International Journal of Innovation and Business Strategy

Full paper

DOI: https://doi.org/10.11113/ijibs.v20.181

THE IMPACT OF USER INTERFACE AESTHETICS ON CONSUMER MOTIVATION IN ADOPTING MOBILE BANKING APPLICATIONS: A REVIEW

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Article history: Received: 23 April 2025 Revised: 25 May 2025 Accepted: 03 June 2025 Published: 30 June 2025

Article type: Review article

Abstract

This review article aims to discuss the roles of user interface aesthetics and consumer motivation in m-banking applications. It draws on secondary data to illuminate the impact of design components such as colorfulness, typography, layouts, dark modes, symbolism, and icons on users' involvement and motivation. Core theoretical models and empirical findings are examined to understand the role of aesthetics in influencing user motivation. Additionally, the article demonstrates that well-designed user interface aesthetics optimize consumer experience, encourage involvement, and build confidence, leading to higher user motivation in m-banking. Key components, notably an aesthetically pleasing pattern, user-friendly navigation, and customizable themes, contribute to consumer satisfaction and loyalty. This article precisely highlights significant aspects for mobile banking developers and marketers to strengthen user interface design strategies, fostering a more interactive and inspiring user experience. It has some suggestions for future research to investigate the psychological impact of user interface aesthetics in digital banking.

Keywords: Consumer Motivation, Mobile Banking, User Interface Aesthetics, User-Friendly Navigation

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1. INTRODUCTION

The Internet of Things (IoT) and Industry 4.0 have revolutionized the banking sector by enhancing efficiency, security, and user experience through technologies (Sfar et al., 2017& Nwakanma et al., 2021). The innovations in banking institutions and information technology have significantly fostered customer-bank interaction, communication, and transactions (Giannakoudi, 1999). The financial services industry has undergone an IT-based revolution driven by the Internet, fundamentally transforming how banking services are offered (Makris et al., 2009). Since the early adoption of Internet banking, the studies have explored how financial institutions leverage the Internet to optimize operations and create strategic advantages (Tan & Teo, 2000).

The banking industry has undergone significant upheaval over the past decade, driven by shifts in consumer behavior, the emergence of new technologies, and the introduction of innovative products and services into the market (Malaquias & Hwang, 2016; Oliveira et al., 2016). Likewise, advancements in internet technology have significantly influenced the evolution of digital banking, transforming how financial services are delivered (Aldiabat et al., 2019). Mobile banking transformed when banking sectors (especially banks) offered digital transactions (Aldiabat et al., 2019). Also, mobile banking acceptance has been progressively advancing through continuous innovation and a diversified range of products (Rodríguez et al., 2016).

Finally, mobile banking (m-banking) utilization has depended on smartphones, which has stimulated a worldwide usability of the services, security, trustworthiness, and performance of mobile transactions (Tommi & Vesa, 2010). Despite the rapid advancement of mobile banking applications, a critical gap remains in understanding the direct impact of user interface design on consumer motivation (Laukkanen, 2016). While existing research primarily focuses on the technical aspects of mobile banking, limited attention has been given to the psychological and behavioral factors influencing user engagement (Hoehle & Huff, 2012).

This article discusses the relationship between user interface aesthetics elements, such as colorfulness, typography, layouts, dark modes, symbolism, icons, and consumer motivation within mobile banking applications. Understanding these factors can inform user interface design strategies that maximize consumer engagement and satisfaction. The article is structured as follows: first, it presents existing studies on the historical evolution of digital banking; then, it underlines the technological advancements in mobile banking, before discussing the role of user interface aesthetics in affecting consumer motivation. The article concludes with recommendations for future research on user interface design in mobile banking applications.

■2. EVOLUTION OF DIGITAL BANKING

The financial services industry has undergone a technological transformation, fundamentally changing how banking services are delivered; furthermore, internet banking enables users to conduct financial transactions such as fund transfers, bill payments, and stock trading through secure websites provided by financial institutions (Lee & Chung, 2009; Martins et al., 2014). Banking operations have transitioned from traditional physical banking to digital banking, with significant milestones in technological advancements occurring between the 1950s and 2015 (Narteh, 2014; Laukkanen, 2016).

Emerging from a basic service in the 1950s to a user-friendly approach for seamlessly managing payment operations from any location and shopping expenses without manual cash transactions, credit cards have transformed into universally adopted financial tools prevalent among users at all levels (Durkin, 2000). Correspondingly, First National City Bank (now Citigroup) unveiled the Everything Card in 1967 to advance user finance by enabling customers to purchase distinguished products and services on credit, a breakthrough that positioned the bank as an innovator in consumer credit services, and had a significant impact on modernizing the banking sector through the broad adoption of credit cards (Zumello, 2011).

Consumers have preferred to use credit cards as a payment method, with all historical transactions recorded in their accounts (Lee & Kwon, 2002). Electronic banking originated with the introduction of credit cards, allowing customers to perform transactions without cash (Narteh, 2014). Additionally, the development of credit account banking was planned by micro-U.S. banks in the early 1950s (Vanatta, 2018). These plans enabled users to shop for various

domestic goods using a single bank charge card, laying the groundwork for modern credit card systems (Vanatta, 2018). In the 1970s, the banking sector introduced some electronic financial services, operated at self-service banking terminals known as automated teller machines (ATMs) (Konheim, 2015).

For instance, Lloyds Bank launched its first "online" dispenser in December 1997, marking the transition from traditional cash dispensers to ATMs (Bátiz-Lazo, 2009). Customers can now check their balances and withdraw cash without physically visiting a branch because of the arrival of Automated Teller Machines (Laukkanen, 2016). Similarly, the organization of ATM has presented an in-depth overview of the ATM's development, utilization, and effects on the world's banking sector and analyzed the strategic choices and technology advancements that made ATMs easily accessible, providing insights into how these machines revolutionized consumer behavior and banking processes (Bátiz-Lazo, 2018).

The investigation by Scott and Zachariadis (2012) illustrated evidence of the origins and empowerment of the Society for Worldwide Interbank Financial Telecommunication (SWIFT) from 1973 to 2009, focusing on its role in the modernization of digital transfers and boosting worldwide financial connections. Online banking, which enables consumers to check balances, transfer funds, and manage accounts remotely, became possible with the proliferation of personal computers and Internet access (Zhao et al., 2010). While it has been in the UK since the beginning of the 1980s, electronic banking is still in its formative stages (Daniel & Storey, 1997).

According to Gligor and Bozkurt (2020), offering several payment alternatives, such as financial transfer options, digital wallets, and credit cards, adheres to the requirements and preferences of distinct users and improves platform assurance. As an illustration, the payment procedure was implemented for the MasterCard Pay Pass and VISA operations (Pasquet et al., 2008). Likewise, the Pay-Per-Click model is an example of a payment method where consumers are charged to check out websites with visual information; the system automatically manages the payment once the user clicks a paid link and confirms approval (Kawazoe et al, 2002).

A substantial transformation toward self-service options in banking service distribution channels happened during the 1980s (Hernandez & Mazzon, 2007). While traditional branch-based retail banking endures as the primary approach for operating financial transactions, digital technologies have transformed the delivery of individual financial services as they are developed and provided to users (Wang et al., 2003). Internet banking has been characterized as a modern form of information system that utilizes the advanced online tools and the World Wide Web (WWW) to facilitate users to perform financial transactions in the online space (Shih & Fang, 2004). As a consequence, active internet banking consumers can now conduct conventional banking transactions such as issuing cheques, making bill payments, transferring money, generating statements, launching a fixed deposit account, purchasing portfolio funds, and checking account balances (Chong et al., 2010).

Several banking services were influenced by electronic finance applications by the end of the 1990s, except for large-value corporate financing (Gkoutzinis, 2006). Moreover, online payment platforms, including PayPal, enabled access to trustworthy e-commerce transactions, which integrated digital banking into daily life (Turban et al, 2018). As a consequence, since its 1998 introduction, PayPal has experienced a significant rise in both its user base and income, with over 100,000 daily consumers and over $1,000 in operations every second (Williams, 2007). With 17 currencies and more than 100 countries, PayPal is accelerating growth (Williams, 2007).

The initial m-banking service was introduced in Europe in 1990, facilitating users to review account balances and process bill payments (Barnes & Corbitt, 2003). Financial operations involving checking account balances, transferring money between accounts, and paying bills are all managed by mobile banking (Cruz et al., 2010). Furthermore, m-banking involves the provision of banking and financial services through smartphones and serves as the foundation of mobile commerce (Tiwari et al., 2006). M-banking and payments are among the most popular mobile commerce applications, facilitating financial transactions (Ngai & Gunasekaran, 2007). More recently, the proliferation of smartphones and apps has enhanced the accessibility and convenience of mobile banking services, granting users immediate access to financial functions (Shaikh & Karjaluoto, 2015). M-banking has become progressively appealing to individual users and is forecasted to become a primary payment channel for corporate customers as well (Ji & Tia, 2022).

The "Google Wallet" app, which was released in September 2011, is one of the inventors of this technology, and many firms in the financial and communications fields, as well as others, were very intrigued by the financial opportunities of mobile wallets over a year after their launch (Ghag & Hegde, 2012). Google Wallet serves as a holder for payment cards, gift vouchers, point cards, and exclusive offers and delivers functionality through the applications with a built-in user interface and JavaCard-based applications operating on the encryption components (Roland et al., 2013). The user interface is utilized to defend the PIN-protected wallet, to monitor the transaction, to present unique cards, to choose the presently enabled card, to discover particular distribution, and to examine past transactions (Roland et al., 2013).

Following this three-month test phase, Google Wallet was officially launched in the United States in September 2011 (Chae & Hedman, 2013). From its inception, Google engaged with distinguished industry experts to demonstrate the required ecosystem to bring a smooth new payment option for users (Chae & Hedman, 2013). As a whole, Google Wallet has substantial capability and can significantly transform physical payment options, and distribute among Wallet users the prestige Mastercard credit card number, which is employed to facilitate the transaction, whichever saved card you use; hence, Google Wallet offers users a highly secure, fast, and seamless payment experience (Ghag & Hegde, 2012).

The advancement of digital security concerns in information systems and the need to ensure unbreakable cybersecurity patterns have prompted system programmers and engineers to configure reliable protection mechanisms that integrate the use of passwords, PINs, and navigation codes for authorization and verification (Mwema et al., 2023). Furthermore, the banks have implemented biometrics, related to identifying an individual based on users' physiological or behavioral characteristics, which could distinguish between an authorized person and an impostor (Ross et al., 2006). Biometrics can offer a higher level of protection than classic identity verification techniques, such as one-time passwords (OTP), security questions (SQ), CAPTCHA, and personal identification numbers (PIN) (Ross et al., 2006). Strengthening these resources is obtainable through permission-based accessibility and encryption from fraudulent authorization (Uchenna et al., 2018).

Fingerprint-based biometric systems, implemented with a high level of assurance and solid-state sensors, are progressively utilized across distinguished devices and applications, such as welfare disbursement, phone access, and laptop log-ins, by both banking industries and users (Basha et al., 2011). Fingerprint-based authentication has surfaced as a modern, strong contender to substitute traditional password-based verification and confirmation, especially with the significant growth in digital banking operations (Tsai et al., 2012). A security scheme

involves a fingerprint biometric for authentication, which has been utilized to ensure protection and consistency (Khan et al., 2008). Encryption analysis results have displayed that the proposed system delivers safe, robust, and dependable remote authentication for mobile users across unsafe digital channels (Khan et al., 2008). Some financial institutions also integrate biometrics, establishing a highly secure defense layer when multiple authentication factors are combined with biometric verification (Khan et al., 2023).

3. BANKING AND TECHNOLOGICAL ADVANCES

The widespread acceptance of mobile banking and the significance of these services for consumers, banks, and financial institutions have seen an uptick due to the extensive adoption of mobile technology in daily life (Chen, 2013). Mobile banking has been generally characterized as leveraging a phone or other mobile device for performing financial transactions associated with a customer's account (Szczepanik & Jóźwiak, 2018). User views and reliance in the initial stage of digital banking contributed substantially to the foundation for modern digital and mobile banking platforms (Howcroft et al., 2002). The current research characterizes mobile banking as a vital aspect of modern financial services where a consumer utilizes mobile devices and mobile communication channels for implementing financial transactions as a component of an electronic procedure (Anderson, 2010). Through m-banking, bank users can access a smartphone or portable computer to conduct banking activities, including paying bills, checking account balances, locating ATMs, and transferring money (Oliveira et al., 2014).

According to Shaikh and Karjaluoto (2015), mobile banking has been utilized since the ’90s. Mobile banking has supported various popular service functionalities, including commercial transactions, information providing, and announcements and alerts (Tsai et al., 2012). Similarly, mobile banking has enabled consumers and organizations to conduct financial transactions such as savings, cash transfers, and stock market deals with banks at any time and virtually anyplace (Bankole et al., 2011). It has handled the following using the mobile device: accessing the bank account, balance inquiries, bill payments, deposits, and conducting financial transactions (Railiene, 2014). Finally, the scrutiny of modern mobile banking relies on a resilient security infrastructure and thorough protocols implemented to encrypt private financial data and operations (Susmitha et al., 2024).

Significantly, the financial sector provides its users with a vast array of channel options, including traditional branch services, self-service devices like automated teller machines (ATMs), telephone banking, internet banking, and mobile banking (Al-Somali et al., 2009; Hoehle & Huff, 2012; Sharma & Govindaluri, 2014). Many banks are motivating their customers to adopt self-service technology, which allows additional benefits such as cost savings and cross-selling activity (Al-Somali et al., 2009; Hoehle & Huff, 2012; Sharma & Govindaluri, 2014). Likewise, mobile payment solutions, including Google Wallet and Apple Pay, have transformed the purchasing experience by offering seamless digital transactions (Chae & Hedman, 2013). Fingerprints, which are the ridge and furrow patterns on the fingertips, have been commonly used for recognizing users (Chae & Hedman, 2013).

Long ago, fingerprints were utilized to facilitate verification, and their biological features were easily identifiable (Jain et al., 1997; Jain et al., 1997). The adoption of blockchain technology in m-banking guarantees decentralization, transparency, and permanence, making it challenging for attackers to breach the system without being recognized (Aryee, 2023). Extensive security features, including online mode access, two-factor authentication, suggested login credentials to deter weak passwords, and frequent inside updates and security audits to detect and fix deficiencies, are also included in the app (Aryee, 2023). Additionally, blockchain

technology establishes an auditable and transparent ecosystem by offering tamper-evident transcriptions of all network activities and transactions (Habib et al., 2022). This capability is specifically significant in mobile networks, where securing confidential user information and money transfers is essential (Xiong et al., 2020).

Technology can be assumed as an engaged tool with the capacity to incorporate, associate, and retrieve other resources; therefore, the adoption of technology is a fundamental element of collaborative value creation (Zainuddin et al., 2016). Banks are starting to deliver algorithm-based customer service and artificial intelligence (AI)-based mobile banking services (Iberahim et al., 2016). A majority of banks, digital platforms, and users work collaboratively and simultaneously to achieve their shared goals, facilitated by the alignment of AI-driven insights that enhance customer services through mobile banking (Kristensson, 2019). As well, financial sectors provide a more unique value proposition in the artificial intelligence and m-banking platforms, which users then scrutinize from their utilization, verifiable resources, and specific conditions (Sandström et al., 2008).

Technology's parallel advancement with service distribution is exemplified by AI, particularly in digital banking via mobile, in which it transforms how value is recognized and obtained (Manser Payne et al., 2021). AI-driven engagements supply superior value in utilization by sending instant, customized financial solutions such as account consultation, portfolio planning, insurance solutions, and debt integration (Manser Payne et al., 2021). Chatbots, driven by AI, have become essential tools for enhancing the user experience in the banking industry (El-Shihy et al., 2024). Financial organizations now understand how important it is to support outstanding customer service and utilize chatbots to draw in and keep users in this age of digital transformation (Ariff et al., 2013; Ngo & Nguyen, 2016) and provide customers with a more customized banking experience with AI services in mobile banking (Rust & Huang, 2014).

Overall, mobile banking has significantly evolved, integrating advanced technologies to improve user convenience and security; thus, the integration of AI and blockchain improves expandability, cybersecurity, operational effectiveness, and personalization, and enables banks to distribute premium-quality services rather than being constrained by a single technological approach (Vedapradha & Ravi, 2021). Artificial intelligence can be leveraged to improve the user-centric banking functions, whereas blockchain can strengthen internal systems and workflows (Dewasiri et al., 2023). Blockchain is combined with biometric authentication systems for financial operations that require authentication and verification (Ji & Tia, 2022). Chatbots should be substantiated by the financial institution for employees' engagement (Suhartanto et al., 2022). AI-driven customer service, blockchain for security, and biometric authentication have transformed how users interact with banking services and gain confidence in utilizing banking services (Suhartanto et al., 2022).

4. ROLES OF USER INTERFACE AESTHETICS IN CONSUMER MOTIVATION

According to Chaouali et al. (2020), users' adoption intentions are motivated by the perceived value of mobile banking applications, which is influenced by design aesthetics. Researchers underline that user views are significantly affected by factors such as layout, color schemes, and overall visualization (Creusen & Schoormans, 2005). Concerning emotional value, users "can value the 'look' of a product purely for its own sake, as looking at something beautiful is rewarding in itself" (Creusen & Schoormans, 2005). Similarly, a visually appealing mobile banking app enables the process to be simpler to deliver an enjoyable environment (Walls, 2013). Study indicates that an alluring dimension may elicit physiological users' visceral

responses in the structure of enjoyment (Pham, 2004). Considering how design aesthetics influence sensations (Liu & Jang, 2009; Cai & Xu, 2011) and is probable that a visually appealing mobile banking software enriches users' subjective experiences by rendering users comfortable (Wang et al., 2003; Cai & Xu, 2011).

According to a study by Sheth et al. (1991), design aesthetics can thereby improve the predicted emotional value for the mobile banking application or its perceived capability to trigger or prolong emotions or psychological states. Beyond surface-level design, existing research highlights that mobile banking affects wider consumer behavior dynamics, illustrating both functional and affective dimensions (Laukkanen & Kiviniemi, 2018). Thus, many studies have demonstrated that aesthetics can improve performance (Moshagen et al., 2009). Finally, assessments of a website's content might be influenced by its visual appeal, and user interface aesthetics are fundamental in capturing users' intention and psychological enjoyment (Aladwani & Palvia, 2002).

The fact that the present icon corpora for use in investigations depend on using existing icons was a major motivator for our effort; hence, users' perceptions and performance are precisely impacted by their prior familiarity with the symbols (Isherwood et al., 2007). More thoroughly, dark mode is a low-light user interface that applies darkness as the primary backdrop color, commonly black or grayscale tones, and has been used as the default white user interface for decades, but this is different (Damnjanovic et al., 2024). Developers discovered that dark-themed interfaces minimize eye strain in response to our increased screen application, especially at night or in low-light conditions (Damnjanovic et al., 2024). A better working environment and fewer headaches are evidence of reduced eye strain (Damnjanovic et al., 2024). Notably, a study indicates that aesthetically pleasing layouts inspire the time users to engage in effective and satisfactory utilization, meeting consumers' expectations and leading to a strong relationship with banking services (Grossbart et al., 1990).

In the same vein, Booms and Bitner (1981) proposed the perspective of servicescape as the ecosystem in which the transaction between the financial institution and users occurs smoothly, accentuating the influence of the environmental design (e.g., layouts), in which a service process operates, shaping users' behavior. Overall, research has suggested that usability and user trust in mobile banking applications are significantly influenced by the design and functionality of the interface (Zhou, 2012; Alalwan et al., 2016). As well, capitalizing on consumer responses and advocacy-driven branding techniques can strengthen UI authenticity and confidence in mobile banking applications (Shirahada & Kosaka, 2012). The user interface features of the mobile banking app should be convenient to navigate and well-structured (Al-Somali et al., 2009). It must have efficient search capabilities and easily accessible, clear content (Gharaibeh et al., 2018). In addition to ensuring text readability, the color scheme should be visually appropriate (Gharaibeh et al., 2018).

Thus, user interface aesthetics significantly impact m-banking users through ease of use, user-friendly navigation, and individual customization (Gharaibeh et al., 2018). For instance, to offer users an extensive digital banking experience, ACLEDA Bank has been steadily developing its digital infrastructure; therefore, the consequence is the ACLEDA Super App, a secure, feature-rich platform that unifies banking operations, securities trading, public service payments, and cultural connectivity (KiriPost, 2025). ACELEDA is one of the most popular banks in Cambodia; its mobile banking application offers various user interface aesthetics (UIAs), including Basic, Modern, International Women's Day, Linear, Lunar, Valentine, and Dynamic themes (see Fig. 1).



Figure 1. ACELEDA mobile banking application user interface aesthetics

5. CONCLUSION AND RECOMMENDATIONS

This review article has discussed the roles of user interface aesthetics in influencing consumer motivation in m-banking apps. It indicates that well-designed user interface features, covering colorfulness, typography, layouts, dark modes, symbolism, and icons, significantly inspire consumer engagement and satisfaction by developing visual appeal, readability, ease of use, and personal attachment. A strategically designed user interface facilitates creating an intuitive interface and effortless user experience, optimizing cognitive ease, empowering usability, and strengthening confidence and trustworthiness.

Also, dimensions such as seamless transitions, quick user interactions, and accessibility features contribute to a more user-friendly, accessible, and customized digital banking platform, ultimately enhancing the adoption level and ensuring long-term retention. As discussed above, previous research tends to support the concept that the visual characteristics of m-banking interfaces empower usability, seamless navigation, personal customization, trust, and psychological enjoyment. Considering the rising emphasis on mobile banking, future investigations should study the direct correlation between specific user interface aesthetics dimensions and consumer behavior. Correspondingly, the diversification of AI-driven individualization, blockchain, and biometric advancements in user interface design could further boost user experience.

This article has some recommendations. To empower consumer motivation in m-banking, financial institutions should give precedence to user interface aesthetics by expanding the application of user-focused design strategies. This includes tailoring colorfulness to enhance usability and aesthetics, improving typography, enhancing readability, and retaining a well-designed interface to facilitate navigability. In addition, integrating customizable dark mode options, functional icons, and symbolic components can augment consumer satisfaction.

Hence, AI-driven personalization should be utilized to customize the user interface experience depending on the user preferences, increasing consumer involvement insights. Protection features, such as biometric authentication and blockchain adoption, should also be harmoniously integrated into the user interface to advance ease of use and consumer confidence. Banks should conduct frequent user interface assessments and gather consumer feedback to guarantee continuous development and alignment with transforming user expectations.

As this article is a review article, future research should empirically investigate the direct impact of particular UI aesthetics, including color psychology, typography features, and icon designs, on consumer behavior in m-banking. More importantly, future research can explore the

influence of AI-driven user interface personalization on consumer engagement and trust. Cross-cultural and demographic comparison research might contribute insights into how user interface options differ among consumers. Another significant aspect for investigation is the role of innovative technologies like augmented reality and virtual assistants in enriching the user interface experiences. Ultimately, longitudinal studies can scrutinize how transformation in user interface design affects long-term user loyalty and m-banking adoption levels.

Acknowledgement

This paper does not receive financial assistance from any governmental, private, or non-profit organizations.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this paper.

Data Availability

Data supporting the findings of this study are available from the corresponding author upon request.

Ethics Declaration

The research was conducted using only publicly available secondary data, with no direct involvement of human participants. Accordingly, the study did not require formal ethical approval.

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