The Application of Delon and McLean Method and End User Computing Satisfaction to Analyze User Satisfaction of Mobile Banking Applications

Yoana Amelia Dewi[1*], Sabda Imanirubiarko[2], Dwi Maria Simbolon[3], Munir Tubagus[4], Tanti Widia Nurdiani[5]

[1]Program Studi Administrasi Bisnis, Politeknik LP3I, Indonesia
[2]Program Studi Manajemen, Universitas Pradita, Indonesia
[3]Program Studi Perdagangan Internasional, Institut Bisnis Informasi Teknologi dan Bisnis, Indonesia
[4]Program Studi Ekonomi Islam, Institut Agama Islam Negeri Manado, Indonesia
[5]Program Studi Manajemen, Universitas Islam Raden Rahmat, Indonesia

E-Mail: [1]yoanaamelia@plb.ac.id, [2]sabdaimani@gmail.com, [3]dwimariasimbolon2022@gmail.com, [4]munir.tubagus@iain-manado.ac.id, [5]tanti_widia@unira.ac.id

Abstract

The purpose of this study is to identify the variables that affect users' satisfaction with mobile banking apps. This study was carried out with a quantitative methodology. This study employed a survey approach for data collecting, employing an online Google Form to deliver a questionnaire instrument. Users of mobile banking apps make up the study's demographic. Purposive sampling was used to choose 200 samples with active user criteria, ensuring that the participants in the study who answered the questionnaire were actual users of the mobile banking app. After that, analysis was done with Smart-PLS software and the PLS-SEM technique based on outer and inner models and demographics. It is possible to draw the conclusion that, in general, consumers are happy with the mobile banking application based on the discussion's outcomes. The variables content, accuracy, convenience of use, timeliness, system quality, information quality, and service quality that affect user satisfaction with the mobile banking application are the subject of seven recognized theories. One hypothesis is found to be false. This indicates that consumer happiness is unaffected by the variable. According to the study's findings, in order to keep users of the mobile banking app satisfied, it is imperative to maintain or enhance the system's quality, information quality, convenience of use, timeliness, content, and service quality.

Keyword: DeLone and McLean, EUCS, Mobile Banking, User Satisfaction

1. INTRODUCTION

The advancement of computer and information technology is currently expanding quite quickly. As technology advances over time, there is a greater opportunity for human-computer connection. Computer and internet-related technology frequently provides answers to the majority of current issues and needs, particularly those pertaining to an activity's efficacy and efficiency. The internet may be used for more than just information searches; it can also be utilized as a marketing tool to make purchases and complete other tasks swiftly and easily. The digital age has brought about a number of significant developments for businesses, one of which is the inextricable link between information media and the internet. In March 2021, there were 212.35 million internet users in Indonesia. Indonesia now holds the third-most-high number of internet users in Asia. The internet has an increasing annual impact on life [1]. This demonstrates how the internet still has an impact on people's lives and how important it is to them on a daily basis. The banking industry is one that keeps up with the advancements in information technology and the internet. Given that the public now considers banking services to be essential, both government and commercial banks in Indonesia are currently in competition with one another to provide the best goods they can. Customers can now use a service that supports a variety of banking customer activities, such as using the mobile banking service, to make banking transactions easier [2].

Mobile banking was first launched by Excelcom at the end of 1995, and Bank Central Asia (BCA) was the bank that first launched mobile banking services in Indonesia. The background to the emergence of mobile banking is due to banks wanting to gain the trust of their customers; one way is by implementing technology. One of the banking priorities is to develop cardless payment tools. Until now, banking has provided convenience in every feature, including creating new accounts online via smartphone. With the features provided in the mobile banking application service, customers don't need to bother coming to the branch office

to open an account [3]. Customers can open an account anytime and anywhere if they have a smartphone connected to the internet to access the mobile banking service. In general, mobile banking makes it easy for all customers to carry out financial transactions anytime and anywhere, as long as they are connected to the internet [4]. Currently, the mobile banking application has the highest number of active users. In its use, there are still shortcomings in the application that make users give it a small rating [5]. The application still often experiences many problems where the content in the mobile banking application is still problematic, such as the absence of an inbox on the m-info feature for some users, the user interface display is old-school, the visuals of the application are less attractive, there are difficulties in viewing transaction history, and there are those who experience lost balances but the data is not in the account transfer, so these problems make users less satisfied with using the mobile banking application [6]. There are still several problems with the application, including the indicator light, which is always red; the indicator light is inaccurate because it cannot carry out transactions even though the indicator light is green; customers cannot check balances and transfer money; time loading on the application page; and not getting a code. OTP so that users have difficulty logging in to the application [7].

The level of user satisfaction can decrease if there are technical problems that occur in the application system, interface display problems in the system, and hardware difficulties that can make things difficult for users. Technology and infrastructure issues can be an obstacle to user satisfaction. User satisfaction is an important thing for service providers in companies and agencies [8]. Satisfaction means a person's feeling of satisfaction, pleasure, and relief when using a product or service to obtain a service. The level of satisfaction is a function of the difference between perceived performance and what is expected. Users will be disappointed if expectations do not match reality [9]. However, when the performance matches what is expected, the user will feel happy. A successful information system or application is not only determined by how a system can be processed and produces good information but also by user acceptance or satisfaction with the perceived performance of the system or application [10]. User satisfaction is an important thing for service providers in companies and agencies. The level of satisfaction is a function of the difference between perceived performance and what is expected. If performance is below expectations, users will feel disappointed. If the performance matches what is expected, the user will feel happy. Acceptance and satisfaction with information systems can be measured using several evaluation models [11].

As of right now, no research has been published that examines user happiness with mobile banking via the lenses of the End User Computing happiness (EUCS) and the DeLone and McLean development models. However, in terms of technological features and the information system's effectiveness, it is crucial to understand what factors can affect user happiness. One of the keys to a business's ability to survive in the market is user pleasure, particularly in light of the fiercer competition [12]. If a program fulfills or surpasses the expectations of the user, the user will be satisfied. Owing to a number of these issues, researchers developed an interest in examining user happiness with mobile banking applications in order to identify the variables that may affect user satisfaction and subsequently improve them. User satisfaction with applications can be analyzed using a variety of techniques. Researchers employ the End User Computing Satisfaction (EUCS) and the DeLone and McLean methodology to perform research based on prior study findings [13].

A technique for assessing information systems using satisfaction metrics is called EUCS (End User Computing Satisfaction). In 1988, Doll and Torkzadeh created the EUCS model. The end-user's happiness with technology aspects is emphasized in this concept. The content, correctness, form, timeliness, and system usability are all measured in EUCS. It is crucial to attain effective user happiness with an information system, particularly when considering user satisfaction and system viability [14]. Researchers utilize the EUCS model, one of the most well-known and often tested models, to quantify user or system user satisfaction. End User Computing Satisfaction (EUCS) is a technique that compares an information system's expectations and reality to determine how satisfied users are with the application system. If an application or information system is of high quality and can satisfy its users, then it may be trusted. One measure of the success of information system developers is user happiness. In 1992, the DeLone and McLean model—a model of information system success—was published [15]. Six dimensions—information quality, system quality, use, user satisfaction, individual impact, and organizational effect—are attempted to be explained by the DeLone and McLean model. The information systems success model proposed by William H. DeLone and Ephraim R. McLean is known as the DeLone and McLean model. Both the original and most recent iterations of the DeLone and McLean models have gained popularity as frameworks in information systems research in recent years. The majority of the variables make a significant contribution to the dependent variable's precision [16]. IF According to other research, user satisfaction can be measured based on information quality, system quality, and service quality in the DeLone and McLean models. Quality (system quality, information quality, and service quality) has a significant positive influence on user satisfaction [17].

2. MATERIALS AND METHOD

This study was carried out with a quantitative methodology. In line with the research procedures, which will be discussed in the next chapter, a number of research phases, including quantitative methodologies, techniques, and instruments, are employed based on the chosen approach. This study employed a survey

approach for data collecting, employing an online Google Form to deliver a questionnaire instrument. Statistical methods and corresponding software are used in data analysis. Users of mobile banking apps make up the study's demographic. To ensure that the respondents who completed the study's questionnaire were actual users, a purposive sampling technique was used with a sample size of 200. The criterion for inclusion in the sample was being an active user of the mobile banking application.
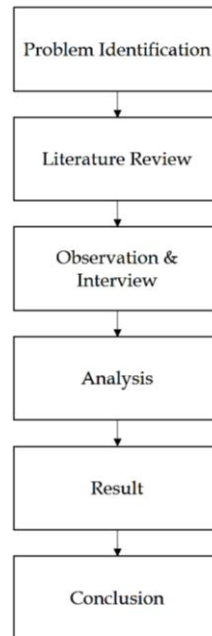

Figure 1. Research Flowchart

This study employs Doll and Torkzadeh's End User Computing Satisfaction (EUCS) research model, in which the End-User Computing Satisfaction approach compares users' expectations with the actual state of an information system to determine how satisfied users are with an application. Next, analysis was carried out using the PLS-SEM approach based on demographics and outer and inner models with Smart-PLS software. The research results obtained are then interpreted, and conclusions are drawn.

3.   Results and Discussion

Of the 200 responders, forty percent are male and sixty percent are female, according to the findings of the demographic analysis. This can happen because, when distributing the questionnaire indirectly or online via social media, the majority of female respondents filled out the questionnaire. This is in accordance with the ICT usage survey, which found that social media users are dominated by women. The respondents in this study were dominated by those aged 18–23 years, namely 180 people, and the second largest were respondents aged 24–30 years, namely 13 people. This is in accordance with previous research, which found that the majority of digital banking users are from the millennial generation. 104 people have used the mobile banking application for more than 2 years, namely with a percentage of 50%; 80 people have used it for 1-2 years. The platform most widely used by respondents in this research is Android, namely 140 with a percentage of 60%. 50% of 200 respondents, namely 100 respondents, felt satisfied with the application as a whole; 40% of respondents, namely 80 respondents, felt very satisfied with the application; and 9% of respondents, felt quite satisfied with the application. According to these findings, the majority of customers are extremely happy with the mobile banking app overall, while other users are just moderately happy. This is consistent with other study findings that users of mobile banking applications expressed satisfaction with the application. This indicates that in order to keep raising customer happiness, the mobile banking application needs to be improved.

The degree of user satisfaction with the content is 4.1, according to the analysis of the measurement of user happiness, indicating that the user is happy with the content that is offered in the application. The user satisfaction level in the accuracy variable is 4.5, indicating that the user is content with the application's information's accuracy. The format variable's value of 4.2 indicates that the user is happy with the format that the application is displaying. The user satisfaction level for the ease of use variable is 4.4, indicating that users are content with the application's ease of use. The user satisfaction level value for the timeliness variable is 4.4, indicating that the user is content with the application's timeliness. Additionally, the user is satisfied with the quality of the application system, as indicated by the system quality variable's value of 4.3. Users are happy with the quality of the information the application presents, as indicated by the user satisfaction level of 4.3 for

the information quality variable. In conclusion, the user satisfaction level, a measure of service quality, is 4.5, indicating that users are content with the amount of service the programme offers. With an average score of 4.2, application users' overall happiness level is at the satisfaction level, indicating that they are content with the programme overall. This outcome is consistent with earlier studies' findings that users of the programme are satisfied with it. This indicates that in order to keep raising user happiness, the application needs to be improved.

We can say that the overall results at each stage of the test met the requirements of the test because the measurement model analysis of the model used in the research showed that the outer loading value for each item in the first stage was above 0.7. Deletion of one indicator, namely FOR 1. The second stage is internal consistency reliability testing; the results in this study have shown that the composite reliability value is above the threshold, namely 0.7. The third stage, namely the average variance extracted (AVE) testing stage in this study, is already good because it has reached. The minimum AVE value is 0.5, and the final stage is discriminant validity, where the test results in this study show results that are in accordance with the test terms and conditions. In addition to the effect size (f2) value of 0.03 indicating that the content variable has a small influence on user satisfaction, the results of the relative impact test (q2) value of 0.01 and the strong coefficient of determination (R2) value of 0.7 also show that the content variable has a relatively small influence on user satisfaction. However, the significant path coefficient test result of 0.1 and the t-test value of 2.02 support the acceptance of the CON → US hypothesis. This suggests that the content variable (CON) has a substantial impact on user pleasure. These results show that the quality, utility, relevance, and diversity of presentation all have a substantial impact on the user happiness variable, and that there is a direct correlation between improved application content and increased user satisfaction. The results of this study are consistent with previous research showing that content affects user satisfaction.

The model's structural analysis produced remarkable findings, as evidenced by the coefficient of determination (R2), which was 0.72. produces an effect size (f2) value of 0.04, indicating that the accuracy variable has very little effect on user satisfaction. The t-test result of 2.3 suggests that the hypothesis ACC → US is accepted. In a similar vein, the relative impact test value (q2) is 0.01 and suggests that there is little to no correlation between the user happiness and accuracy factors. A significant path coefficient test result value of 0.15, which indicates that the accuracy variable (ACC) strongly affects user pleasure, lends support to this. These results show that accuracy indicators such as correctness, reliability, and harmony of the system's input and output have a considerable impact on the user satisfaction variable. This suggests that when data and information in the application are of high quality and relevance, user satisfaction rises. The study's conclusions are in line with other research showing that customer satisfaction is impacted by accuracy.

The structural examination of the model yielded impressive results, with the coefficient of determination (R2) coming in at 0.72. yields a relative impact test result (q2) of 0.000, indicating that the relationship between the format variable and user happiness is relatively minor, and an effect size (f2) value of 0.011, indicating that the format variable has a small influence on user satisfaction. The t-test value is 1.300, and the path coefficient test result value is not significant, namely 0.092, so the FOR → US hypothesis is rejected. This means that the format variable (FOR) has no influence on user satisfaction, and FOR → US does not have a significant relationship. These results prove that the format variable indicators, namely attractiveness, clarity, learnability, and ease of use of the application, have no effect and have an insignificant relationship with the user satisfaction variable, which means that the format has no effect on user satisfaction, where user satisfaction is not influenced by the appearance of the application. The results of this research are in accordance with previous research, which stated that format has no effect on user satisfaction. However, this result is inversely proportional to other research conducted, which found that the format variable had an effect on user satisfaction. This can be taken into consideration to improve the format aspect, because format can indirectly influence user effectiveness and the scale of user satisfaction.

The robust coefficient of determination (R2), which stands at 0.72, is demonstrated by the findings of the model's structural analysis. yields an effect size (f2) value of 0.05, indicating a negligible impact of the ease of use variable on user satisfaction. Similarly, the user satisfaction and ease of use variables have a relatively small association, as indicated by the relative impact test value (q2) of 0.02. However, the EOU → US hypothesis is accepted with a t-test value of 2.4. This is supported by a significant path coefficient test result value of 0.2, which shows that user satisfaction is significantly impacted by the ease of use (EOU) variable. These findings demonstrate the significant influence and relationship between the user satisfaction and ease of use variables. In other words, user satisfaction and ease of use are positively correlated, with users of mobile banking applications reporting higher levels of satisfaction when using an application that is simple to use. The findings of this study support earlier studies that found user satisfaction is influenced by simplicity of use.

The structural examination of the model yielded impressive results, with the coefficient of determination (R2) coming in at 0.7. yields a value of 0.03 for the effect size (f2), indicating a negligible impact of the timeliness variable on user satisfaction. Similarly, the customer happiness and timeliness have a weak association, as indicated by the relative effect (q2) test value of 0.004. With a t-test result of 2.1, the TIM →

US hypothesis is supported nonetheless. Path coefficient testing, on the other hand, produced a negligible result (-0.1), indicating that user happiness is not significantly impacted by the timeliness variable. These findings demonstrate that, while not statistically significant, timeliness has an impact on the user satisfaction variable, indicating the importance of timely and current information. Timeliness, however, has a negligible impact and, even if it were to grow, would not materially improve user satisfaction with the mobile banking app. The study's findings support other studies' findings that there was no discernible relationship between timeliness and satisfaction. These findings, however, conflict with those of other studies, which show that timeliness significantly affects user happiness. The study's findings indicate that while timely information systems have an impact on user satisfaction, those effects are not very great.

The structural examination of the model yielded impressive results, with the coefficient of determination (R2) coming in at 0.72. yields an effect size (f2) value of 0.04; this indicates a negligible impact of the system quality variable on user satisfaction. Additionally, the relative impact test value (q2) is 0.014, indicating a weak correlation between the system quality characteristics and user happiness. However, the SQ → US hypothesis is supported by the t-test value of 2.08. This is corroborated by a significant path coefficient test result value of 0.18, which shows that user happiness is significantly impacted by the system quality (SQ) variable. These findings show a clear relationship between system quality and user satisfaction, suggesting that higher levels of maintainability, access speed, and security in the mobile banking application system will translate into higher levels of user satisfaction. The findings of this study support earlier research that found that system quality affects user satisfaction since an information system that can satisfy its users' needs will see an improvement in user happiness.

The structural analysis's findings indicate that the coefficient of determination (R2), which stands at 0.72, is rather high. yields an effect size (f2) value of 0.04, indicating a negligible impact of the information quality variable on user satisfaction. With a t-test result of 2.1, the IQ → US hypothesis is supported. Similarly, the relative impact test value (q2) is 0.01, indicating that the relationship between the accuracy and user satisfaction variables has a relatively minor influence. This is demonstrated by a substantial path coefficient test result of 0.2, which shows that user happiness is significantly impacted by the information quality (IQ) variable. These findings clearly show that information quality and user satisfaction are significantly correlated, meaning that reliable and current information found in mobile banking applications will boost customer satisfaction. The results of this study align with previous research suggesting that user satisfaction is influenced by information quality and that a system producing higher-quality information can further boost user satisfaction based on user perceptions.

The strong coefficient of determination (R2), which stands at 0.7, is demonstrated by the findings of the structural analysis of the model. yields an effect size (f2) value of 0.06, indicating a negligible impact of the service quality variable on user satisfaction. Additionally, the relative impact test score (q2) is 0.02, indicating a weak correlation between the system quality characteristics and user happiness. However, the SERVQ → US hypothesis is supported by the t-test value of 2.5. This is supported by a significant path coefficient test result value of 0.2, which shows that user satisfaction is significantly impacted by the service quality variable (SERVQ). These findings clearly show that user satisfaction and service quality are significantly correlated, meaning that higher levels of responsiveness and guaranteeing the quality of service provided by the mobile banking app will translate into higher levels of customer satisfaction. The study's findings support earlier research that found that an information system's ability to provide high-quality services will boost user happiness. Therefore, service quality has an impact on user satisfaction. This can happen because users will feel satisfied if the implementation of the information system application can be achieved. Supporting user goals and expectations will increase user satisfaction.

4. CONCLUSION

The discussion's outcomes lead to the following conclusion: Users are generally satisfied with the mobile banking application, according to the results of the user satisfaction survey. Based on the analysis's findings, it is known that seven hypotheses content, accuracy, ease of use, timeliness, system quality, information quality, and service quality have been found to be significant predictors of users' satisfaction with mobile banking applications. As a consequence of the analysis that was done, one hypothesis was found to be unfounded. This indicates that there is no relationship between the format variable and user satisfaction (user satisfaction). According to the study's findings, in order to keep users of the mobile banking app satisfied, it is imperative to maintain or enhance the system's quality, information quality, convenience of use, timeliness, content, and service quality. Drawing from the findings of the conducted research, a number of recommendations have been made that may warrant consideration in future studies. These include the following: The relationship between the variables is the variable that is rejected based on the findings of research that has been conducted by researchers. Therefore, researchers can recommend that the format variable be reviewed for user satisfaction or that a different variable that has been shown to have a significant impact be used in its place. It is advised to conduct additional research in order to develop or apply additional models, such as the Expectation Confirmation Model (ECM) and the Technology Acceptance Model (TAM), to analyze

user satisfaction with an application. In order to ensure that the research findings can be broadly applied, it is advised that future studies focus more on comparing the distribution of sample data with the distribution of respondent data overall, for the categories of gender, age, duration of application use, and other categories during the respondent data collection process.

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