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User Experience Analysis of Mobile Banking Applications in Indonesia Using Usability Testing and the User Experience Questionnaire (UEQ): A Case Study of Bank Syariah Indonesia

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Abstract

This study aims to explore user experiences in utilizing mobile banking applications in Indonesia through usability testing and the User Experience Questionnaire (UEQ). The rapid growth of mobile banking technology necessitates a focused approach to understanding user experiences to ensure applications are both efficient and satisfying to use. Usability testing is employed to evaluate how well mobile banking applications meet user needs and expectations. Users perform a series of tasks designed to cover the core features of the application, while researchers observe and record responses, difficulties, and the time required to complete each task. The results of the usability testing provide detailed insights into specific issues encountered by users when interacting with mobile banking applications. These findings offer an in-depth perspective on the strengths and weaknesses of existing mobile banking applications in Indonesia. This information can guide application developers in implementing necessary improvements and enhancements, ensuring that users have a more satisfying and efficient experience when using mobile banking services. Furthermore, this study contributes to raising awareness and understanding of user-centered development practices in mobile banking application design in Indonesia.

Keywords: *user experience, usability testing, mobile banking applications*

INTRODUCTION

In the digital era, technological advancements in Indonesia have transformed various aspects of life, including the financial sector. According to Statista (2023), the number of mobile banking users in Indonesia has risen significantly, reaching over 60 million active users in 2023, making these applications the primary means of financial transactions for urban communities. Emerging technologies enable companies, including state-owned enterprises (SOEs), to remain competitive in this era of digital transformation. A prime example is Bank Syariah Indonesia (BSI), the result of a merger between Bank Mandiri Syariah, Bank Negara

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Indonesia Syariah, and Bank Rakyat Indonesia Syariah, which launched the BSI Mobile Banking application to meet the needs of modern society (Widharto et al., 2020). Mobile banking applications provide users with the convenience of managing finances, conducting transactions, and accessing banking services swiftly. According to Tomasi and Ilankadhir, (2024), convenience and accessibility are key factors driving the high adoption of mobile banking technologies in many developing countries, including Indonesia. However, studies indicate that complex interfaces, unintuitive user experiences, and security issues often present significant barriers to the effective use of mobile banking applications (Ali et al., 2024; Zulaiha & Triana, 2021).

The BSI Mobile Banking application offers various features such as balance inquiries, fund transfers, zakat payments, and other transactions based on Sharia principles. Despite these features facilitating transactions, user experiences often vary depending on interface design and application reliability. Previous research by Hamidi and Mohammadi (2024) found that a simple user interface and responsive application design significantly enhance user satisfaction. According to Hardi et al. (2023), usability testing is an effective method for evaluating how well applications meet user needs. In the context of mobile banking applications, such testing involves tasks like registration, fund transfers, and bill payments. Ooi and Tan (2016) highlighted that observing user difficulties during these tasks provides valuable insights for application developers.

Additionally, the User Experience Questionnaire (UEQ) is a crucial tool for understanding user perceptions of an application. The UEQ allows researchers to measure emotional aspects such as satisfaction, stimulation, and user concerns during their interaction with mobile banking applications (Qatawneh & Makhlouf, 2023). Research by (Elbadrawy & Aziz, 2012) demonstrated a direct correlation between positive user experiences and user loyalty to an application. This study combines usability testing and the UEQ method to deliver a holistic evaluation of mobile banking applications in Indonesia. The findings not only identify challenges in application usage but also offer practical guidance for improving application design and functionality. As noted by Mgiba and Shukla (2024), integrating quantitative and qualitative data in application evaluations can yield deeper and more actionable recommendations.

Given the growing demand for reliable mobile banking services, this research aims to contribute to the development of improved applications, particularly in the context of interface design and user experience. These findings are relevant not only to BSI but also to other application developers striving to provide efficient and satisfying financial services to users in Indonesia.

METHOD

This study employs a heuristic evaluation method focusing on usability testing and the User Experience Questionnaire (UEQ) to evaluate user experiences in utilizing mobile banking applications. Heuristic evaluation is a widely adopted approach to assess user interfaces and application functionalities based on established usability principles (Alshamari & Althobaiti, 2024). In the context of this study, usability testing is implemented to measure how well the application meets user needs by observing participants as they complete specific tasks, such as account registration, fund transfers, and bill payments. This process yields empirical data on efficiency, effectiveness, and user satisfaction, which are crucial in

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identifying challenges and obstacles encountered during user interactions with the application (Rohmiyati et al., 2024; Triana & Zulaiha, 2022).

Additionally, the study incorporates the User Experience Questionnaire (UEQ) as a tool to gauge users' emotional responses and perceptions of the application. UEQ is designed to evaluate dimensions of user experience such as attractiveness, efficiency, clarity, and stimulation (Sandhiyasa et al., 2022). By combining insights from usability testing and UEQ, the research not only assesses the technical performance of the application but also identifies factors that holistically influence user satisfaction and loyalty. The integration of these two methods offers a comprehensive approach to understanding user needs and expectations while providing actionable insights to enhance the design and functionality of mobile banking applications.

RESULTS

Testing with the User Experience Questionnaire

Using the User Experience Questionnaire (UEQ) method, evaluations were conducted with 43 respondents. Among them, 55.8% were users of the BSI Mobile application for less than one year, while 44.2% had been using the application for 1 to 3 years. The evaluation also provided design improvements and feedback as solutions to identified issues.

Subsequently, each item or question in the User Experience Questionnaire (UEQ) was analyzed by calculating the average score based on the responses collected from participants. This process involved converting responses into numerical values, following the guidelines established by the UEQ methodology. Statistical analysis tools were utilized to process this data, generating average scores for each UEQ scale, such as attractiveness, efficiency, clarity, reliability, and stimulation.

The results of these calculations are presented in table format to facilitate data interpretation and pattern identification. In Table 1, the average scores for each UEQ scale reflect users' perceptions of the application, encompassing both its functionality and the emotional experience it provides. This data offers valuable insights for developers, highlighting design elements that require improvement to better meet users' needs and expectations.

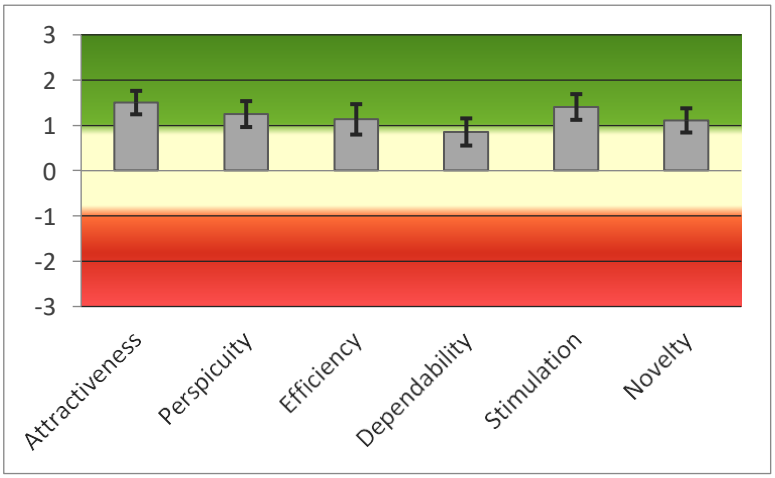


Chart 1. User Experience Questionnaire (UEQ) evaluation

The chart above illustrates the results of the User Experience Questionnaire (UEQ) evaluation for a specific application, focusing on six dimensions of user experience: Attractiveness, Perspicuity (clarity), Efficiency, Dependability, Stimulation, and Novelty. The

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scores in this chart range from -3 (very negative) to +3 (very positive), with color bars indicating perceptions: red (negative), yellow (neutral), and green (positive). As shown in the calculations presented in chart 1, the Attractiveness scale achieved an average score of 1.504, the Perspicuity scale scored 1.250, the Efficiency scale scored 1.134, the Dependability scale scored 0.855, the Stimulation scale scored 1.407, and the Novelty scale scored 1.110. According to the evaluation standards, a mean value between -0.8 and 0.8 indicates a neutral evaluation, while a mean value above 0.8 indicates a positive evaluation, and a mean value below -0.8 indicates a negative evaluation. The results for BSI Mobile Banking overall show a positive user evaluation.

After calculating the average scores for the BSI Mobile Banking application using the User Experience Questionnaire (UEQ), these scores were analyzed in comparison to the UEQ benchmark dataset. The benchmark dataset serves as a standardized reference for evaluating user satisfaction across various products and is divided into five categories of user experience quality: poor, below average, above average, good, and excellent. These categories provide a clear framework for interpreting the results. Each mean score derived from the BSI Mobile Banking application was mapped against the corresponding benchmark category to assess the application's performance. This process allowed for a comprehensive evaluation of the application, highlighting how it performs relative to other products in the benchmark dataset. By identifying whether the application's scores fall into the lower or higher ranges of user satisfaction, the analysis positions the BSI Mobile Banking application within the broader spectrum of user experience quality.

Furthermore, this benchmarking comparison serves as a diagnostic tool, pinpointing specific areas of strength where the application excels and areas of weakness that may require targeted improvements. By situating the application in this context, stakeholders can better understand its competitive standing in terms of user experience and prioritize enhancements that align with user expectations and industry standards.

The chart 2 represents the evaluation of the BSI Mobile Banking application using the UEQ (User Experience Questionnaire) framework. It visualizes the mean scores of six user experience variables (Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation, and Novelty) compared against the UEQ benchmark categories: *Excellent*, *Good*, *Above Average*, *Below Average*, and *Bad*.

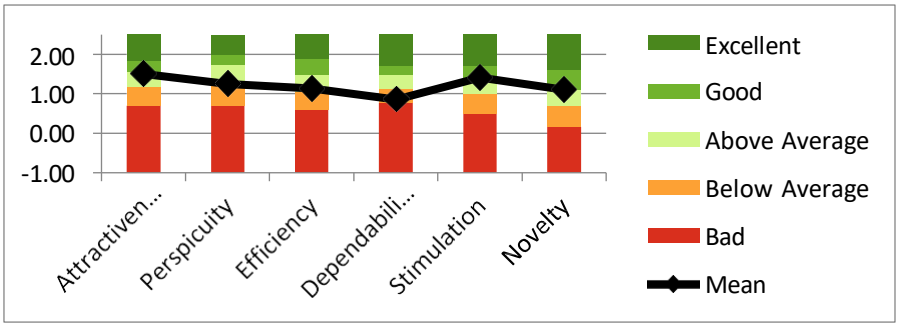


Chart 2. the User Experience Questionnaire (UEQ) Mean Score

The comparison of the UEQ (User Experience Questionnaire) benchmark in the chart highlights the performance of the BSI mobile banking application across six dimensions of user experience: Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation, and Novelty. The average scores for each dimension were evaluated against five UEQ benchmark categories: Bad, Below Average, Above Average, Good, and Excellent. The results reveal that

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all dimensions of the application scored above the neutral point (0), indicating an overall positive user experience. The Stimulation dimension achieved the highest score, approximately 1.4, positioning it between the Above Average and Good categories. This suggests that the application successfully delivers an enjoyable and engaging experience, reflecting its ability to foster emotional connection with users. Additionally, the Efficiency and Dependability dimensions also exhibited strong performance, with scores of approximately 1.2 and 1.1, respectively. These results demonstrate that the application is not only efficient in helping users achieve their goals but also dependable in ensuring reliability and trustworthiness. However, the Novelty dimension recorded the lowest score among the six, approximately 1.0, placing it within the Above Average category. While this score is still positive, it indicates that the application is less distinguished in terms of innovation or creativity when compared to other products in the benchmark. Enhancing this dimension could help the application stand out more prominently and differentiate itself from competitors, thereby increasing its overall appeal and user satisfaction.

Heuristic Evaluation Testing

The heuristic evaluation process was conducted by involving three evaluators who possess substantial knowledge and expertise in user interface (UI) design and usability principles. These evaluators are specialists in different but complementary domains, namely graphic design, UI design, and application development. Their collective experience ensures a comprehensive assessment of the application's user interface and usability. During the evaluation, each evaluator identified usability issues within the application and assigned severity ratings to the problems encountered. Severity ratings are used to categorize issues based on their level of impact on the user experience, ranging from minor inconveniences to critical usability flaws. This structured approach helps in prioritizing which issues require immediate attention and resolution. Furthermore, the evaluators' diverse backgrounds and experiences bring a multi-dimensional perspective to the evaluation process. This diversity ensures that the feedback and assessments cover a wide array of usability aspects, enabling a holistic and thorough review of the application. The combination of specialized expertise and varied viewpoints strengthens the reliability and depth of the heuristic evaluation.

Based on the results of the analysis and testing of the user interface and user experience, it was found that the application contains issues with varying levels of priority. While some problems were identified as having low priority, several high-priority issues require immediate attention and resolution. One of the primary concerns raised by users was the organization of menu categories within the BSI Mobile application, which many felt needed to be restructured to enhance accessibility and usability. Additionally, the evaluation revealed that some users were unaware of the full range of features offered by the application, such as the ability to top up e-wallets or perform e-commerce transactions. This indicates a need for better feature discoverability, either through clearer design, improved navigation, or educational resources within the app. Furthermore, some users expressed that the application's design feels outdated and suggested that it should be updated to align with current UI/UX design trends, ensuring a more modern and visually appealing interface. The suggested improvements to the BSI Mobile application, addressing these issues, have already been designed and documented. These proposed changes aim to reorganize the menu structure, enhance the visibility of features, and modernize the design to meet user expectations. The detailed designs for these enhancements can be found in the results of the

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previous testing phase, providing actionable recommendations for improving the overall user experience.

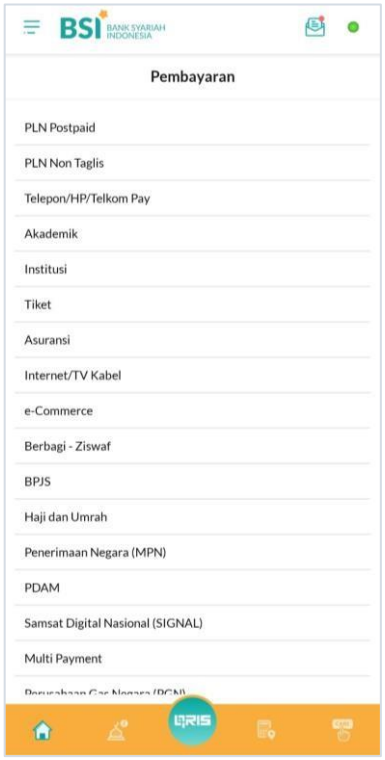


Picture 1. User Interface

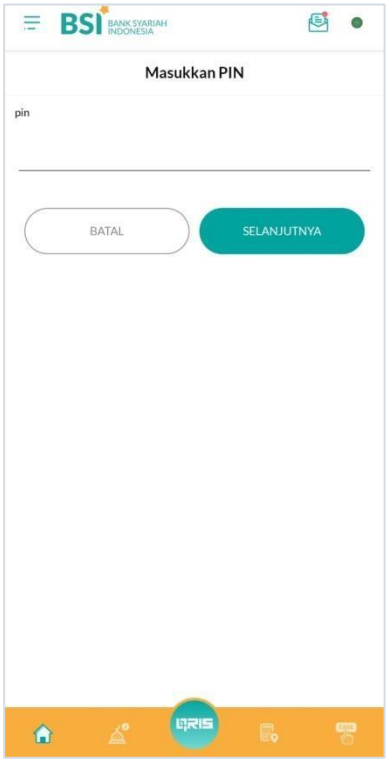
On the initial screen of the BSI Mobile application, there is no requirement for a dedicated login process, such as entering a username and password. The image above also represents the home screen of the BSI Mobile app, which displays various menu categories along with prayer time reminders.

A recommended improvement for the login interface includes enabling users to log in with a username and password, while also offering a fingerprint authentication feature as an alternative option. This would enhance efficiency compared to the current process of entering a password and PIN every time users wish to make a transaction or check their account history. Additionally, a "Forgot Password" feature could be introduced to assist users in recovering their credentials more easily, providing clear guidance on what steps to take in the event they forget their password.

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Picture 2. Current Payment Screen



Picture 3. PIN Input Screen for Each Transaction

In the current payment screen of the BSI Mobile application, the payment menu is accessible via the "Bayar" (Pay) menu. However, the design of this menu could be improved by including visual elements that align with the selected menu options. This would provide a more intuitive user experience, helping customers quickly identify the correct options and complete transactions more efficiently. Currently, conducting a transaction in the payment menu requires two steps: entering a password followed by a PIN for each transaction. While this ensures a high level of security, it is perceived as inefficient and time-consuming for users. Requiring multiple inputs for every transaction interrupts the flow of the process, reducing user satisfaction. For future improvements, it is recommended to streamline the security process by providing adequate protection without the need for repeatedly entering a PIN for each transaction. Potential solutions include implementing a secure single-authentication system or offering alternative authentication methods, such as biometrics (e.g., fingerprint or facial recognition). These changes would significantly enhance transaction efficiency while maintaining robust security standards.

DISCUSSION

The combination of the User Experience Questionnaire (UEQ) and Heuristic Evaluation Testing provides a comprehensive method for assessing mobile banking applications. UEQ focuses on quantitative measurements of user satisfaction across dimensions such as Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation, and Novelty. On the other hand, Heuristic Evaluation emphasizes qualitative feedback by identifying usability issues based on expert evaluations. Empirical studies suggest that integrating these methods allows for a balanced assessment of user experience, combining

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subjective user perceptions with expert insights into usability issues (Suganya & Vetrivel, 2024).

In a mobile banking context, UEQ data often highlights users' satisfaction levels in areas like efficiency and reliability, which are critical for transactional apps (Qatawneh & Makhlouf, 2023). Empirical evidence shows that users highly value efficiency and trust when dealing with sensitive financial data. However, dimensions such as Stimulation and Novelty tend to score lower, reflecting the industry's focus on functionality over creativity (Diwani et al., 2024). The BSI Mobile application, for example, exhibits high scores in Dependability and Efficiency but lower scores in Novelty, as indicated by user feedback.

Heuristic Evaluation Testing complements UEQ by uncovering specific usability problems, particularly in navigation and accessibility. Research indicates that heuristic evaluations are effective for identifying issues related to feature discoverability and workflow efficiency (Talero-Sarmiento et al., 2024). In the case of BSI Mobile, evaluators noted inefficiencies in requiring both a password and PIN for every transaction, echoing findings from UEQ that users found transactional processes cumbersome. Such insights highlight areas where streamlining authentication processes, such as incorporating biometric login, can improve user experience while maintaining security.

The integration of these two approaches has been empirically validated as a best practice in UX research. Studies emphasize that UEQ provides an overview of user satisfaction, while heuristic evaluation dives deeper into specific interface challenges (Chen et al., 2024). By addressing overlapping insights, such as the need for improved transaction flow in BSI Mobile, actionable recommendations can be formulated. These include introducing a more modern interface to enhance Novelty and simplifying authentication to increase Efficiency, aligning with user needs and industry trends. In conclusion, leveraging both UEQ and Heuristic Evaluation Testing enables a data-driven approach to improving mobile banking applications. By using UEQ to quantify user satisfaction and heuristic evaluations to identify usability flaws, mobile banking providers can address user pain points comprehensively. Empirical studies consistently demonstrate that such an integrated approach results in more user-friendly, efficient, and engaging applications, ensuring better alignment with user expectations and competitive positioning in the financial technology landscape.

CONCLUSION

The analysis of the BSI Mobile application using a combination of the User Experience Questionnaire (UEQ) and Heuristic Evaluation Testing highlights both strengths and areas for improvement in its design and functionality. The UEQ results reveal that the application performs well in dimensions like Efficiency and Dependability, indicating that users find the app reliable and effective for completing tasks. However, dimensions such as Novelty and Stimulation score relatively lower, suggesting the need for a more innovative and engaging user experience. The Heuristic Evaluation Testing complements these findings by identifying specific usability issues, such as the inefficient transactional process requiring both a password and PIN, and the lack of feature discoverability.

Based on the research findings, several actionable recommendations can be made. First, the application should streamline its transactional authentication process by incorporating biometric login options (e.g., fingerprint or facial recognition) as an alternative to the password and PIN system. This would enhance both usability and efficiency without

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compromising security. Second, to address the low Novelty score, the interface design should be updated to align with modern UI trends, incorporating visually appealing elements and personalized features that resonate with users. Additionally, improving feature discoverability—such as highlighting functionalities like e-wallet top-ups can significantly improve user engagement and satisfaction. Future research should explore longitudinal studies to assess the impact of proposed improvements on user satisfaction and application performance over time. This could involve comparing pre- and post-implementation data to determine the effectiveness of new design features and authentication methods. Additionally, incorporating user interviews or focus groups could provide deeper qualitative insights into specific user needs and expectations. It would also be valuable to expand the research scope by comparing the BSI Mobile application with competitor mobile banking platforms to identify industry-wide best practices and benchmarks. Finally, future studies could explore the integration of emerging technologies, such as AI-driven personalization and voice-assisted banking, to further enhance user experience and innovation. This holistic approach will not only address current user pain points but also ensure the application remains competitive in an evolving financial technology landscape.

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