The Role of the Expectation Confirmation Model (ECM) Combined with Brand Awareness, Brand Image, Mobile Banking Service Quality, and Visual Appeal in Influencing Continuance Intention Among BTN Mobile Banking (Bale) Users

Yesika Vivy Indria¹, Muchsin Saggaff Shihab² ^{1,2} Master of Management Program, Universitas Bakrie

e-mail: yesikavi@gmail.com

Abstrak

Penelitian ini bertujuan untuk menguji pengaruh langsung dan tidak langsung dari Brand Awareness, Brand Image, Mobile Banking Service Quality, dan Visual Appeal terhadap Continuance Intention dalam penggunaan aplikasi Bale by BTN. Penelitian ini juga mengeksplorasi peran mediasi Confirmation, Perceived Usefulness, dan Satisfaction dalam kerangka Expectation Confirmation Model (ECM). Data dikumpulkan dari 226 pengguna mobile banking BTN melalui kuesioner online dan dianalisis menggunakan pendekatan kuantitatif PLS-SEM melalui SmartPLS 4. Temuan penelitian mengungkapkan bahwa Mobile Banking Service Quality secara signifikan mempengaruhi Continuance Intention baik secara langsung maupun tidak langsung melalui Confirmation dan Satisfaction. Meskipun Visual Appeal tidak secara langsung mempengaruhi Continuance Intention, namun memberikan pengaruh tidak langsung yang signifikan melalui Confirmation, Perceived Usefulness, dan Satisfaction. Sebaliknya, Brand Awareness dan Brand Image tidak menunjukkan pengaruh langsung atau tidak langsung yang signifikan terhadap Continuance Intention. Hasil ini menyoroti pentingnya peningkatan kualitas layanan digital dan desain visual untuk mendorong kepuasan pengguna dan loyalitas jangka panjang dalam aplikasi perbankan seluler.

Kata kunci : Model Konfirmasi Harapan, Niat Berkelanjutan, Mobile Banking, Kualitas Layanan, Daya Tarik Visual, Citra Merek, Kesadaran Merek

Abstract

This study aims to examine the direct and indirect effects of Brand Awareness, Brand Image, Mobile Banking Service Quality, and Visual Appeal on Continuance Intention in the use of Bale by BTN application. It also explores the mediating roles of Confirmation, Perceived Usefulness, and Satisfaction within the framework of the Expectation Confirmation Model (ECM). Data were collected from 226 users of BTN mobile banking through an online questionnaire and analyzed using the PLS-SEM quantitative approach via SmartPLS 4. The findings reveal that Mobile Banking Service Quality significantly affects Continuance Intention both directly and indirectly through Confirmation and Satisfaction. Although Visual Appeal does not directly influence Continuance Intention, it exerts a significant indirect effect via Confirmation, Perceived Usefulness, and Satisfaction. Conversely, Brand Awareness and Brand Image do not show any significant direct or indirect influence on Continuance Intention. These results highlight the importance of enhancing digital service quality and visual design to foster user satisfaction and long-term loyalty in mobile banking applications.

Keywords : Expectation Confirmation Model, Continuance Intention, Mobile Banking, Service Quality, Visual Appeal, Brand Image, Brand Awareness

INTRODUCTION

Digital transformation has reshaped the banking industry, particularly through the widespread adoption of *mobile banking*. This innovation not only enhances transactional efficiency

but also revolutionizes how consumers interact with banks. In Indonesia, Himbara banks dominate the mobile banking user market, reflecting their strong national reach among digital consumers.

The usage dynamics of *mobile banking* within Himbara banks reveal an interesting phenomenon. BTN records the lowest number of users—around 2.7 million—but ranks third in transaction volume with 415 million transactions, surpassing BNI, which has a larger user base. The largest contribution to BTN's transaction volume comes from customers in the Jakarta Regional Office 1, covering areas such as Bintaro, Kelapa Gading, and BSD, making it the primary driver of BTN's digital activity nationwide.

In 2024, BTN Jakarta Regional Office 1 also became the top contributor to BTN's *mobile banking* user count, with a significant increase from 276,859 to 1,366,156 active users. This surge was driven by the migration to the new platform, "Bale by BTN." However, despite the sharp increase in active users, new user acquisition slightly declined—from 157,757 in 2023 to 154,529 in 2024 (Bank Tabungan Negara, 2025). The stagnation in new user acquisition compared to the growth of existing users raises questions about how experience and perception influence users' continuance intention. To explain this, the *Expectation Confirmation Model* (Bhattacherjee, 2001) is employed as the theoretical framework, emphasizing post-usage evaluation. When user expectations are met, it strengthens *perceived usefulness* and *satisfaction*, which in turn drives *continuance intention* toward BTN's digital services.

The sustainability of *mobile banking* usage is influenced not only by internal factors within the ECM but also by external factors such as brand perception and service quality. *Brand awareness* plays an essential role in building users' initial connection with the service and influencing long-term usage intentions, not only during the early adoption stage but also in maintaining ongoing engagement (Sasmita & Suki, 2015; Tam et al., 2022).

Furthermore, *brand image* contributes to shaping consumer perceptions regarding the quality and credibility of the services offered. A strong brand image instills positive associations in users' minds, reflecting the values, professionalism, and reliability of the banking institution (Sasmita & Suki, 2015). Previous studies have shown that a positive brand image significantly influences users' perceived usefulness and loyalty toward digital services (Tam et al., 2022).

In application-based digital services, *mobile banking service quality* becomes a key determinant of the user experience. This includes response speed, system reliability, data security, and interface usability. Pokhrel et al. (2024) argue that perceptions of digital service quality are largely shaped by users' direct interaction with the system. When service quality meets or exceeds expectations, it enhances satisfaction and fosters long-term user loyalty. Another critical aspect is the *visual appeal* of the mobile banking application's interface. Aesthetic elements such as graphic design, layout, color scheme, and readability contribute to creating a pleasant and professional user experience. Optimal visual appeal fosters a positive first impression, reinforces credibility perceptions, and enhances users' comfort in repeated usage (Tam et al., 2022).

This study adopts the conceptual model developed by Tam et al. (2022), which originally examined *continuance intention* in the context of low-cost airline e-ticketing. An adjustment was made by replacing the *website quality* variable with *mobile banking service quality* to better suit the context of the digital banking industry. The novelty of this study lies in the integration of the *Expectation Confirmation Model (ECM)* with strategic elements from brand and mobile service quality perspectives, examined empirically among users of the "Bale by BTN" application at BTN Jakarta Regional Office 1. Based on this framework, the study aims to investigate the direct and indirect effects of *brand awareness, brand image, mobile banking service quality*, and *visual appeal* on *continuance intention*, with *confirmation, perceived usefulness*, and *satisfaction* serving as mediating variables. The findings are expected to provide theoretical contributions to the development of information system sustainability models and offer practical insights for banks in formulating strategies to enhance digital service user retention.

To systematically illustrate the relationships among variables in this study, a conceptual framework was developed to visualize the flow of influence between exogenous, endogenous, and mediating constructs based on relevant theories and prior findings. This framework serves as the foundation for formulating the empirical model, which will be tested using a quantitative approach, as depicted below:



Figure 1. Conceptual Framework

Based on the conceptual framework presented in Figure 1, the following hypotheses are formulated to examine the relationships among the variables in this study model:

H1: Confirmation has a positive effect on Perceived Usefulness

H2: Perceived Usefulness has a positive effect on Continuance Intention

H3: Perceived Usefulness has a positive effect on Satisfaction

H4: Confirmation has a positive effect on Satisfaction

H5: Satisfaction has a positive effect on Continuance Intention

H6a: Brand Awareness has a positive effect on Confirmation

H6b: Brand Awareness has a positive effect on Continuance Intention

H7a: Brand Image has a positive effect on Confirmation

H7b: Brand Image has a positive effect on Continuance Intention

H8a: Mobile Banking Service Quality has a positive effect on Confirmation

H8b: Mobile Banking Service Quality has a positive effect on Continuance Intention

H9a: Visual Appeal has a positive effect on Confirmation

H9b: Visual Appeal has a positive effect on Continuance Intention

H10: Brand Awareness, Brand Image, Mobile Banking Service Quality, and Visual Appeal have indirect effects on Continuance Intention through Confirmation, Perceived Usefulness, and Satisfaction as mediating variables.

METHOD

This study employed a quantitative research approach to examine the effects of brand awareness, brand image, mobile banking service quality, and visual appeal on continuance intention, with confirmation, perceived usefulness, and satisfaction as mediating variables. Data were collected using an online questionnaire distributed via WhatsApp and social media platforms through Google Forms. The instrument used was a closed-ended questionnaire utilizing a 7-point semantic differential scale.

Primary data were obtained from active customers of Bank BTN who use the "Bale by BTN" mobile banking service within the Jakarta Region 1 Office. Respondents were selected using a purposive sampling technique based on the following criteria: (1) having actively used BTN's mobile banking service for at least the past three months, and (2) being registered customers of Jakarta Region 1.

Prior to the main data collection, a pilot test was conducted on 30 respondents to assess the validity and reliability of the instrument. Referring to Hair et al. (2017), the minimum sample

size was determined to be 5–10 times the number of indicators, yielding a requirement of at least 205 respondents for 41 items. Out of 240 responses collected, 226 were deemed valid and included in the analysis, meeting the minimum threshold for PLS-SEM analysis.

RESULTS AND DISCUSSION

This study analyzed the relationships among variables using the Structural Equation Modeling–Partial Least Squares (SEM-PLS) approach, assisted by SmartPLS 4 software. The analysis was carried out in two main stages: the evaluation of the measurement model (outer model) and the structural model (inner model) assessment.

Measurement Model Evaluation (Outer Model)

The outer model evaluation was conducted to assess the validity and reliability of the indicators in relation to their respective constructs. All outer loading values ranged between 0.71 and 0.90, indicating strong indicator contributions and meeting the convergent validity threshold as recommended by Hair et al. (2017), with a minimum acceptable value of 0.70. To further support the reliability and construct validity analysis, the values of AVE and Cronbach's Alpha are presented in Table 1 below.

| Table 1. Average Variance Extracted and Cronbach's Alpha | | |
|--|-------------------------------------|------------------|
| | Average Variance Extracted (AVE) | Cronbach's Alpha |
| Brand Awareness | 0.70 | 0.867 |
| Brand Image | 0.67 | 0.844 |
| Mobile Banking Service Quality | 0.61 | 0.922 |
| Visual Appeal | 0.71 | 0.866 |
| Perceived Usefulness | 0.66 | 0.829 |
| Confirmation | 0.78 | 0.866 |
| Satisfaction | 0.65 | 0.738 |
| Continuance Intention | 0.63 | 0.711 |

Table 1 shows that all variables have AVE values ranging from 0.61 to 0.78 and Cronbach's alpha values between 0.711 and 0.922, meeting the criteria for convergent validity and internal reliability (Hair et al., 2017). Discriminant validity is also fulfilled, as indicated by the square root of each AVE being greater than the correlations between constructs and all HTMT values being below 0.90.

In addition, the multicollinearity test results show that all variance inflation factor (VIF) values are below 5, indicating no high correlation among independent constructs, thus confirming that the model is suitable for structural testing.

Goodness of Fit

Subsequently, the model fit was evaluated using the Standardized Root Mean Square Residual (SRMR) and the Normed Fit Index (NFI). The results indicated an SRMR value of 0.083, which, although slightly above the ideal threshold of < 0.08, remains within an acceptable range for model fit under the PLS-SEM approach (Henseler et al., 2014). Meanwhile, the NFI value of 0.795 approaches the recommended threshold of 0.90, which is considered adequate (Hair et al., 2017). Therefore, the model can be regarded as having achieved acceptable fit according to PLS-SEM evaluation criteria.

Structural Model Assessment (Inner Model)

To evaluate the model's ability to explain the dependent variables, the coefficient of determination (R-square or R²) is used as an indicator. The R² value indicates the proportion of variance in the endogenous variables that can be explained by the exogenous variables within the research model. The R-square values for each dependent variable are presented in Table 2 below.

| Table 2. <i>R Square</i> | | | |
|--------------------------|----------|-------------------|--|
| Variabel | R-square | R-square adjusted | |
| Confirmation | 0.728 | 0.723 | |
| Continuance Intention | 0.808 | 0.803 | |
| Perceived Usefulness | 0.650 | 0.648 | |
| Satisfaction | 0.805 | 0.803 | |

Table 2 presents the results of the R-square analysis, indicating that the model demonstrates strong predictive power for the endogenous variables. The highest R-square value is observed for the *Continuance Intention* variable at 0.808, followed by *Satisfaction* at 0.805, suggesting that over 80% of the variance in these two variables can be explained by the independent variables in the model. Meanwhile, the *Confirmation* and *Perceived Usefulness* variables show R-square values of 0.728 and 0.650, respectively, reflecting moderate to high explanatory power, as classified by Hair et al. (2017). The adjusted R-square values for all variables are very close to their respective R-square values, indicating no signs of overfitting and confirming the stability of the model even after accounting for the number of predictors in the structural framework. A visual representation of the relationships among variables in this study is presented in Figure 2 below.



Figure 2. PLS-SEM Algorithm Output Model

Figure 2 illustrates the PLS-SEM model output, where the values on the arrows represent the magnitude of influence between variables, and the numbers within the blue circles indicate the R-square values. *Confirmation* exerts a strong influence on *Perceived Usefulness* (0.806) and *Satisfaction* (0.650). *Satisfaction* emerges as the primary predictor of *Continuance Intention* (0.516), with the highest R-square value observed in *Continuance Intention* (0.808), indicating that the majority of users' intention to continue using mobile banking can be explained by this model. *Direct Effect Testing Results*

Path coefficient analysis was conducted using the bootstrapping technique in SmartPLS to assess the significance of the relationships between variables. The results of the structural model

analysis (SEM-PLS) revealed both significant and non-significant relationships among the constructs.

First, *confirmation* was found to have a highly significant positive effect on *perceived* usefulness (β = 0.806; t = 22.661; p < 0.001) and *satisfaction* (β = 0.650; t = 5.908; p < 0.001), supporting hypotheses H1 and H4. Additionally, *perceived usefulness* significantly influenced satisfaction (β = 0.287; t = 2.397; p = 0.008), confirming hypothesis H3.

However, the direct effect of *perceived usefulness* on *continuance intention* was not statistically significant (β = 0.065; t = 0.597; p = 0.275), leading to the rejection of H2. Conversely, *satisfaction* exhibited a significant and positive influence on *continuance intention* (β = 0.516; t = 5.778; p < 0.001), thereby supporting hypothesis H5.

In the assessment of external factors, *brand awareness* did not exhibit a significant influence on either *confirmation* ($\beta = 0.013$; t = 0.310; p = 0.378) or *continuance intention* ($\beta = 0.053$; t = 1.289; p = 0.099), leading to the rejection of hypotheses H6a and H6b. Similarly, *brand image* showed no significant effect on *confirmation* ($\beta = -0.041$; t = 0.403; p = 0.343) or *continuance intention* ($\beta = -0.078$; t = 0.873; p = 0.191), resulting in the rejection of H7a and H7b.

Conversely, *mobile banking service quality* had a significant effect on both *confirmation* (β = 0.544; t = 4.433; p < 0.001) and *continuance intention* (β = 0.425; t = 3.726; p < 0.001), supporting hypotheses H8a and H8b. Furthermore, *visual appeal* significantly influenced *confirmation* (β = 0.366; t = 3.027; p = 0.001), although its effect on *continuance intention* was not significant (β = -0.037; t = 0.330; p = 0.371), thus accepting H9a and rejecting H9b.

Indirect Effect Testing Results

The bootstrapping results for indirect effects reveal several significant mediation pathways. First, *confirmation* indirectly influences *satisfaction* through *perceived usefulness* ($\beta = 0.231$; t = 2.229; p = 0.013), and also affects *continuance intention* via the sequential path *perceived usefulness* \rightarrow *satisfaction* ($\beta = 0.119$; t = 2.934; p = 0.002) and through *satisfaction* alone ($\beta = 0.336$; t = 3.496; p < 0.001). In addition, *perceived usefulness* exerts a significant indirect influence on *continuance intention* ($\beta = 0.148$; t = 3.084; p = 0.001).

Regarding the external variable, *mobile banking service quality* shows significant indirect effects on *continuance intention* through multiple pathways: via *perceived usefulness* \rightarrow *satisfaction* ($\beta = 0.065$; t = 3.237; p = 0.001), through the sequential route *confirmation* \rightarrow *perceived usefulness* \rightarrow *satisfaction* ($\beta = 0.126$; t = 2.667; p = 0.004), and through *confirmation* \rightarrow *satisfaction* ($\beta = 0.183$; t = 2.400; p = 0.008). The direct indirect path *MBSQ* \rightarrow *confirmation* \rightarrow *perceived usefulness* is also significant ($\beta = 0.438$; t = 4.729; p < 0.001), as is the path *confirmation* \rightarrow *satisfaction* ($\beta = 0.353$; t = 3.011; p = 0.001).

Visual appeal also exerts a significant indirect effect on *continuance intention* through multiple mediation pathways. Notably, it influences *continuance intention* via *confirmation* \rightarrow *satisfaction* ($\beta = 0.123$; t = 2.373; p = 0.009) and the sequential path *confirmation* \rightarrow *perceived usefulness* \rightarrow *satisfaction* \rightarrow *continuance intention* ($\beta = 0.044$; t = 1.861; p = 0.031). Additionally, the paths visual appeal \rightarrow confirmation \rightarrow *perceived usefulness* ($\beta = 0.295$; t = 2.897; p = 0.002) and visual appeal \rightarrow *confirmation* \rightarrow *satisfaction* ($\beta = 0.238$; t = 2.888; p = 0.002) are also significant.

Conversely, no significant indirect effects were found for *brand awareness* or *brand image* on *continuance intention* across the tested mediation paths (all p > 0.05). These results suggest that brand perception alone is insufficient to drive users' continuance intention without the support of a positive usage experience.

Discussion

The findings of this study enrich the understanding of the factors that shape continuance intention in the use of mobile banking, particularly within the digital service context of Bank BTN. Results from the direct effect analysis highlight *confirmation* as a key determinant in shaping both *perceived usefulness* and *user satisfaction*. When the services delivered align with initial expectations, users experience not only emotional satisfaction but also develop a belief in the

application's functional benefits. This aligns with the *Expectation Confirmation Model (ECM)*, which emphasizes post-use evaluation as a critical predictor of continued system use.

However, the absence of a significant direct relationship between perceived usefulness and continuance intention suggests that rational assessments of technology benefits alone are insufficient to ensure sustained use. In this case, *satisfaction* emerges as a crucial mediating factor, bridging the gap between cognition and behavior. In other words, while users may acknowledge the utility of the application, their decision to continue using it is more strongly influenced by the satisfaction derived from the user experience. These findings underscore satisfaction as a more powerful psychological outcome than perceived usefulness alone.

The analysis of external variables reveals a compelling dynamic. Although *brand awareness* and *brand image* are theoretically important for fostering emotional connections with users, they did not demonstrate significant direct or mediated effects in this study. This suggests that in the context of digital banking, brand perception alone is insufficient to drive user loyalty without the support of a strong usage experience. The findings indicate a shift from symbolic orientation to functional orientation, wherein actual user experience takes precedence over brand associations in influencing continued usage.

This result contrasts with the findings of Tam et al. (2022), which revealed that brand awareness and brand image significantly influenced continuance intention in the context of *low-cost carrier* (LCC) airline websites. The discrepancy may stem from the differing research contexts; while Tam's study involved a market with stronger brand awareness and greater homogeneity in digital services, the present study focuses on mobile banking users of BTN, where brand strength may not yet be sufficiently established to influence continuance intention. In such markets, service quality and user experience emerge as more dominant factors than symbolic brand value.

Conversely, *mobile banking service quality* exhibited a significant influence on continuance intention, both directly and indirectly through *confirmation*, *perceived usefulness*, and *satisfaction*. These results are consistent with Pokhrel (2024), who emphasized that service quality dimensions—such as efficiency, system reliability, data privacy, and service fulfillment—play a critical role in fostering user satisfaction and loyalty. Both studies affirm that service quality forms the foundation for shaping positive perceptions and sustaining long-term user relationships in digital platforms.

Similarly, *visual appeal* has been shown to exert an indirect effect on *continuance intention* through multiple mediating pathways. An engaging and intuitive interface design not only creates an aesthetically positive impression but also reinforces users' confidence that the system functions as expected. Although visual appeal does not have a direct impact on continuance intention, its influence on *satisfaction* and *perceived usefulness* contributes meaningfully to users' decisions to continue using the application.

Overall, these findings affirm that *continuance intention* is not a product of a single direct influence but rather the outcome of a complex and integrated psychological process. This process involves the interplay between initial expectations, actual usage experience, perceived benefits, and emotional satisfaction. Accordingly, this study not only supports the theoretical foundation of the *Expectation Confirmation Model (ECM)* but also extends it by demonstrating that the integration of internal and external factors—as well as rational and emotional aspects—is essential in explaining user loyalty in the context of digital banking services.

Limitations and Future Research Directions

This study is limited by its geographic scope, focusing solely on users of BTN mobile banking in the Jakarta 1 region, which restricts the generalizability of the findings to the broader population. Furthermore, the model examined only selected variables within the extended Expectation Confirmation Model (ECM) framework. Future research is encouraged to expand the geographic coverage, adopt a longitudinal approach, and incorporate additional variables such as *trust, convenience*, or *user experience*. Qualitative methods could also be employed to gain deeper insights into users' perceptions and motivations for continued use of mobile banking services.

CONCLUSION

This study concludes that *continuance intention* in using BTN's mobile banking is shaped through a psychological process involving *confirmation*, *perceived usefulness*, and *satisfaction*. *Satisfaction* emerges as the key factor bridging perceived usefulness and user loyalty. In contrast, brand strength shows no significant influence, indicating that actual user experience outweighs symbolic brand image. Conversely, *service quality* and *visual appeal* contribute meaningfully through mediated pathways. These findings extend the Expectation Confirmation Model (ECM) by emphasizing the importance of integrating functional, emotional, and perceptual dimensions in explaining user loyalty within the digital banking context.

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