International Journal of Mobile Applications and Technologies (ISSN: 2944-5671)
an Open Access journal by Wohllebe & Ross Publishing, Germany.
Volume: 01 Issue: 02 Year: 2025
https://doi.org/10.51137/wrp.ijmat.2025.cgut.45846

User Engagement in Mobile Banking Apps: A Literature Review of Drivers and Consequences

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Abstract:

This literature review examines user engagement in mobile banking apps, a vital aspect for customer satisfaction and loyalty. The authors synthesize research from scientific journals (Q4 Scimago or higher) published since 2015. The review details the theoretical frameworks (S-O-R, UTAUT) and methodological approaches (quantitative surveys) employed. It clarifies the meaning and measurement of user engagement (interactivity, usage frequency, tailored indices) within this context. In addition, the authors identify key drivers like convenience, trust, and the "servicescape" and analyze the role of push notifications in boosting engagement when optimally managed. Finally, the paper highlights the significant consequences of engagement for customers (satisfaction, loyalty) and banks (stronger relationships). Future research could explore the impact of AI-powered financial advice features on user engagement or investigate the long-term effects of gamification elements within banking apps. This synthesis offers a concise overview of current research, pinpointing gaps and future directions.

Keywords:

Mobile Applications, Digital Finance, Mobile Banking Apps, User Engagement, User Behaviour.

Submitted: 2025-05-14. Revised: 2025-06-18. Accepted: 2025-07-03.

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Introduction

In addition to fundamental market distortions, banks face major digital challenges in continuing to meet customer requirements and remain competitive. For this reason, banks are investing heavily in networking their sales channels to create an omni-channel system. One of the sales channels in this groundbreaking approach is the use of mobile banking apps (Menrad, 2020). The pervasive adoption of smartphones has fundamentally reshaped consumer behaviour, extending to the realm of financial services. Mobile banking apps have emerged as a cornerstone of modern finance, offering unparalleled convenience and accessibility for a myriad of banking services (Alavi & Ahuja, 2016; Zhang et al., 2018). The initial embrace of these digital platforms has been significantly influenced by factors such as perceived usefulness, ease of use, trust, and security (Majumdar & Pujari, 2021; Zhang et al., 2018). Furthermore, the overall consumer experience with mobile banking apps is considerably enhanced by factors like convenience, trust, and social influence (Shahid et al., 2022). Trustworthiness, encompassing ability, benevolence, and integrity, has been identified as a critical determinant positively impacting app usage (Khan et al., 2021). However, the rapid proliferation of these apps is not without its challenges, as concerns persist regarding privacy and the potential for extended bank surveillance (Tiessen, 2015). Research has also highlighted diverse user segments based on technology adoption levels, with demographics playing a discernible role in usage patterns (Chawla & Joshi, 2017). Despite the myriad benefits and ongoing innovations, global adoption rates for mobile banking apps, while growing, still present opportunities for financial institutions to refine their mobile offerings and marketing strategies (Souiden et al., 2020).

In this dynamic landscape, understanding and fostering user engagement in mobile banking apps is paramount for banks to enhance customer satisfaction, drive loyalty, and ultimately achieve business objectives. While initial adoption focuses on gaining users, sustained success hinges on keeping them actively involved and continuously interacting with the application. This literature review aims to systematically explore the multifaceted concept of user engagement within mobile banking apps.

This paper will address the following key research questions:

1. Which theoretical frameworks and methodological approaches are employed in the research of user engagement within mobile banking apps?
2. What constitutes user engagement in mobile banking apps specifically, and how is it typically measured in academic and industry contexts?
3. What are the key drivers and antecedents that influence user engagement in mobile banking applications?
4. What is the specific role of push notifications in driving user engagement in mobile banking apps?

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5. What are the discernible consequences and outcomes of user engagement in mobile banking apps for both users and financial institutions?

By addressing these questions, this review seeks to provide a comprehensive overview of the current state of research on user engagement in mobile banking apps, identify existing gaps, and offer directions for future scholarly inquiry.

Methods and Data

This literature review systematically synthesizes existing research on user engagement in mobile banking apps. To ensure the quality and relevance of the included studies, a rigorous selection process was employed. The review focused exclusively on academic publications since 2015 that are ranked at least Q4 according to the Scimago Journal & Country Rank. This criterion ensures that the included literature has undergone a robust peer-review process and meets a recognized standard of academic rigor.

Data Collection

The search for relevant literature was conducted across major academic databases, including but not limited to, Scopus, Web of Science, and AIS eLibrary. A comprehensive set of keywords was utilized, encompassing terms related to mobile banking, user engagement, customer behaviour, and financial technology. These keywords included "mobile banking engagement," "m-banking user behaviour," "fintech adoption," "customer interaction mobile finance," "app usage banking," "push notifications banking," and combinations thereof. The initial search yielded a broad collection of articles, which were then systematically screened based on their titles and abstracts to ascertain their direct relevance to user engagement in mobile banking apps.

Data Analysis

Following the initial screening, full texts of potentially relevant articles were retrieved and subjected to a more in-depth review. This stage focused on identifying studies that directly addressed the defined research questions of this paper: theoretical frameworks, measurement of engagement, drivers and antecedents, the role of push notifications, and consequences of engagement. Data extraction involved summarizing key findings from each selected paper, noting the methodologies employed, the specific aspects of user engagement explored, and the reported outcomes. A thematic analysis approach was then applied to synthesize the extracted data, allowing for the identification of recurring themes, emerging trends, and areas requiring further investigation within the literature on user engagement in mobile banking apps.

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Results and Discussion

Theoretical Frameworks and Methodological Approaches to Research User Engagement in Mobile Banking Apps

To understand user engagement, researchers commonly draw upon several theoretical models:

- The stimulus-organism-response (S-O-R) framework helps examine how the mobile banking "servicescape" (the environment where the service is delivered) impacts customer attitudes and engagement (Sahoo & S. Pillai, 2017).
- The Unified Theory of Acceptance and Use of Technology (UTAUT) model is frequently applied, often enhanced with additional elements like perceived credibility and convenience, to investigate the adoption of mobile banking (Bhatiasevi, 2016).
- Some studies combine multiple models for a richer understanding. For example, the UTAUT model might be integrated with the Information Systems (IS) Success model (Albashrawi & Motiwalla, 2019), or Tan's failure model might be combined with DeLone and McLean's Information Success model (Kamboj et al., 2021).

In terms of methodology, researchers employ a mix of quantitative and qualitative techniques:

- Quantitative methods are prevalent, with researchers often using online surveys and structural equation modeling (SEM) to analyze data (Tak & Gupta, 2021; Zhang et al., 2018).
- Qualitative methods, such as focus group discussions, are also used to identify key attributes of mobile banking apps (Tak & Gupta, 2021).

These diverse approaches enable researchers to gain insights into the factors influencing user engagement, adoption, and sustained use of mobile banking applications.

User Engagement and Its Measurement in Mobile Banking Apps

In mobile banking apps, user engagement is a rich concept that includes interactivity, social presence, and brand experience (Garzaro et al., 2020). It refers to how users interact with and commit to the app.

User engagement in mobile banking apps is quantified through several metrics:

- App usage frequency and longevity of use are common indicators (Rahman et al., 2017; Spaulding et al., 2021).
- Self-monitoring activities within the app also serve as a measurement (Rahman et al., 2017; Spaulding et al., 2021).
- Beyond these direct usage metrics, engagement indices can be tailored to specific apps to precisely quantify user interactions (White et al., 2022).

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- The User Engagement Scale, originally adapted for mobile health apps, offers a framework for measurement by identifying four key attributes: perceived usability, aesthetic appeal, reward, and focused attention (Holdener et al., 2020).

Factors like personalization, goal-setting features, multimedia content, and social connectivity can influence engagement levels (Simões de Almeida & Marques, 2023). While higher engagement generally links to better outcomes (Spaulding et al., 2021), negative experiences like mobile banking failures can reduce usage and customer engagement (Kamboj et al., 2021). Furthermore, the mobile banking "servicescape" significantly influences customer attitudes and engagement (Sahoo & S. Pillai, 2017).

Drivers and Antecedents of User Engagement in Mobile Banking Apps

User engagement in mobile banking apps is influenced by a range of drivers and antecedents, spanning consumer perceptions, app characteristics, and service quality.

- Convenience, Trust, and Social Influence: These factors are crucial as they enhance the overall consumer experience, leading to greater engagement (Shahid et al., 2022).
- Interactivity and Social Presence: Within the app itself, the level of interactivity and the sense of social presence positively contribute to brand engagement (Garzaro et al., 2020).
- Satisfaction, Trust, and Expectancy Confirmation: For users to continue using mobile banking apps, their satisfaction with the service, their trust in the provider, and the confirmation of their initial expectations are paramount drivers of continuance intention (Poromatikul et al., 2019).
- Mobile Banking Servicescape: The design and environmental qualities of the mobile banking interface, referred to as the servicescape, are strong predictors of both customer attitudes and their resulting engagement (Sahoo & S. Pillai, 2017).
- Service Quality, Information Quality, System Quality, Perceived Risk, and Trust: These elements significantly affect customer satisfaction, which in turn influences their intention to continue using the app. Specifically, service quality, perceived risk, and trust are highlighted as key drivers of mobile banking continuance intention (Saibaba, 2023).
- Consumer Empowerment, Subjective Norms, Performance Expectancy, and Effort Expectancy: These factors play a role in shaping the affective (emotional) component of user engagement (Glavee-Geo et al., 2019).
- Perceived Usefulness, Technological Advances, and Increased Access to Mobile Devices: These are fundamental drivers for the initial adoption of mobile banking services (Nisar & Prabhakar, 2017).

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- Convenience, Security, Convergence, Economy, User Familiarity, and Innovativeness: These elements are also crucial for influencing users' continued use of mobile banking apps (Kim et al., 2015).

Role of Push Notifications Driving User Engagement in Mobile Banking Apps

Push notifications are a significant tool for boosting user engagement in mobile banking apps. When used thoughtfully, they can increase how often users interact with the app and how many sessions they complete (Pham et al., 2016). However, there's a fine line: sending too many can make them less effective (Fraser & Conlan, 2020; Pham et al., 2016; Wohllebe, 2020; Wohllebe et al., 2021).

How Push Notifications Drive Engagement

Push notifications contribute to engagement in several ways:

- As part of the overall mobile banking servicescape, they directly influence customer attitudes and engagement (Sahoo & S. Pillai, 2017). This indicates they play a role in shaping the user's perception of the service environment.
- By fostering positive user experiences, push notifications can indirectly support key drivers of continued use, such as satisfaction, trust, and expectancy confirmation (Poromatikul et al., 2019). When users receive timely and relevant notifications, it can enhance their satisfaction and build trust, encouraging them to keep using the app.

Optimizing Push Notifications

To maximize their impact and avoid overuse, strategies for optimizing push notifications include:

- Employing machine learning-based frameworks to rank the relevance of notifications for individual users and analyze their causal impact on engagement (Pinto et al., 2023). This AI-based approach helps ensure notifications are personalized and effective.
- Utilizing state transition models to evaluate notification effectiveness and determine optimal delivery times (Yuan et al., 2019). This data-driven approach helps fine-tune when and how notifications are sent.

Consequences of User Engagement in Mobile Banking Apps

User engagement in mobile banking apps carries substantial consequences, impacting both customers and the financial institutions themselves.

Consequences for Customers

Engaged users generally exhibit more positive behaviours and perceptions:

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- Increased Satisfaction, Trust, Loyalty, and Positive Word-of-Mouth: When users are engaged with their mobile banking apps, it often translates into higher satisfaction levels, stronger trust in the bank, increased loyalty, and a greater likelihood of recommending the service to others (Al-Dmour et al., 2019; Sampaio et al., 2017).
- Higher App Usage and Retention: Engagement fosters continued use of the app, meaning users log in more frequently and are less likely to abandon the service (Kamboj et al., 2021).
- Improved Outcomes: While not explicitly detailed as outcomes of engagement in this specific text, the idea that engagement leads to desirable user behaviours is implied. For instance, the text mentions factors like system, information, and service quality (Ali et al., 2021) and perceived benefits (Garzaro et al., 2020) as drivers of engagement, suggesting that when these drivers are met, positive outcomes for the customer follow.

Consequences for Banks

For financial institutions, fostering user engagement yields several strategic benefits regarding customer experience, satisfaction, and loyalty. By integrating interactive elements and fostering a sense of social presence within their digital banking channels, banks can significantly improve the overall customer experience, leading directly to increased satisfaction and loyalty (Garzaro et al., 2020; Glavee-Geo et al., 2019). This translates into stronger customer relationships and a more stable customer base.

Influencing Factors & Potential Setbacks

It's important to note that while engagement has many positive consequences, several factors influence its levels and potential negative outcomes:

- The mobile banking servicescape, which includes the app's overall design and user experience, strongly influences customer attitudes, which in turn affect their level of engagement (Sahoo & S. Pillai, 2017).
- However, service failures within the mobile banking app can negatively impact user behaviour and satisfaction, potentially undoing the positive consequences of engagement (Kamboj et al., 2021).
- Cultural factors, such as uncertainty avoidance, can also moderate the relationships between engagement and its consequences (Sampaio et al., 2017), suggesting that the impact of engagement might vary across different user demographics or regions.

Conclusion

Mobile banking apps have revolutionized how consumers interact with financial services, offering convenience and accessibility that were once unimaginable. This literature review aimed to synthesize

current research on user engagement in mobile banking apps, addressing key questions regarding theoretical frameworks, measurement, drivers, the role of push notifications, and consequences. The systematic review of publications since 2015, focusing on those ranked at least Q4 by Scimago, provides a comprehensive overview of the scholarly landscape.

The review reveals that research on user engagement in mobile banking predominantly employs established theoretical models like the S-O-R framework and the UTAUT model, often integrated with other frameworks like the IS Success model to provide a richer understanding. Methodologically, quantitative approaches, particularly online surveys and structural equation modeling (SEM), are prevalent, though qualitative methods like focus group discussions also contribute to a holistic view.

Defining and measuring user engagement remains a nuanced task. This review highlights that engagement encompasses interactivity, social presence, and brand experience, and is typically measured through metrics such as app usage frequency, longevity of use, self-monitoring activities, and tailored engagement indices. The User Engagement Scale also offers a valuable framework, emphasizing perceived usability, aesthetic appeal, reward, and focused attention.

A broad array of factors drives user engagement in mobile banking apps. Convenience, trust, social influence, interactivity, social presence, satisfaction, and expectancy confirmation emerge as crucial antecedents. Furthermore, the mobile banking "servicescape" service quality, information quality, system quality, perceived risk, and consumer empowerment significantly shape user engagement.

The present review specifically highlighted the critical role of push notifications in driving engagement. When optimized for relevance and timing, these notifications can substantially increase app interactions and session completions. However, the literature also emphasizes the delicate balance required, as overuse can diminish their effectiveness, underscoring the importance of machine learning-based frameworks and state transition models for optimization.

Finally, the consequences of user engagement are substantial for both customers and banks. For customers, higher engagement leads to increased satisfaction, trust, loyalty, positive word-of-mouth, and sustained app usage. For financial institutions, fostering engagement translates into enhanced customer experience, stronger customer relationships, and a more stable customer base. However, it's crucial to acknowledge that factors like service failures and even cultural differences can moderate these positive outcomes, highlighting the need for continuous improvement and tailored strategies.

Limitations and Future Research

While this review provides a robust synthesis of the literature, it's not without limitations. The authors focus on publications since 2015 and a minimum Scimago Q4 ranking, while ensuring quality, might have excluded some relevant insights from earlier works or journals with lower rankings. Furthermore,

the diverse definitions and measurements of user engagement across studies present a challenge for direct comparability. Some statements refer to specific countries or markets and may not be directly transferable to all banks without further evidence. Furthermore, the study of mobile banking apps is a highly dynamic field. Technologies, regulatory frameworks and customer needs are changing rapidly, which limits the relevance of scientific literature and makes ongoing research essential.

Future research could therefore benefit from more longitudinal studies to better understand the evolution of user engagement over time. There's also a need for more research into the impact of emerging technologies (e.g., AI-powered chatbots, augmented reality features) on user engagement in mobile banking. Investigating the specific drivers and consequences of engagement across different demographics and cultural contexts could also offer valuable insights for global financial institutions. Lastly, exploring the interplay between various engagement drivers and how they collectively contribute to sustained user engagement would be a valuable avenue for further investigation.

Acknowledgement

Dr. Carsten Giebe is a member of the editorial board of the International Journal of Mobile Applications and Technologies. Prof. Dr. Atilla Wohllebe is the editor-in-chief of the International Journal of Mobile Applications and Technologies. PhD Candidate Marcel Guhl is an aspiring scientist whose field of research is the transformation of the banking and finance sector, which is scientific relevant given the various influences currently at play. In accordance with the journal's guidelines, the paper was regularly assessed in a double-blind peer-review process.

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