

COMPARATIVE ANALYSIS OF USER SATISFACTION LEVELS ON LIVIN BY MANDIRI AND BSI MOBILE APPLICATIONS USING THE PIECES METHOD

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Abstract

In social life, transactions are inseparable from humans. In general, exchange activities and means of payment for goods are gradually being replaced in the modern world with the presence of banks to facilitate all human transactions. The central facilities provided by banks are mobile banking (M-Banking) or banking services through digital or mobile phones that function almost like ATMs. Livin By Mandiri and BSI Mobile are among the mobile banking providers, with around 62 million users. As a new thing that has just entered the country, mobile banking, especially applications launched for the needs of the community, requires satisfaction analysis. Aiming at these issues, this study examines the effectiveness and efficiency of the system from the following aspects: User interface convenience. The following research aims to analyze user satisfaction with Livin By Mandiri and BSI Mobile mobile banking applications. User satisfaction analysis is determined using qualitative research methods and PIECES or performance, information and data, economy, control and safety, efficiency, and service methods. The results showed that both applications had good performance according to PIECES indicators, but in terms of information, BSI Mobile outperformed Livin By Mandiri in the category, and the Livin By Mandiri application outperformed BSI Mobile in terms of efficiency. With these satisfactory results, Livin By Mandiri and BSI Mobile can be said to be very good, and this value must be maintained.

Keywords: Modern transaction, M-Banking, PIECES, Satisfaction Level, Customer

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INTRODUCTION

Transactions are an activity that cannot be separated from human life. Transactions usually use a medium of exchange called money as a means of payment and a legal sign in making a transaction. Currently, transaction activities have been made easier by banks that help customers carry out all transaction activities.

A bank is a Financial Intermediary Institution that is generally established with authority to accept money deposits lend money and issue a process known as *banknotes*. Meanwhile, according to *Law Number 10 of 1998*, a bank is a business entity that collects funds from the public in the form of deposits and distributes them to the public in the form of credit and or other forms in order to improve people's lives.

Currently, the Bank has been supported by easy transaction facilities to ensure the convenience and security of digital banking services. Digital Banking is a service and product that can be accessed by customers anytime and anywhere to facilitate transactions and increase customer satisfaction. This is reflected in the development of a customer service system in the form of *Mobile Banking (M-Banking)*. *Mobile banking* is one of the products of the development of technology and information adopted by banks. *Mobile banking* is the first step in the bank's evolution into a *Financial Software Provider (FSP)*. As an FSP or financial application service provider, banks will function to manage their customers' finances in the future. (Hardi, R., & Hardianto. (2015). Including bill payments and planning retirement funds. These services are personalized and tailored to the characteristics of the customer.

According to (Supriyatna, A. (2015). Mobile banking is a banking facility through mobile communications such as cell phones with the provision of facilities that are almost the same as ATMs except for taking cash. There are two forms of *Mobile Banking*, namely SMS banking, which is accessed by sending written messages, and WAP banking, a form of mobile internet service accessed via a GPRS (internet) connection. Mobile banking is an option because it is easy to use, practical, safer (based on cellular phone numbers), friendly, and convenient. (Supriyatna, A. & Maria, V, 2017).

For customers, *Mobile Banking (M-Banking)* provides many advantages and convenience in conducting a financial transaction because banks allow various banking services to be carried out independently (Self-Service) without having to visit a bank office. Customers can open an account, make transactions (cash, transfers, payments) and close a savings account. Thus, *Mobile Banking* refers to the delivery and use of banking financial services with the help of a cellular phone (*Smartphone*). (Aditya W. Utama, 2016).. Suryo (2005) says the advantage of M-banking is the use of a double or layered security network, namely from the operator that provides the cellular network and the network.



Figure 1. 2018-2020 Financial Services Map

In relation to the figure above, the digitization of financial services has an impact on all sectors. One of them is the Mobile Banking financial sector, where there are 62 million mobile banking users with a percentage value of 22%. According to a study by the research organization *Mobile Ecosystem Forum (MEF)* in 2014, 80% of the total 70 million bank customers in Indonesia have used mobile banking services. Although not as high as in other states, this figure is better than the global average and the achievements of various other Asian countries. There are already several banks implementing *Mobile Banking* in Indonesia, such as Bank Mandiri (Livin by Mandiri) and Bank BSI (BSI Mobile). (Pangestu, 2022).

PT Bank Mandiri (Persero) TBK is an Indonesian State-Owned Enterprise engaged in banking financial services. The bank was established on October 2, 1998, as part of the banking restructuring program implemented by the Indonesian government. On July 31, 1999, four banks owned by the Indonesian government, namely Bank Bumi Daya, Bank Dagang Negara, Bank Ekspor Impor Indonesia, and Bank Pembangunan Indonesia, were officially merged into this bank.

Bank Syariah Indonesia (BSI) is an Islamic banking institution. The bank was established on February 1, 2021; three state-owned subsidiary banks were merged nationally under the Ministry of SOEs. BNI Syariah, BRI Syariah, and Mandiri Syariah, the three banks merged into Bank Syariah Indonesia. The establishment of Bank Syariah Indonesia (BSI) was formalized through a letter issued by the Financial Services Authority (OJK). The letter released with Number SR-3/PB.1/2021 dated January 27, 2021, regarding the granting of permission to merge PT Bank Syariah Mandiri and PT Bank BNI Syariah into PT Bank BRI Syariah Tbk. (Dwiyantoro, 2019).

Based on the description above, a study is needed, namely a comparative analysis of the performance analysis of the Livin by Mandiri and BSI Mobile applications using a system that can later observe the effectiveness and efficiency of the system, measure how easily the user interface can be used and learned by application users. (Dilla. 2020).

PIECES is the main thing that deserves attention in analyzing the performance of information, economy, security, efficiency, and service to identify the weaknesses of the current system so that improvements can be recommended for the new system, according to (Nugraha (2017)). PIECES is a way to correct or improve information systems for decision-makers in an organization, meanwhile, according to (Indrawati, 2019). The PIECES method is an analysis method used as a basis for obtaining more specific problems. (Aditya, 2016). Some of the criteria that must exist in the PIECES method, according to James Wetherbe, include *Performance, Information and Data, Economics, Control and Security, Efficiency, and Service*.

This study departs from the background of the *research gap* in previous studies related to the use of the PIECES method on the level of information satisfaction that has an effective value, such as in a study entitled "Application of the PIECES Framework Method to the Satisfaction Level of the *Myindihome* Application Service Information System" conducted by (Aditya 2022) concluded that using the PIECES Framework method is considered very effective because it can analyze the system per variable so that the system can be evaluated more deeply, especially related but there are still obstacles that interfere with users. One of them is the *Information* variable, where the information provided is not in line with customer needs, as well as the information system between officers or technicians and customers who lack *chemistry* so that there is information that is not conveyed and causes miscommunication. In this case, the company PT Telekomunikasi Indonesia must provide more details in evaluating its service system so

that it can provide optimal results. Frequent communication with customers and field officers to find out more about their needs and desires, which can be evaluated in providing satisfaction with Indihome product services. Another study with the title "Application of the PIECES Framework Method in Analyzing and Evaluating the M-BCA Application" conducted by Randi Prayogi, Kresna Ramanda, Cahyani Budihartanti, and Arief Rusman (2021) concluded that with the M-BCA application, it is necessary to identify problems to find out how satisfied users are with the M-BCA application, one of which uses the PIECES method which consists of *Performance, Information, Economics, Control, Efficiency, and Service* in measuring the level of satisfaction with m-BCA application users. The results of the analysis found that the application of the M-BCA application was classified as good, although in the implementation, there were still some obstacles where the *Performance* indicator got the lowest score, which means there must be improvements to display the menu instantly according to user needs. (Indrawati. 2019). It is hoped that future research will add other indicators to improve the research results.

Finally, the research conducted by Wiwit Priyadi and Onny Marleen (2020) on "Website Analysis Using the PIECES Method at PT Majapahit Teknologi Nusantara" Analysis using the PIECES method has advantages and disadvantages, on the advantage side. Namely, the PIECES method describes specific problems based on an assessment of the PIECES aspects, as in this study, from the overall value, which has a very satisfied percentage, it turns out that there are statements from visitors who disagree with the *Efficiency* aspect, which states that information and website services cannot increase the quantity of information conveyed. (Dilla Seltika Canta, 2020) In addition, the time for delivery is very short and clear, and there is no discussion service on the website owned by PT Majapahit Teknologi Nusantara. It is hoped that PT Majapahit Teknologi Nusantara will improve the quality of information and discussion services so that website visitors get information about every questionable problem efficiently and effectively. (Dwiyantoro, D. 2019).

Based on several previous studies, in general, the PIECES Framework has a good effectiveness value, but there are a number that still require improvement, such as in the *information* variable, which can cause miscommunication in the delivery of information. As for other variables related to performance, which is the lowest value required for improvement in the instant appearance of the menu? The last is related to the efficiency aspect, which cannot convey the quantity of information from consumer questions. The following research aims to compare a number of parameters in determining user satisfaction in using the Livin By Mandiri and BSI Mobile applications.

RESEARCH METHODS

This research uses quantitative methods with the PIECES method approach, which has six elements (Indrawati, 2019), namely Performance, Information and data, Economics, Control, and security, Efficiency, and Service. The object of research is users of the Livin By Mandiri and BSI Mobile applications, totaling 110 respondents. Data collection is carried out in online media using *Google Form*. The analysis was carried out through several variables, namely the Validity Test, Reliability Test, calculation and analysis of the *Closed-Ended Questionnaire* model, and Likert Scale. Finally, user satisfaction was measured using Kaplan's standard theory.

Stating the research flow chart, the initial stage in the analysis is the formulation of research problems containing theoretical data in supporting research based on books and journals. The second stage continues with data collection by determining

respondents/samples, designing questionnaires based on six PIECES elements, and distributing questionnaires online to respondents. After the data is collected, validity and reliability tests will be carried out for data testing. The last stage is data processing, namely, the data will be processed in accordance with the elements in the PIECES method, namely Performance, Information & Data, Economics, Control & Security, Efficiency, and Service, and ends by analyzing and seeing the results of the analysis which explains the level of user satisfaction of the Livin and BSI Mobile applications.

Object of Research

The research object, namely users of the Livin By Mandiri and BSI Mobile applications, was chosen because on a basic basis until May 28, 2023, the Livin By Mandiri and BSI Mobile applications still received a fairly high rating of 3.8/5 and 3.6/5, which indicates that the application is quite attractive and used by smartphone users in conducting online banking transactions with a total of 110 respondents. Data collection is carried out in online media using *Google Forms*.

Research Indicators

In this study, there are six indicators derived from the PIECES method, which *are performance, information and data, economics, control and security, efficiency, and service*. In the details of the questions asked, namely.

Table 1. PIECES method indicator details

Variables	No.	Indicator	Description
<i>Performance</i> (Performance) X1	1	Throughput	The system is assessed by the amount of work (output) performed over time to meet the needs.
	2	Response Time	The time required by the system to perform the work process.
	3	Audibility	Whether or not the work functions performed by the system are in accordance with the standards set.
	4	Communication prevalence	Whether it is difficult for users to understand the interface or interface provided by the application
<i>Information and Data</i> (Information and Data) X2	1	Accurate	Where the information produced has a high level of accuracy/accuracy
	2	Relevant	Where the information produced has a high level of accuracy/accuracy
	3	Presentation of Information	Where information is presented in an appropriate form.
	4	Data Flexibility	Where information is easily customized to the needs

Economic (Economy) X3	1	Reusability	Where a program or part of a program can be reused in another program
	2	Resources	The amount of resources used includes human resources as well as economic resources.
Control Security (Control and Safety) X4	1	Integrity	Where access to software or data by unauthorized persons can be controlled.
	2	Security	Mechanisms that control or protect programs and data in information systems.
Efficiency (Efficiency) X5	1	Usability	User effort when learning and operating the system (Ease of operation).
	2	Maintainability	User effort in overcoming errors in the system (System repair)
Service (Service) X6	1	Accuracy	Whether the work process performed by the system is precise
	2	Reliability	Whether or not you can trust the performance of the system as desired
	3	Simplicity	Whether or not you can trust the performance of the system as desired

Testing

The tests in this study are validity test, reliability test, and calculation of questionnaire analysis using SPSS 25. (Pratisto, 2004).

RESULT AND DISCUSSION

The results of the study begin with the characteristics of the respondents to determine their age when assessing the PIECES indicators of the Livin By Mandiri and BSI Mobile applications.

Table 2: Age of Respondents

No.	Age (Years)	Number of Respondents	Percentage (%)
1	< 17 Years	0	0
2	17 - 25 Years	87	79,1
3	26 - 35 Years	15	13,6
4	> 35 Years	8	7,3
Total Respondents		110	100

Based on Table 1, it is explained that respondents aged < 17 years totaled 0 people with a percentage of 0%, respondents aged between 17-25 years totaled 87 people with a percentage of 79.1%, respondents aged between 26-35 years totaled 15 people with a percentage of 13.6%, and respondents aged > 35 years totaled eight people with a percentage of 7.3%.

Table 3. Gender

No.	Gender	Number of Respondents	Percentage (%)
1	Male	53	48,2
2	Female	57	51,8
Total Respondents		110	100

Based on Table 2, it is explained that male respondents totaled 53 people with a percentage of 48.2%, and female respondents totaled 57 people with a percentage of 52.8%.

The results of processing the questionnaire data using SPSS computing show that the number of calculations consists of 3 parts, namely the *pretest* validity and reliability tests and the *main* questionnaire. With the equation

$$n = 30$$

$$\text{degree of freedom (df)} = n - 2 = 28$$

$$\alpha = 0.05$$

$$rtabel = 0.3610 \text{ (dilihat dari rtabel df = 28 dan } \alpha = 0.05 \text{)}$$

The results of the Pretest validity test of the questionnaire from both the Livin By Mandiri and BSI Mobile applications show that all *r*count > table values at a significance value of 5% (0.05). Therefore, it can be concluded that all items or statements in this research questionnaire are valid, so they can be used as research instruments and can be distributed to 110 respondents through questionnaires.

After conducting the pretest validity test, the next test was the validity of the main questionnaire. Based on the results of the *pretest questionnaire* validity test, there were 23 statements that were declared valid. These 23 statements were tested again for validity as the *main* questionnaire to 110 respondents. Before determining the validity, first determine the number of respondents, *degree of freedom*, *alpha*, and the location of the table value. After determining the value of the table, you can calculate the count value with the SPSS 25 program. The results of the validity test of the Main Questionnaire for the Livin by Mandiri and BSI Mobile Banking applications show that the validity test consisting of 23 statements that have been distributed to 110 respondents is declared valid.

The reliability test results also consist of *pretest* and main questionnaires. The reliability test was conducted using the alpha formula. Significant tests were carried out at the level of $\alpha = 0.05$. The instrument can be said to be reliable or consistent, if the alpha value > *r*_table (0.6). The data questionnaire will be processed and recapitulated to be tested in order to obtain the desired results. The results show that the questionnaire consisting of six parameters, namely *performance*, *information & data*, *economics*, *control & security*, *efficiency*, and *service*, is very reliable or can be trusted from time to time because it has a *Cronbach's alpha* value greater than the minimum value of *Cronbach's alpha*, which is 0.6. Thus, all statements on the pretest questionnaire can meet the feasibility of the research.

The validity test stage of the main questionnaire reveals that the questionnaire consisting of six parameters, namely *performance*, *information and data*, *economics*,

control, and security, efficiency, and service, is very reliable or can be trusted from time to time because it has a *Cronbach's alpha* value greater than the minimum *Cronbach's alpha* value of 0.6. Thus, the questionnaire used as research meets the feasibility.

The discussion section describes the results of the activities and the results of data processing, interprets the findings or benefits logically, relates to relevant reference sources, and presents GAP analysis with previous research as a comparison of these findings with previous ones so that there is novelty in these findings.

In the description of the PIECES method, which is summarized in the form of each indicator, namely:

1. The performance of the Livin By Mandiri application obtained a value of 4.17 on a scale of 5 with the PUAS category, and the value of the BSI Mobile Application obtained 4.08 on a scale of 5 with the PUAS category. This can be interpreted if both applications already have good performance.
2. Information: The Livin By Mandiri application received a score of 4.17 on a scale of 5 with the SATISFYING category, and the value on the BSI Mobile Application received 4.24 on a scale of 5 with the VERY SATISFYING category. This can be interpreted if the two applications have accurate information and are easy for users to learn. However, BSI Mobile has superior information and category values compared to Livin By Mandiri.
3. Economy (Economic) The Livin By Mandiri application received a score of 4.16 on a scale of 5 with the PUAS category, and the BSI Mobile Application received a score of 4.13 on a scale of 5 with the PUAS category.
4. Control & Security The Livin By Mandiri application received a score of 4.00 on a scale of 5 with the PUAS category, and the BSI Mobile application received 3.94 on a scale of 5 with the PUAS category. In this domain, it gets the lowest score for both applications from other domains; this value can still be categorized with the PUAS category. This can be interpreted if the data security in the two applications can be trusted.
5. Efficiency: The Livin By Mandiri application received a score of 4.19 on a scale of 5 with the PUAS category, and the BSI Mobile Application received a score of 4.14 on a scale of 5 with the PUAS category. This can be interpreted that both applications have a good level of efficiency to relieve users in terms of cost and time and can be used for all groups; in this domain, Livin By Mandiri has a superior value compared to the BSI Mobile Application.
6. *Service* The Livin By Mandiri application received a score of 4.18 on a scale of 5 with the PUAS category, and the BSI Mobile application received a score of 4.11 on a scale of 5 with the PUAS category. It can be interpreted that both applications have a good level of service to support users in running the application easily.

The results of the PIECES method above reveal that there are a number of indicators that meet good performance and two indicators that outperform each other from 2 applications. This means that in application services, both Livin By Mandiri and BSI Mobile are quite good and must be maintained.

Table 4. Livin By Self Calculation Results

No	Parameters	Value	Description
1	Performance	4,17	Satisfied

2	Information	4,17	Satisfied
3	Economics	4,16	Satisfied
4	Control & Security	4,00	Satisfied
5	Efficiency	4,19	Satisfied
6	Service	4,18	Satisfied

Table 5. Mobile BSI Calculation Results

No	Parameters	Value	Description
1	Performance	4,08	Satisfied
2	Information	4,24	Very Satisfied
3	Economics	4,13	Satisfied
4	Control & Security	3,94	Satisfied
5	Efficiency	4,14	Satisfied
6	Service	4,11	Satisfied

The results of the questionnaire calculation using the PIECES method and the Likert Scale show that the highest value in the Livin By Mandiri application is in the *Efficiency* parameter of 4.19, and the lowest value is in the *Control and Security* parameter of 4.00. As for the BSI Mobile application, the highest value for the Information parameter is 4.24, and the lowest value for the *Control & Security* parameter is 3.94.

The Livin By Mandiri application has a slightly higher range of values than the BSI Mobile application, so it can be concluded that the level of usability of the Livin By Mandiri application is better than that of BSI Mobile.

CONCLUSION

Based on the discussion of the results of data research and analysis conducted on users of the Livin By Mandi and BSI Mobile applications with 110 user respondents with the PIECES method above, the research results are obtained in the form of each PIECES Indicator of the Livin By Mandiri and BSI Mobile applications having good performance so that they are included in the PUAS category, namely in the aspects of Performance, Economy, Control & Security and Service. (Control & Security) and Service (Service) as for aspects that outperform each other, there are only a few aspects, namely Information (Information), with the value of BSI Mobile being superior to Livin By Mandiri and the opposite result in the Efficiency aspect which Livin By Mandiri is superior to BSI Mobile.

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