.13% on the very good Quality variable and the lowest on the Productivity variable with the actual performance being 91.15%. Research by [14] regarding the effect of application quality on employee performance using the Path Analysis method resulted in the Application Quality Variable having an r value of 0.919, employee performance having an r value of 0.920, and the customer service variable having an r value of 0.782. The three variables in this study were declared reliable because $r_{count} > r_{critical}$, $r_{count} > 0.600$.

III. RESEARCH METHOD

This research begins by analyzing the object of research. Furthermore, data collection in the form of primary and secondary data is carried out. After collecting data, the data model design can be created. After the design of the data model, the research instruments can be determined to analyze the data by calculating the average of each aspect based on the PIECES parameters to obtain a quality comparison of mutual fund investment services on Ajaib and Bibit application based on the PIECES Framework.

A. Object Analysis

The scope of the object of this research based on the problems is the comparative quality analysis of mutual fund investment services on the Ajaib and Bibit application based on user satisfaction. This research results based on user satisfaction, especially the millennial generation that use Ajaib and Bibit application for mutual fund investment service so that it is found which components must be improved based on the PIECES component.

B. Data Collection

The data collection on this research is the millennial generation who are users of the mutual funds feature on the Ajaib and Bibit application in the telegram group "Mutual Fund Mentor 24". The total population in the group that uses Ajaib and Bibit application for mutual fund investment service is 62 person. The research sampling technique used Random Sampling with the solvin formula:

$$n = \frac{N}{N \cdot d^2 + 1} \tag{3.1}$$

Which n stands for sample size/number of respondents. N stands for population size and d stands for sampling error 5%.

C. Design Model Data

In determining the research indicators as questionnaire material, this research using the adoption results from the journal "Penerapan PIECES Framework sebagai Evaluasi Tingkat Kepuasan Mahasiswa terhadap Penggunaan Sistem Informasi Akademik Terpadu (SIKADU) pada Universitas Negeri Surabaya" by Nanda Kinanti Amelia Putri and Aries Dwi Indriyanti. Research indicators based on the PIECES method can be seen in table 3.1 :

TABLE 3.1 Research Indicators

Variable	Indicators
Performance	Throughput
	Respon Time
	Audiability
	Communication Habits
	Completeness
	Consistency
	Fault Tolerance
Information	Accuracy
	Information Relevance
	Information Presentation
	Data Flexibility
Economy	Reusability
	Resource
Control	Integrity
	Security
Efficiency	Usability
	Maintanability
Service	Accuracy
	Reliability
	Simplicity

D. Research Instrument

The research instrument used a questionnaire based on the variables in the PIECES method. Validity and reliability tests were carried out to ensure the accuracy to measure the variables of the object. High validity and reliability are needed as the basis for drawing conclusion.

a. Validity Test

The technique used to test the validity of the questionnaire is the person correlation technique, by correlating the score of each question item with the total score. The validity test was carried out on 54 respondents who were users of the Ajaib and Bibit mutual fund application service. This validity test was carried out using the SPSS 25 program with the following criteria (Sugiyono, 2017) :

1. If $r_{count} > r_{table}$ then the statement is declared valid

2. If $r_{count} < r_{table}$ then the statement is declared invalid
 b. *Reliability Test*

According to Sugiyono (2017: 130) states that the reliability test is the extent to which the measurement results using the same object will produce the same data. This reliability test was carried out on 54 respondents using Ajaib and Bibit application of mutual fund service. Using the SPSS 25 program, the variables are declared reliable with the following criteria:

1. If Cronbach's Alpha value > 0.6 then reliable
2. If the value of Cronbach's Alpha < 0.6 then it is not reliable

E. *Data Analysis*

In analyzing the data obtained from the questionnaire with 54 respondents, the Likert scale was used. In this research, respondents were asked to complete a questionnaire which required them to indicate their level of agreement with a series of statements provided in the questionnaire. The interval scale for a series of statements on the questionnaire can be seen in table 3.2 :

TABLE 3.2 Interval Scale

Answer	Score
Very Dissatisfied	1.00 – 1.79
Not satisfied	1.8 – 2.59
Quite Satisfied	2.6 – 3.39
Satisfied	3.4 – 4.91
Very satisfied	4.92 – 5

To get the average level of satisfaction from each category using the formula (Prayogi et al., 2019) :

$$AS = \frac{TQS}{NQ}$$

AS stands for average satisfaction. TQS stands for total questionnaire score and NQ stands for Number of Questionnaires.

IV. RESULT AND DISCUSSION

A. *Determination Number of Research Samples*

Respondents of this research is all members of the Telegram group "Mutual Fund Mentor 24" who used Ajaib and Bibit application so that respondents had the same opportunity in filling out the questionnaire.

The research sampling technique used Random Sampling with the solvin formula:

$$n = \frac{62}{62 \cdot (0.05)^2 + 1} = 54$$

B. *Validity Test Result*

The following description of the data used in the pretest validation test of the questionnaire in this research :

Sample (n) = 54, Degree of freedom (df) = df-2 = 54-2 = 52, Significance level (α) = 0.01, $r_{table} = 0.348$ (seen from the distribution of r table values at df = 52, $\alpha = 0.01$).

1. *Ajaib*

Statements related to the Ajaib application have 30 statements based on the PIECES component. The number of respondents used in this research amounted to 54 respondents with the category of mutual fund service users in the Ajaib application. The results of the validation test of the Ajaib

questionnaire statement using SPSS 25 shows in table 4.1 :

TABLE 4.1 Validity Test Results of Ajaib

Domain	Item	r _{count}	r _{table}	Description
Performance	X1	0.842	0.348	Valid
	X2	0.694	0.348	Valid
	X3	0.819	0.348	Valid
	X4	0.817	0.348	Valid
	X5	0.746	0.348	Valid
	X6	0.660	0.348	Valid
	X7	0.762	0.348	Valid
	X8	0.653	0.348	Valid
	X9	0.394	0.348	Valid
Information	X10	0.699	0.348	Valid
	X11	0.707	0.348	Valid
	X12	0.850	0.348	Valid
	X13	0.804	0.348	Valid
	X14	0.726	0.348	Valid
	X15	0.778	0.348	Valid
Economic	X16	0.774	0.348	Valid
	X17	0.804	0.348	Valid
	X18	0.883	0.348	Valid
Control	X19	0.852	0.348	Valid
	X20	0.816	0.348	Valid
Efficiency	X21	0.669	0.348	Valid
	X22	0.722	0.348	Valid
	X23	0.630	0.348	Valid
Service	X24	0.627	0.348	Valid
	X25	0.703	0.348	Valid
	X26	0.767	0.348	Valid
	X27	0.768	0.348	Valid
	X28	0.754	0.348	Valid
	X29	0.748	0.348	Valid
	X30	0.799	0.348	Valid

Based on Table 4.1, the results show that all values of $r_{count} > r_{table}$, so it can be concluded that all Ajaib statements are valid.

2. *Bibit*

Statements related to the Bibit application have 30 statements based on the PIECES component. The number of respondents used in this research amounted to 54 respondents with the category of mutual fund service users in the Bibit application. The results of the validation test of the Bibit questionnaire statement using SPSS 25 shows in table 4.2:

TABLE 4.2 Validity Test Results of Bibit

Domain	Item	r _{count}	r _{table}	Information
Performance	X1	0.809	0.348	Valid
	X2	0.739	0.348	Valid
	X3	0.876	0.348	Valid
	X4	0.804	0.348	Valid
	X5	0.720	0.348	Valid
	X6	0.825	0.348	Valid
	X7	0.855	0.348	Valid
	X8	0.806	0.348	Valid
	X9	0.366	0.348	Valid
Information	X10	0.853	0.348	Valid
	X11	0.852	0.348	Valid
	X12	0.779	0.348	Valid
	X13	0.853	0.348	Valid
	X14	0.723	0.348	Valid
	X15	0.838	0.348	Valid
Economic	X16	0.880	0.348	Valid
	X17	0.866	0.348	Valid
	X18	0.877	0.348	Valid

Control	X19	0.872	0.348	Valid
	X20	0.872	0.348	Valid
Efficiency	X21	0.793	0.348	Valid
	X22	0.839	0.348	Valid
	X23	0.722	0.348	Valid
Service	X24	0.767	0.348	Valid
	X25	0.827	0.348	Valid
	X26	0.874	0.348	Valid
	X27	0.861	0.348	Valid
	X28	0.746	0.348	Valid
	X29	0.817	0.348	Valid
	X30	0.855	0.348	Valid

Based on Table 4.2, the results show that all values of rcount > rtable, so it can be concluded that all Bibit statements are valid.

C. Reliability Test Result

Reliability test is conducted to test that instrument can be trusted or not. Reliability testing is done by the analysis using Cronbach's Alpha technique.

1. Ajaib

The summary of Ajaib Reliability test statement could be seen as Table 4.3 below:

TABLE 4.3 Reliability Test Result of Ajaib Case Processing Summary

		N	%
Cases	Valid	54	100.0
	Excluded ^a	0	.0
	Total	54	100.0
Reliability Statistics			
Cronbach's Alpha	N of Items		
.871	30		

Based on the results of table 4.3, it is found that the value of Cronbach's Alpha Information of Ajaib > 0.60 so it can be concluded that all statements are reliable.

2. Bibit

The summary of Bibit Reliability test statement could be seen as Table 4.4 below:

TABLE 4.4 Reliability Test Result of Bibit Case Processing Summary

		N	%
Cases	Valid	54	100.0
	Excluded ^a	0	.0
	Total	54	100.0
Reliability Statistics			
Cronbach's Alpha	N of Items		
.880	30		

Based on the results of table 4.4, it is found that the value of Cronbach's Alpha Information of Bibit > 0.60 so it can be concluded that all statements are reliable.

D. Result of the PIECES Method Questionnaire Recap

The statement is taken based on the PIECES method and the value is based on the Likert Scale, the results of the statement on the performance of mutual fund services on the Magic and Seed application are as follows:

1. Performance

The average amount in the performance variable is calculated based on the the total answers in each description multiplied by range of values that have been determined according to the Likert Scale.

1.1 Ajaib

The average number of performance indicators for Ajaib application based on user satisfaction as follows:

$$AS = \frac{(5 \times 1) + (150 \times 2) + (162 \times 3) + (147 \times 4) + (22 \times 5)}{(9 \times 54)} = \frac{1489}{486} = 3.06$$

The average result of the calculation based on the questionnaire statement shows that the performance value of the Mutual Fund feature in the Ajaib application is 3.06 with Quite Satisfied description.

1.2 Bibit

The average number of performance indicators for Bibit application based on user satisfaction as follows :

$$AS = \frac{(2 \times 1) + (52 \times 2) + (117 \times 3) + (273 \times 4) + (42 \times 5)}{(9 \times 54)} = \frac{1759}{486} = 3.62$$

The average result of the calculation based on the questionnaire statement shows that the performance value of the Mutual Fund feature in the Bibit application is 3.62 with Satisfied description.

2. Information

The average amount in the information variable is calculated based on the the total answers in each description multiplied by range of values that have been determined according to the Likert Scale.

2.1 Ajaib

The average number of information indicators for Ajaib application based on user satisfaction as follows :

$$AS = \frac{(4 \times 1) + (40 \times 2) + (111 \times 3) + (137 \times 4) + (32 \times 5)}{(6 \times 54)} = \frac{1125}{324} = 3.47$$

The average result of the calculation based on the questionnaire statement shows that the information value of the Mutual Fund feature in the Ajaib application is 3.47 with Satisfied description.

2.2 Bibit

The average number of information indicators for Bibit application based on user satisfaction as follows :

$$AS = \frac{(9 \times 1) + (62 \times 2) + (107 \times 3) + (126 \times 4) + (20 \times 5)}{(6 \times 54)} = \frac{1058}{324} = 3.27$$

The average result of the calculation based on the questionnaire statement shows that the information value of the Mutual Fund feature in the Bibit application is 3.27 with Quite Satisfied description.

3. Economic

The average amount in the economic variable is calculated based on the the total answers in each description multiplied by range of values that have been determined according to the Likert Scale.

3.1 Ajaib

The average number of economic indicators for Ajaib application based on user satisfaction as follows:

$$AS = \frac{(0 \times 1) + (41 \times 2) + (66 \times 3) + (44 \times 4) + (11 \times 5)}{(3 \times 54)} = \frac{511}{162} = 3.15$$

The average result of the calculation based on the questionnaire statement shows that the economic value of the Mutual Fund feature in the Ajaib application is 3.15 with Quite Satisfied description.

3.2 Bibit

The average number of economic indicators for Bibit application based on user satisfaction as follows:

$$AS = \frac{(3 \times 1) + (16 \times 2) + (59 \times 3) + (66 \times 4) + (18 \times 5)}{(3 \times 54)} = \frac{566}{162} = 3.49$$

The average result of the calculation based on the questionnaire statement shows that the economic value of the Mutual Fund feature in the Bibit application is 3.49 with Satisfied description.

4. Control

The average amount in the control variable is calculated based on the total answers in each description multiplied by range of values that have been determined according to the Likert Scale.

4.1 Ajaib

The average number of economic indicators for Ajaib application based on user satisfaction as follows:

$$AS = \frac{(1 \times 1) + (16 \times 2) + (49 \times 3) + (37 \times 4) + (5 \times 5)}{(2 \times 54)} = \frac{353}{108} = 3.27$$

The average result of the calculation based on the questionnaire statement shows that the control value of the Mutual Fund feature in the Ajaib application is 3.27 with Quite Satisfied description.

4.2 Bibit

The average number of economic indicators for Bibit application based on user satisfaction as follows:

$$AS = \frac{(1 \times 1) + (7 \times 2) + (40 \times 3) + (51 \times 4) + (9 \times 5)}{(2 \times 54)} = \frac{384}{108} = 3.56$$

The average result of the calculation based on the questionnaire statement shows that the control value of the Mutual Fund feature in the Bibit application is 3.56 with Satisfied description.

5. Efficiency

The average amount in the efficiency variable is calculated based on the the total answers in each description multiplied by range of values that have been determined according to the Likert Scale.

5.1 Ajaib

The average number of efficiency indicators for Ajaib application based on user satisfaction as follows:

$$AS = \frac{(1 \times 1) + (32 \times 2) + (64 \times 3) + (55 \times 4) + (10 \times 5)}{(3 \times 54)} = \frac{527}{162} = 3.25$$

The average result of the calculation based on the questionnaire statement shows that the efficiency value of the Mutual Fund feature in the Ajaib application is 3.25 with Quite Satisfied description.

5.2 Bibit

The average number of efficiency indicators for Bibit application based on user satisfaction as follows :

$$AS = \frac{(2 \times 1) + (28 \times 2) + (48 \times 3) + (68 \times 4) + (16 \times 5)}{(3 \times 54)} = \frac{554}{162} = 3.42$$

The average result of the calculation based on the questionnaire statement shows that the efficiency value of the Mutual Fund feature in the Bibit application is 3.42 with Satisfied description.

6. Service

The average amount in the service variable is calculated based on the the total answers in each description multiplied by range of values that have been determined according to the Likert Scale.

6.1 Ajaib

The average number of service indicators for Ajaib application based on user satisfaction as follows:

$$AS = \frac{(5 \times 1) + (73 \times 2) + (149 \times 3) + (127 \times 4) + (24 \times 5)}{(7 \times 54)} = \frac{1226}{378} = 3.24$$

The average result of the calculation based on the questionnaire statement shows that the service value of the Mutual Fund feature in the Ajaib application is 3.26 with Quite Satisfied description.

6.2 Bibit

The average number of service indicators for Bibit application based on user satisfaction as follows:

$$AS = \frac{(2 \times 1) + (46 \times 2) + (100 \times 3) + (196 \times 4) + (34 \times 5)}{(7 \times 54)} = \frac{1348}{378} = 3.57$$

The average result of the calculation based on the questionnaire statement shows that the service value of the Mutual Fund feature in the Bibit application is 3.57 with Satisfied description.

Based on the analysis of the Ajaib and Bibit application from 54 questionnaire respondents who are users of the two applications, the recap of the comparison results can be show on table 4.5:

TABLE 4.5 Recap of the Comparison of Ajaib and Bibit

Domain	Ajaib	Bibit
Performance	3.06 Quite Satisfied	3.62 Satisfied
Information	3.47 Satisfied	3.27 Quite Satisfied
Economics	3.15 Quite Satisfied	3.49 Satisfied
Control/Security	3.27 Quite Satisfied	3.56 Satisfied
Efficiency	3.25 Quite Satisfied	3.42 Satisfied
Service	3.24 Quite Satisfied	3.57 Satisfied

V. CONCLUSION AND RECOMMENDATION

A. Conclusion

Based on the results of study conducted, it can be concluded as below:

1. Based on user satisfaction, the Bibit application is satisfying with score of 3.62 on performance, 3.49 on economics, 3.56 on control/security, 3.42 on efficiency and 3.57 on service indicator while the Ajaib application is satisfying with score of 3.47 on Information indicator.

2. Based on the conclusion of point 1, it can be given input for Bibit application developers to improve application quality in terms of Performance, Economics, Control, Efficiency, and Service for Ajaib application and for Bibit developers to improve application quality from the Information side.

B. Recommendation

Based on the conclusions that have been described, the suggestions that can be developed in further research are:

1. Use or comparison using other methods to measure application performance, so that maximum results are obtained.
2. More developed related statements in the questionnaire.

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