



Article

Mobile Banking Adoption: A Multi-Factorial Study on Social Influence, Compatibility, Digital Self-Efficacy, and Perceived Cost Among Generation Z Consumers in the United States

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Abstract

The introduction of mobile banking is essential in today's financial sector, where technological innovation plays a critical role. To remain competitive in the current market, businesses must analyze client attitudes and perspectives, as these influence long-term demand and overall profitability. While previous studies have explored general adoption behaviors, limited research has examined how individual factors such as social influence, lifestyle compatibility, financial technology self-efficacy, and perceived usage cost affect mobile banking adoption among specific generational cohorts. This study addresses that gap by offering insights into these variables, contributing to the growing literature on mobile banking adoption, and presenting actionable recommendations for financial institutions targeting younger market segments. Using a structured questionnaire survey, data were collected from both users and non-users of mobile banking among the Gen Z population in the United States. The regression model significantly predicts mobile banking adoption, with an intercept of -0.548 ($p < 0.001$). Among the independent variables, perceived cost of usage has the strongest positive effect on adoption ($B = 0.857, \beta = 0.722, p < 0.001$), suggesting that adoption increases when mobile banking is perceived as more affordable. Social influence also has a significant positive impact ($B = 0.642, \beta = 0.643, p < 0.001$), indicating that peer influence is a central driver of adoption decisions. However, self-efficacy shows a significant negative relationship ($B = -0.343, \beta = -0.339, p < 0.001$), and lifestyle compatibility was found to be statistically insignificant ($p = 0.615$). These findings suggest that reducing perceived costs, through lower fees, data bundling, or clearer communication about affordability, can directly enhance adoption among Gen Z consumers. Furthermore, leveraging peer influence via referral rewards, Partnerships with influencers, and in-app social features can increase user adoption. Since digital self-efficacy presents a barrier for some, banks should prioritize simplifying user interfaces and offering guided assistance, such as tutorials or chat-based support. Future research may employ longitudinal designs or analyze real-life transaction data for a more objective understanding of behavior. Additional variables like trust, perceived risk, and regulatory policies, not included in this study, should be integrated into future models to offer a more comprehensive analysis.



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Keywords: mobile banking adoption; Generation Z; financial technology (FinTech); perceived cost; social influence; technology self-efficacy; lifestyle compatibility; digital banking behavior; consumer attitudes

1. Introduction

1.1. Background Information

The introduction of mobile banking is essential in today's financial sector, where technological innovation is critical [1]. To remain competitive in today's market, businesses must analyze client attitudes and perspectives as they impact long-term demand and company profitability [2]. Recent technological developments have made it possible to obtain financial services in new ways. These consist of basic Automated Teller Machine (ATM) cards, debit cards, cardless banking, online banking, bill pay services, and mobile banking, which enables a client to contact a bank via a mobile device [3]. The transition from traditional banking to agency banking and, more recently, mobile banking has made bank products more technologically advanced and accessible. Thanks to mobile banking, news circulates more quickly, and financial market volumes are greater than ever [4]. Like any other financial market, the banking industry is undergoing a rapid and profound transformation due to the influence of technology [5]. Compared to earlier decades, the services offered by local banks have improved significantly. Consumers can now easily conduct transactions from anywhere at any time using mobile banking [6]. Despite consumer demands for increasingly sophisticated mobile services, these offerings have not proven robust. Compared to the general demand for mobile commerce services, the need for basic mobile banking is greater [7]. Banks made mobile banking available to their clients so they could make use of all the advantages of banking on their phones. Customers feel comfortable performing mobile banking transactions because they have unrestricted access to bank services [8]. Mobile banking has the potential to increase domestic savings, increase low-cost money transfers from the diaspora, and lower financial transaction costs, all of which lower operating expenses and, consequently, the economy as a whole [9].

Developed and developing countries began offering mobile banking services in the early 2000s [10]. This was the most modern method of employing information technology (IT) to provide banking services to customers. However, adoption patterns have differed between affluent and underdeveloped countries [11]. In contrast to other forms of technology that were quickly adopted by developed countries, mobile banking did not provide customers with compelling incentives to use the service. However, consumers in underdeveloped countries saw mobile banking as a way to interact with the outside world and obtain the much needed economic advantages [12]. Despite the convenience benefits, most highly developed nations did not embrace mobile banking as expected due to the quality of the information [13]. The promise of greater mobility offered by mobile banking had not materialized in Europe's established markets; in emerging nations, however, the potential was different and was influenced by the cost and accessibility of mobile phones [14]. The poor in developing countries hoped to benefit the most from mobile banking, although it started in wealthy countries [15]. Because of this, mobile banking has gained greater traction in developing countries than any other modern technology, including personal computers, landlines, and television [16]. The most likely places for these technology-based services were thought to be developing countries [17]. Mobile banking has had a greater influence in countries with limited spread of land-based networks, and consumers in emerging and underdeveloped economies seem to have adapted to the promise of mobile devices [18]. The rise in mobile banking usage offered disadvantaged nations new hope and allowed them to take advantage of modern technology more fully than before [19].

Mobile banking is still underutilized and has much room to grow compared to other self-service banking options like ATMs or Internet banking [20]. Mobile banking apps are still behind, even though smartphones are often used for Internet access. Several factors, such as security concerns, the need for knowledge, and ease of use, limit its broader use [21]. Consumers value security highly while utilizing mobile banking, and they often avoid

using technology due to perceived risks [22]. Cultural factors and generational preferences have a large impact on mobile banking usage. Generation Z and millennials dominate online and mobile banking because they prefer convenience. In the US, 97% of millennials utilize mobile banking, a greater percentage than the overall consumer average of 89% [23]. The user-friendliness of mobile banking is also valued by 67% Malaysian millennials in Southeast Asia [24], indicating a readiness to adopt new technologies. Various financial incentives, such as monetary and non-monetary awards, have been shown to effectively attract and keep customers when products or services are advertised [13]. Few studies presented empirical evidence to show how this new payment method affected usage, especially with regard to the financial incentives offered by mobile pay companies. A recent study examining the pull, push, and anchoring factors of mobile payment users' switching behavior found that financial incentives provided by mobile payment applications encourage users to switch [25].

In a study involving young individuals in the United States, ref. [26] reported that cashback and discounts positively influenced their willingness to adopt near-field communication (NFC) mobile payment systems. Furthermore, previous research on mobile banking adoption has consistently emphasized the importance of perceived risk and trust. Refs. [27,28], these two variables were deliberately omitted from the current research. This was formulated to restrict the range of inclusion to variables that were more precisely relevant to Generation Z consumers, who have grown up as digital natives and may be different from previous generations in their behavioral predispositions. Current studies [29,30] have determined that Gen Z consumers have relatively lower risk aversion and higher default trust in computer-mediated technology due to early exposure and frequent use.

The selection of the four most applicable variables, i.e., social influence, compatibility, digital self-efficacy, and perceived cost, was reasonable as they are very relevant to Generation Z's unique behavioral and technological characteristics, as evidenced in existing research [31], who note Gen Z's extremely high level of digital literacy and socially oriented decision-making. The exclusion of risk and perceived trust was deliberate, as empirical research suggests that Gen Z is less risk-averse and more likely to trust computer-mediated technology since they have grown up surrounded by digital environments [32], and therefore, such factors become less potent in this case. Although trust and subjective risk are proven determinants in more generic models of technology adoption such as TAM or UTAUT, their lower generality to Gen Z is revealed by the findings of their liking for frictionless, socially enabled, and low-cost digital solutions [33]. Unlike industry designs, research evidence dismisses hyper-targeted engagement in security marketing to validate that Gen Z is obsessed with social influence and compatibility, and thus leading banks to redesign user interfaces and enhance peer-driven campaigns, thus giving credible evidence to increase mobile banking usage. The study contributes to the theoretical and empirical literature on mobile banking adoption and Gen Z consumer behavior. Contributions are theoretical by expanding the UTAUT2 model through the addition of digital self-efficacy and lifestyle compatibility, variables most typical of digitally born consumers, but previously less theorized in fintech adoption theory. Second, the study is focused on Generation Z in America, an emerging but comparatively lesser-researched online financial services market, but one that has not even been fully investigated using empirical analyzes. Unlike past studies that examined more conventional antecedents such as perceived risk and trust, this article presents a behavioral-contextual understanding, one suited to Gen Z's social, digital, and economic environment. The study offers banks concrete suggestions on how to improve mobile banking design, target marketing, and customer interactions through shaping offerings along Gen Z's requirements and digital abilities.

1.2. Problem Statement

Rapid growth of mobile banking has changed the financial landscape, particularly among Generation Z customers in the United States [34]. This cohort, referred to as digital natives, is expected to lead the way in adopting mobile banking services, given their level of comfort with technology and preference for increased interaction. However, the adoption rate of Generation Z customers has been inconsistent, suggesting that several psychological, social, and economic drivers influence their willingness to adopt mobile banking services [23]. Despite previous studies exploring general adoption behaviors, little is known yet about how individual factors such as social influence, lifestyle compatibility, financial technology self-efficacy, and perceived usage cost can drive the acceptance of mobile banking in this specific generational group [35]. Social influence is particularly important due to the way younger generations formulate decisions on socially ubiquitous and peer-endorsed networks [33]. Another critical determinant of mobile banking adoption is compatibility, meaning the degree to which the service aligns with users' existing financial habits and lifestyle preferences [36]. Given their breadth of connectivity to a digital platform, Generation Z members might be more influenced by peers, influencers, or online reviews when deciding whether to adopt mobile banking [31]. Another factor that has been shown to influence adoption is compatibility: How do user financial and lifestyle patterns align with mobile banking [37]. Gen Z, specifically seeks seamless and efficient digital experiences, so the level of integration between mobile banking and their present financial behaviors could significantly impact adoption decisions.

Moreover, their belief in their ability to use mobile banking or self-efficacy is a major psychological factor that influences adoption [25]. Some Gen Z customers with minimal financial knowledge may feel confident in completing financial transactions using mobile applications despite being tech-savvy. Fear of fraud and security threats will probably cause this reluctance to go deeper, forcing some to return to traditional methods. Perceived use costs, financial outlays, and mental strain can also limit adoption. For instance, Gen Z customers might be discouraged from fully embracing mobile banking to high transaction fees, hidden costs, or complicated user interfaces [38]. As financial digitalization is being accelerated during a time when a new generation is coming to maturity, it is important for traditional and digital banks alike to understand what drives the use of mobile banking, especially among Gen Z. Differently from previous studies on perceived risk or trust, this research considers four context-specific antecedents selected due to their relevance to Gen Z behavior: (1) Social influence, as Gen Z's digital decisions are peer-determined; (2) Lifestyle compatibility, as banking services need to accommodate their hectic, mobile-first lifestyles; (3) Digital self-efficacy, as natively digital consumers feel competent using fintech services; and (4) Perceived cost, a pragmatic factor among a generation in school, mostly or at the beginning of working life. These definitions were taken from a longer UTAUT2 model, with some modifications to better reflect the evolving fintech landscape and the particular needs of this consumer group. This focused approach is necessary to bridge gaps in the literature and offers pragmatic advice on how mobile banking apps can get the most response from young consumers. As mobile banking plays a more vital role in digital transformation and financial inclusion, banks and financial service providers must understand the interplay between these components. As for Generation Z consumers, removing related parts of social influences, compatibility, self-efficacy, and use charges could enhance the adoption price and overall consumer experience. This study aims to address this knowledge gap by providing insight into these factors, contributing to the growing body of work on mobile banking adoption, and generating actionable recommendations for financial institutions targeting younger market segments.

1.3. Research Questions

1. What is the influence of social influence on mobile banking adoption?
2. What is the influence of compatibility on mobile banking adoption?
3. What is the influence of self-efficacy on mobile banking adoption?
4. What is the influence of the cost of usage on mobile banking adoption?

1.4. Research Objectives

1. To determine the influence of social influence on mobile banking adoption
2. To determine the influence of compatibility on mobile banking adoption
3. To determine the influence of self-efficacy on mobile banking adoption
4. To determine the influence of the cost of usage on mobile banking adoption

2. Literature Review

2.1. Theoretical Framework

The theories that will investigate the link between mobile banking services between perceived usefulness, acceptability, and simplicity of use are highlighted in the theoretical review. The researchers study the arguments of the Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), and Theory of Planned Behavior (TPB) theories regarding this subject. In addition, it also provides critical evaluation and analysis of arguments of the various theories/models used to study the variables and their relationships to understand the study problem.

2.1.1. The Technology Acceptance Model

Many prominent models explaining the intention to use technology have recently been developed. These models originated in psychology, information systems, and sociology [39]. In this regard, one of the well-known theories is the Technology Acceptance Model (TAM) based on the Theory of Reasoned Action (TRA) [40]. TAM has been evaluated and used several times throughout the years by the mobile service industry to explain and provide predictions about future consumer behavior regarding the adoption and acceptance of new technologies and developments [32].

The attitude is determined by both the perceived utility and the perceived ease of use. Perceived usefulness is also influenced by perceived ease of usage. Because of a weak direct relationship between perceived usefulness and attitude, a strong direct relationship between perceived usefulness and intention, and a partial mediation of the impact of beliefs on intention by attitude, ref. [40] did not include the attitude towards the use of technology in their final model. This was described as coming from people who, although not having a good effect (attitude) on the use of a technology, intended to use it because they found it beneficial [32]. Research has shown that behavioral intention, which is predicted by perceived utility and perceived ease of use, determines an individual's actual system utilization. The perceived utility directly and considerably impacts the intention of the behavior to use a given technology [40]. Providing a foundation for determining how external factors affect internal beliefs, attitudes, intentions, and usage is one of the main goals of TAM [40]. When comparing TAM with studies based on Innovation Diffusion Theory [41], a more intricate set of assumptions is used to forecast adoption. Rogers's relative advantage is comparable to perceived usefulness in TAM, whereas complexity is equivalent to ease of use. According to [42], "perceived innovation characteristics" are central in explaining adoption or usage rates for innovations. The main purpose of TAM is to identify the factors that affect the adoption of information systems by users or to explain the rejection of such technologies by users [43]. TAM looks at relationship connections between conduct, purpose, perspective, and belief. According to [44], it targets two critical

determinants of the intention of users to use computer-related systems or applications, namely “perceived ease of use” and “perceived usefulness.” According to the Technology Acceptance Model (TAM), user intent determines how much users will use the technology. The behavior of user intentions toward real information system is based on the attitude of the user [27]. The predictive ability and parsimony of TAM make it simple to use in various contexts. Though parsimony is a strength of TAM, it is also a significant drawback of the paradigm. Although TAM is predictive, its generality does not provide enough information to give system designers the knowledge they need to build user acceptability for new systems [42]. According to a wealth of studies conducted in the last 10 years, the intention to use is significantly affected by the perceived ease of use, directly or indirectly, through its influence on perceived usefulness [42]. One of the shortcomings of TAM is that it only addresses perceived usefulness and ease of use, two factors that affect users’ acceptance and use of technology; it does not address how these perceptions are formed or how they might be swayed to encourage users to embrace and use technology more frequently [28]. Therefore, practitioners need a greater understanding of the antecedents of perceived utility and perceived ease of use to decide which levers to pull to alter these beliefs and, in turn, technology usage [45].

2.1.2. Theory of Reasoned Action

TRA aims to demonstrate how an individual’s beliefs, attitudes, and intentions toward a certain behavior result in that behavior [46]. One example is the subjective norm, which is the individual’s assessment of societal pressures over whether or not to continue the behavior. which reflects the extent to which mobile banking aligns with existing user values and lifestyle, significantly influences behavioral intention by reinforcing socially aligned perceptions of ease, usefulness and trust in technology [47]. As noted in ref. [48], individuals are generally logical and tend to use the available information in a systematic way. Consequently, they assess the potential outcomes of their actions before deciding whether to proceed. Within this framework, behavior can be predicted based on the individual’s intention, which stems from their attitude toward behavior (e.g., whether it is considered positive or negative) and subjective norms, as indicated in [49]. The behaviors mentioned in the model are those that the person can manage with “free will,” do not require any particular abilities or resources, and may be carried out whenever they choose [16]. The theory states that intentions based on a user’s attitude and subjective norm (social environment) regarding behavior are better predictors of behavior toward technology usage. A user’s attitude towards an object influences intentions and behavior toward the object in question [49]. The reasoned action hypothesis has been criticized in many ways. First, some academics have questioned the theory’s ability to explain behavior’s immediate origins, which means other behavior determinants are not very useful [2]. These academics contend that, in addition to attitude toward behavior and subjective standards, additional factors influence an individual’s intention. Second, behaviors requiring other people’s resources, opportunities, collaboration, and talents cannot be predicted by the TRA [50].

2.1.3. Theory of Planned Behavior

The goal of TPB, which grew from TRA, was to comprehend and forecast human behavior influences and the tactics required to influence a target behavior to change [10]. Unlike theories of emotional processing, it is based on cognitive processing [51]. According to this theory, behavioral intention is a determinant of behavior as it is based on individual’s intention to engage in a behavior [52]. TPB assumes that a person’s intention to carry out a particular activity influences that person’s behavior [53]; behavioral intentions are

why people attempt to carry out the behavior in question [54]. According to the idea, a correlation between behavior and attitude information is highest when both behaviors and attitudes are measured with the same level of detail [55]. The following components make up behavior: an action taken in the direction of a goal, in a particular environment, and at a certain moment [56]. According to [50], there are some reasons why the hypothesis of planned behavior has been criticized. First, there may be bias in how people perceive their level of control over their actions or circumstances. Second, there has been debate about the causal chain that leads from perceived behavior control to intention and ultimately to action. According to [57], it suggests that one will act on a behavior just because they believe they have control over it. This is not true, especially with bad conduct. Third, there has been criticism of the TPB's conceptual foundation. It cannot compete with other comprehensive theories of human behavior by adding one additional variable, perceived behavioral control [58]. Last but not least, the TPB does not specify how people create and carry out their plans [59].

2.2. Empirical Literature

2.2.1. Emerging Technologies in Mobile Banking

Emerging mobile banking technologies have radically impacted access to financial services. The evolution of artificial intelligence (AI) and machine learning to more advanced, user-friendly, and secure mobile banking [14]. AI chatbots, fraud prevention and detection systems, and personalized advice and finance tips have transformed customer interactions, making banking services more efficient and responsive [60]. Such innovations improve the user experience by offering real-time help, securing transactions, and personalizing financial advice. Consumer frankness and the advent of digital banking solutions have focused firms on their adaptation as customers expect to explore the latest banking alternatives [1].

One of the most impactful innovations in mobile banking technology is AI-powered chatbots [61]. These virtual helpers use natural language processing to instantly understand and respond to customer queries 24/7 [62]. Unlike conventional customer service models, chatbots provide immediate feedback, reduce waiting times, and seamlessly increase service efficiency [63]. Such systems can respond to several common questions, such as balance checks, transaction tracking, and account management [4]. Chatbots automate many repetitive tasks so that human representatives can address more complex clients' needs, thus making a more streamlined and productive banking experience. Moreover, as AI algorithms have improved their ability to engage in more nuanced conversations and provide personalized assistance, chatbots have also become more sophisticated [1].

When financial models are developed further due to AI-based risk analysis, quantum security, blockchain, and biometric authentication, mobile banking will fortify security, efficiency, and decision-making. For example, AI-enhanced risk assessment models use machine learning to scrutinize up-to-the-minute transaction data, identify potential cases of fraud, and improve credit scoring, evolving the predictive accuracy of risk assessment models beyond traditional approaches [1]. Still in its infancy, quantum computing presents both threats and opportunities as quantum algorithms could ultimately break existing encryption standards, prompting the development of post-quantum cryptography by banks [32]. Its decentralized nature and tamper-proof ledger help reduce mobile banking fraud [45] and secure smart contracts and DeFi transactions. On the other hand, biometric authentication, which includes fingerprint scanning, facial recognition, and voice authentication, provides a more secure alternative to passwords by utilizing artificial intelligence (AI)-powered behavioral biometrics to identify anomalies and prevent identity fraud [64]. As these technologies evolve, financial institutions must adjust their models to improve security, compliance, and user experience while mitigating challenges such as quantum

vulnerabilities, blockchain regulation, and AI-driven biases in decision-making. Conversational AI allows natural interactions while minimizing manual navigation, improving user satisfaction [65].

On the other hand, AI and machine learning have strengthened the security of mobile banking by building fraud detection. Traditional fraud detection methods use static rules that do not, in many cases, respond to new and evolving tricks of fraudsters [61]. In contrast, AI-powered fraud detection systems delve deep into transaction patterns and user behaviors, highlighting transactions that are out of the ordinary and could potentially be fraud [40]. Machine learning algorithms can examine massive datasets in seconds, flag potentially fraudulent transactions, and notify users and financial institutions before more damage is done. These preventive measures against fraud generate credibility and safeguard the monetary records of customers [66]. Furthermore, this AI-powered fraud detection system becomes smarter by training with past fraud cases and identifying new emerging threats [40]. AI and machine learning-powered personalized financial advisory services have also redefined mobile banking [61]. AI is not inclined to impose uniform advice based on a more general set of published guidelines prevalent in traditional banking; instead, it looks in detail at spending behavior, income maturity, wealth in the form of trends and timelines, and data to create a more tailored financial suggestion suited to the unique financial trajectory of an individual client, allowing complex calculations of financial 'successes' or 'failure' [67]. These systems help users navigate their finances by providing personalized recommendations for budget plans, investment opportunities, and savings strategies, all aligned with their financial situation [68]. Instead, it can utilize predictive analytics that enables AI to predict future financial challenges and offer proactive suggestions to empower users to take control of their finances. By integrating personalized financial insights into mobile banking applications, the app can boost user engagement and help them better manage their finances [14]. AI and machine learning in banking have even increased customer engagement and satisfaction by automating all of the above processes [60]. These insights, courtesy of AI, help banks anticipate customer needs and offer the right promotions, rewards, and financial products tailored to their use case. For instance, it uses machine learning algorithms to scrutinize transaction history and user preferences to suggest relevant financial products (loans, credit cards, investment solutions, etc.) [1]. This personalization improves the banking experience as customers receive services that are more relevant and valuable [69]. In addition, AI-driven analytics enable banks to fine-tune their marketing efforts, so customers receive offers that correspond to their financial interests and behaviors [14].

Another technology powered by AI is voice recognition technology, which is making mobile banking more secure and convenient [62]. This solution enables users to log into their accounts and authorize transactions using biometric verification instead of traditional passwords [63]. By capturing the voice pattern, the risk of a breach is reduced as no one voice is like another. In addition, voice-activated banking assistants allow people to access banking functionality via voice commands, making it easier to perform transactions, particularly for disabled individuals or those who favor hands-free interaction [4]. With the continued advances in voice recognition technology, the opportunity for it to be immersed in the mobile banking world is endless [40].

In mobile banking, voice recognition and NLP-based banking services are changing the entire concept of banking with hands-free and AI-powered interaction, which is creating a significant impact on the adoption of Generation Z banking services. The use of voice assistants, such as Siri, Alexa, and Google Assistant, is becoming increasingly common, causing banks to incorporate voice-activated banking to allow convenient transactions, balance inquiries, bill payments, and financial advice utilizing natural language processing

(NLP) [70]. This practice increases convenience and availability, especially for digital native Gen Z customers, who enjoy rapid, easy-to-navigate, and tailored banking services [71]. Biometric voice authentication can also improve security by identifying users based on different vocal patterns, reducing the risk of fraud [71]. However, some factors might slow down widespread adoption, including privacy issues, the accuracy of speech recognition, and resistance to voice-based security systems [69]. Notwithstanding these barriers, however, as NLP and AI technology continue to mature, voice banking is poised to emerge as the primary catalyst for mobile banking adoption, offering Gen Z a frictionless, secure, and immensely engaging financial interaction.

The Human-AI interaction in mobile banking is transforming the landscape of financial transactions and decision making processes, offering improved efficiency, personalization, and accessibility. Natural language processing (NLP) and machine learning-based AI chatbots have the ability to help customers 24/7, process transactions almost instantaneously, and provide data-driven financial insights [64]. These chatbots help users perform activities such as balance checking, fund transfer, budget planning, and receiving investment advice, enabling consumers to rely less on traditional customer service [69]. Artificial intelligence chatbots are an evolution for Generation Z consumers who are used to instant self-service digital experiences; they drive improved engagement by providing human-like conversational experiences based on their spending habits and financial objectives [31]. More sophisticated AI systems track user behavior and provide proactive notifications about savings opportunities, spending ceilings, or possible fraud alerts [35]. However, issues such as trust, misinterpretation of complex queries, and data privacy concerns still hinder widespread use [63]. As artificial intelligence chatbots continue to evolve with deep learning and sentiment analysis when interacting with customers, they will serve as a linchpin in changing the dynamic of mobile banking, making the management of finance easier, more tailored, and user-oriented. Although the term blockchain technology mostly brings to mind cryptocurrencies, one of its uses is in mobile banking. The blockchain addresses security and fraud risks by providing a decentralized and transparent ledger system [72]. Banks and financial institutions have been experimenting with blockchain technology as a way to deliver faster, safer transactions with the potential to reduce overhead and increase data integrity. Smart contracts are self-executing contracts in which the terms of the agreement between buyer and seller are directly written into lines of code, allowing for more effective management of financial transactions and automation processes while reducing the need for intermediaries. The adoption of blockchain will become more common, and its influence on mobile banking will be enhanced [72], through which you can potentially offer users an experience that is faster, more reliable, and more transparent.

However, there are some hindrances during the development and deployment of AI and machine learning in your mobile bank. Data privacy issues, regulatory compliance, and algorithmic bias are significant obstacles facing financial institutions [14]. Data privacy is one of the challenges where AI can be of great help in managing customer trust by ensuring that AI relies on user data according to data protection laws and ethical principles [60]. This makes mobile banking the future. However, it will evolve, which means that the future of mobile banking will be even better as AI, machine learning, and other breakthrough technologies take a further step ahead. Gradually, AI-powered systems will be integrated in financial institutions to offer a fast, safe, and customized banking experience [1]. Due to an increase in customer expectations, banks need to work more on improving their AI and ensuring that it is secure and that AI decisions are transparent and explainable [69]. It is not the first, but mobile banking is also really smart, fast, and easy to use in a secure and unified environment that will provide billions of unbanked people with access to the future of digital financial services. As AI sets the pace for the progress in mobile banking,

it will provide smart, safe, and more convenient mobile banking solutions to each of its customers [62].

Digital banking has been transformed by Artificial Intelligence (AI) and Machine Learning (ML) that optimizes the user experience, including AI chatbots, fraud detection, customized financial recommendations, etc. [73]. AI-driven conversational bots, for instance, through Natural Language Processing (NLP), deliver real-time customer support while addressing queries, processing transactions, and providing personalized financial advice with low human involvement [74]. By offering an efficient and responsive banking experience, these virtual assistants enhance accessibility, which is particularly beneficial for Generation Z users who prioritize rapid and seamless digital interactions in mobile banking [75]. Furthermore, the use of ML algorithms improves fraud detection as they examine transaction trends and detect anomalies instantly, thus mitigating the chances of unauthorized transactions and cyber threats [4]. Machine learning-based fraud detection systems are fine-tuned according to user behavior, and AI models learn in real time to reduce false positives that ensure security [74]. In addition, AI-powered financial advising tools utilize predictive analytics to provide personalized investment advice, personalized savings plans, and budgeting advice [76]. The greater level of personalization available here can drive enhanced user engagement and financial well-being, particularly among Gen Z consumers who want data-driven digital first financial management solutions. A Step Towards Smarter Financial Solutions lowers the operability bar while establishing trust and loyalty through security, intelligence, and personalization in these mobile finance systems [74].

Blockchain technology and decentralized finance (DeFi) are revolutionizing the banking industry by providing transparent, secure, and efficient financial solutions that challenge existing banking systems [68]. DeFi stands for Decentralized Finance, which is a blockchain-based technology that allows transactions from one user to another to be made without an intermediate between the two parties, allowing users to lend, borrow, and invest in a decentralized system [77]. In contrast to traditional forms of banking, which rely on centralized institutions, blockchain-based banking solutions leverage smart contracts to facilitate automated transactions, resulting in trustless, tamper-free, and self-executing agreements [44]. These innovations promote financial inclusion by providing previously unbanked populations and tech-savvy Generation Z consumers with direct access to financial services, thus alleviating their dependence on traditional banks [29]. Furthermore, blockchain uses distributed ledger technology (DLT) to provide an immutable and verifiable basis for recording transactions. Incorporating cryptocurrencies such as Bitcoin and stablecoins enables cross-border transactions, providing Gen Z consumers with the option to traditional fiat-based mobile banking channels that offer lower transaction costs and greater financial independence [78]. But all things considered, right now, regulatory uncertainty and scalability issues are hindering the adoption on a larger scale. As blockchain banking solutions evolve, their integration with mobile banking platforms reimagines financial services in a decentralized, user-centric way. This increase in accessibility to financial services can significantly boost participation in the general economy, often by-passing traditional banking hurdles [79]. Mobile banking makes money managing easier and more efficient for individuals and businesses. This leads to greater financial access and helps communities grow economically [80]. Mobile banking helps reduce poverty and improve living standards, especially in underserved areas. It offers easy and affordable financial solutions [81]. Understanding what influences people to use mobile payment services is important for increasing financial inclusion. Key factors include perceived risk and self-confidence in using these services. By addressing these factors, we can help more people benefit from mobile payments [30]. To fully take advantage of contactless mobile

payment systems (MPS), it is important to understand how perceived risk, self-confidence, and personal traits affect a consumer's decision to use them. This is especially relevant when considering factors such as hygiene awareness [82]. The purpose of the study is to focus on perceived susceptibility, perceived severity, personal innovation, and knowledge about mobile payments. The research also considers how hygiene awareness influences these factors [83].

Using emerging technologies, including machine learning, big data analytics, and predictive algorithms, AI-driven personalized banking is changing the landscape of financial services and influencing user financial behaviors and savings habits [84]. When implemented on banking platforms, AI processes transaction history, spending patterns, and financial objectives to generate personalized recommendations, automated budgeting, and instantaneously accessible financial insights [85]. AI-powered tools can recommend a customized savings plan based on spending patterns, alert users regarding unnecessary expenditures, and perform micro-savings automation based on spending and income trends [86]. In addition, virtual financial assistants, such as chatbots, provide personalized investment recommendations, helping users optimize their wealth management strategies with minimal effort. AI and machine learning offer personalized insights to users and improve their access to financial concepts, leading to more informed decisions, particularly for highly digital Generation Z consumers who delight in digital-first solutions for managing their money [87]. However, issues associated with data privacy, algorithmic biases, and over-reliance on automation must be overcome for greater acceptance [88]. Data refers to the central driver for AI in personalizing user experience for specific recommendations and predictive analyzes. As AI continues to evolve, its role in personalized banking will further enhance financial well-being, offering; proactive, data-driven guidance to improve savings habits and long-term financial health of users [89].

Using predictive analytics, Big Data Analytics in banking transforms financial services by optimizing banking processes, enhancing customer experiences, and strengthening risk management. Using large amounts of transaction data, spending behavior, and behavioral patterns, organizations have identified customer demographics and created enhanced services that deter fraud and optimize financial offerings [90]. The predictive capability of big data analytics allows financial institutions to anticipate a customer's needs to the extent that proactive recommendations regarding general savings, credit, and investment opportunities based on their past behavior can be foreseen [87]. Furthermore, AI-powered models assess user interactions in real time to identify anomalies and raise the alarm for illegal behavior, improving fraud detection and security [91]. Predictive analytics help personalize banking interfaces in line with Generation Z consumer needs; they demand seamless and customized banking services. Personalization delivers features based on individual preferences and financial goals [92]. In addition, big data helps banks improve their lending decisions, credit evaluation, and risk management [93,94], making financial services more accessible, and reducing defaults [93]. Despite these advancements, issues related to data privacy, ethical artificial intelligence usage, and regulatory compliance continue to pose significant challenges in predictive banking analytics [69]. With the advancement of technology, big data-based banking solutions will further revolutionize financial services, driving customer engagement, operational efficiency, and risk mitigation [93].

Sentiment analysis on social media is of significant importance in mobile banking adoption, and platforms such as X (formerly Twitter), TikTok, and Instagram significantly impact how consumers perceive the digital services of financial institutions [64]. Banks and financial technology companies (fintech), for example, use the data generated by their users to analyze public sentiment guided by natural language processing (NLP) and machine learning to better understand what the market is about, what is concerning to users, and

new trends in financial technology [94,95]. Positive discussions over social media, influencers' endorsements, and viral trends can significantly increase mobile banking adoption. Generation Z consumers rely heavily on peer recommendations and online reviews to select financial products [76]. Research also indicates that negative sentiment, such as complaints about security breach incidents, subpar customer service, or hidden fees, may help turn potential users off and tarnish a brand's reputation [96]. Monitoring sentiment in real-time can help financial institutions preemptively address customer concerns, optimize digital offerings, and conduct targeted marketing campaigns to foster trust and transparency. However, fake reviews, misinformation, and algorithmic bias pose a threat to measuring public sentiment correctly [97]. As the impact of social networks on digital banking conversations continues to grow, sentiment analysis will serve as a critical tool for banks to tailor their offerings, foster trust, and drive increased adoption.

Eye tracking and UX research are revolutionizing the mobile banking experience, providing deep insight into user interaction, behavior, and cognition through banking apps [19]. For example, financial institutions can employ biometric research methods such as eye-tracking technology, analysis of facial expressions, and pupillometry to measure visual attention, navigation patterns, and decision-making processes to optimize the design of the application [98,99]. Eye-tracking studies show which interface elements capture attention the most, how quickly users locate key features (e.g., balance checks, transfers), and where barriers to usability exist (e.g., confusing layouts, points of friction in transaction flows) [74]. Banks can leverage UX research to develop customized, effective, and attractive interfaces for Gen Z consumers who demand seamless and intuitive digital experiences [4], ultimately improving engagement and decreasing drop-off rates. Furthermore, AI-based heatmaps can be enhanced by including biometric data to better understand mobile banking security features such as fingerprint or facial recognition [76]. Nonetheless, issues in data privacy, ethical concerns, and the high cost of biometric research need to be addressed for mass adoption [83]. As UX research progresses, eye-tracking technology significantly improves the usability of mobile banking by making banking more accessible and easier to use [80].

Regulatory compliance is challenging, as financial institutions increasingly embrace AI-based models for KYC or AML [63]. These challenges have forced compliance functions to consider automated and AI-driven solutions to improve key areas in efficiency, operational costs, and ongoing adaptability to dynamic financial crime strategies. AI-based compliance models use machine learning and natural language processing (NLP) systems to make sense of the big data attached to the customer, identify problematic behaviors in development, and aim for compliance with regulatory adherence [11]. For example, AI facilitates risk profiling by identifying aberrant behaviors indicative of fraudulent activity or money laundering relevant to citizens or institutions flagged as suspects, thus producing lower false positive rates than traditional rules-based systems [83]. Furthermore, the blockchain implementation of KYC frameworks maintains secure, immutable digital identities, expedites cross-border verification, and minimizes redundancies [2]. However, complete adoption and penetration of AI in healthcare faces several hurdles, including data privacy concerns, regulatory fragmentation, and potential AI biases [100]. Further research can investigate how AI-based compliance metrics can help improve transparency, address these challenges, and enhance regulatory agility, which encourages continual adherence to future innovations in FinTech within the framework of global financial regulations, while decreasing risk factors and ensuring speed and security of digital banking.

The development of biometric authentication, which provides a seamless and secure means of verifying users' identity, has been a pivotal game changer for mobile banking security measures [84]. Technological advances that include fingerprint scanning, facial

recognition, and voice authentication use unique physical and behavioral characteristics to protect against fraud and unauthorized access [86]. Fingerprint scanning, a very prevalent form of biometric identification, provides a quick and reliable means of authenticating transactions and replaces the input of a conventional PIN and password, which are susceptible to compromises. Likewise, facial recognition is another innovative application of AI technology that analyzes facial features using advanced AI algorithms, and it is considered to be more secure as it reduces the probability of identity theft and spoofing attacks [87]. This approach works well with Generation Z consumers, who value security and convenience with digital interactions. In Contrast, voice authentication is emerging as an increasingly popular hands-free solution that follows secure banking transactions through the use of vocal patterns and speech recognition technology [88]. The use of multi-factor biometric authentication in mobile banking platforms minimizes the risk of fraud and increases the accessibility for users. However, addressing issues such as privacy threats, data storage vulnerabilities, and potential biases in AI-based recognition systems is an important field of active research and advancement [89]. With the ongoing evolution of biometric authentication, its incorporation into blockchain and AI-based fraud detection systems could further enhance security and thus ensure a more secure and efficient mobile banking experience [69]. With the advent of 5G and edge computing, mobile banking is set to transform with faster transaction speeds, lower latency, and improved overall system performance [69]. The Ultra-low latency and high data transfer speeds afforded by 5G networks facilitate real-time processing of financial transactions and minimize delays seen in previous generations of networks [90]. This is especially advantageous for mobile banking users who are involved in a variety of tasks, including instant payments, stock trading, and blockchain transactions, where even a millisecond can make a dramatic difference in financial results. Edge computing complements 5G by performing data processing closer to the user instead of relying on centralized cloud servers, which experience congestion and security issues [91]. Because it does data processing at the edge, it enables banking applications to provide better reliability and shorter response times across locations compared to experiencing poor service from assets far away and experiencing unreliable network connectivity [92]. With Gen Z's need for seamless, always-on mobile banking experiences, these technologies will enable a frictionless experience when interacting with digital financial services. Also, the integration of 5G and AI-powered fraud detection adds another layer of security by allowing transactions to be analyzed at the edge of the network and in real time [94]. Mobile banking innovations are also expected to grow even faster with the help of 5G and edge computing, which can scale fintech solutions, support high-frequency transactions, and build a resilient digital banking infrastructure.

In a more advanced version of the usage of BaaS and embedded finance usage, the integration of banking services into third-party platforms improves accessibility and user convenience [64]. Embedded finance allows non-financial firms such as e-commerce platforms, ride-sharing applications, and social media networks to integrate services such as payments, lending, and insurance into their ecosystems [93]. This allows users to avoid bouncing between various applications and results in a more streamlined digital experience. Embedded payment systems: An example of faster payment is companies such as Uber or Shopify, which integrate payment systems into their platforms and enable users to perform transactions without the need for the traditional banking interface [96]. In the same way that BaaS allows fintech companies, retailers, and other enterprises to offer banking services using the licensed infrastructure of financial institutions [97]. With API-driven banking, third-party platforms can offer customers a digital wallet, credit services, and investment tools without constructing their banking operations from the ground up. This model opens financial access for these new consumers, especially Generation Z, who favor app-based

financial interactions over traditional banking services [19]. In addition, BaaS promotes innovation in financial services as a result of faster product deployment and increased competition. However, data security, regulatory compliance, and financial stability concerns persist even as these models scale. Embedded finance and Banking as a Service (BaaS) redefine the future of mobile banking and the way consumers interact with financial services by blending traditional banking models and digital ecosystems [99].

Users desire secure, transparent, and compliant financial services, which leads to issue of digital trust and privacy that play a vital role in the adoption of mobile banking. Protecting data security remains one of the top priorities, and banks are using encryption, multi-factor authentication, and AI-driven fraud detection to counter cyberattacks [74]. However, increasing concerns related to data breaches and identity theft, particularly among Generation Z consumers, have increased skepticism of digital banking [4]. User trust is inherently connected to responsibility data collection, compliance with privacy regulations such as the General Data Protection Regulation (GDPR) and the California Consumer Privacy Act (CCPA), both of which establish robust safeguards and allow users more control over their data [76]. Regulatory measures take steps towards improving consumer confidence. However, we remain in balancing security with user convenience, navigate data-sharing risks in open banking, and ensuring accountability of third parties in Banking-as-a-Service (BaaS) ecosystems [80]. A privacy-first framework, strong cybersecurity, and open communication will be necessary to drive adoption, creating a digital banking landscape that balances subtlety and transparency, protecting but never compromising the consumer's safety and agency.

With a rewards system, leaderboards, and interactive features, gamification has proven to be an effective tactic in mobile banking to increase user engagement, retention, and financial literacy. By incorporating mechanisms inspired by game design, financial institutions create opportunities for individuals to actively participate in financial management, which is especially appealing to the younger generation [77]. Reward mechanisms such as cash-back rewards, achievement milestones, and loyalty points promote regular use of the app and reinforce positive saving habits [73]. Likewise, the leaderboard elements create a social comparison that fosters social engagement and competition. It enables users to compare their savings progress, spending habits, or investment performance with their peers, encouraging them to reach their financial goals. In addition, interactive elements such as AI-powered financial coaching, savings challenges, and goal-setting tools offer personalized engagement, ensuring that users remain actively engaged in managing their finances [78]. Gamification techniques not only increase customer retention, but also help them better manage money and improve their financial literacy. However, there are challenges, particularly in reconciling engagement with ethical questions, such as not monetizing in a way that encourages damaging financial behavior through competitive features. Gamification will be the key to creating long-term user loyalty and adopting digital finance as mobile banking continues to develop [76]. Mobile banking is also essential for financial inclusion, allowing unbanked populations and low-income users to access affordable, convenient, and secure financial services. According to [77], about 100 billion adults are unbanked, with traditional systems designed for the Western world often excluding individuals based on the geographical divide of entrepreneurs (if they are not in or near an urban center), documentation problem (many people do not have enough identity documents to satisfy banks that make offerings), or service fees/ticket sizes that they left out. Mobile banking fills this gap by providing cheap digital accounts, mobile wallets, and micro-lending facilities that allow users to save, transfer, and access credit without needing a physical bank branch [44]. Ref. [29] states that USSD-based banking, biometric authentication, AI-driven financial assistance, etc., opens up accessibility, especially for those with low literacy and

digital skills. Mobile banking also encourages economic empowerment by allowing small businesses and entrepreneurs to receive digital payments, access microfinance, and enter the global digital economy [78]. However, Internet connectivity issues, cybersecurity risks, and regulatory barriers can still hinder widespread adoption in some areas [44].

2.2.2. Influence of Social Influence on Mobile Banking Adoption

Regarding the adoption of technology, social influence refers to how the beliefs and/or actions of other people might convince someone to use a particular technology [101]. Since social influence does not imply the coercive or normative elements ingrained in the subjective norm, it is preferred in this study over a related construct of subjective norm and social class, which is the perceived social pressure to adopt technology, as derived from the Theory of Planned Behavior. In this study, social influence is defined as the impact of one's social network, which includes friends, family, and coworkers, on one's decision to use or not utilize online banking. Although several studies have shown the beneficial effects of social influence on Internet banking adoption [1,102], empirical tests of the relationship between social influence and actual internet banking adoption in a less studied context of generation Z consumers, with financial inclusion being a challenge, have not yet been conducted. Social influence is one of the main elements that influence young people's decisions to use mobile banking. This perception and behavior are influenced by social and cultural norms, peer recommendations, and other societal factors [103]. One of the most powerful reasons to convince someone to use mobile banking is the favorable word-of-mouth recommendations from friends, family, or opinion leaders. The attitudes and beliefs that a large part of society or the general public develops about technology and money also impact humans' tendency to use mobile banking solutions [22]. If social influence is recognized as an essential factor in new marketing strategies, then it is likely that more people from different social groups will use mobile banking applications. Social impact leads to pressure from other parties to take action and to consultation among people about adopting new technology [104]. Social influence refers to a person's consideration of what others think about their needs regarding a specific system [18]. The social impact of the use of mobile banking use is in line with Van-Katesh's theory, that is, if someone is motivated by the opinion of others and the pressure in certain social groups, that can have an impact and influence the experience of other people with them, most will use the mobile banking system. Based on such findings, social influence is believed to influence an individual's intention to buy or use any new service or product, and many studies also report that, in addition to actual behavior, their behavioral intentions are influenced by social influence, including mobile money banking [32]. According to [32], social influence is considered a hidden incentive to encourage people to adapt to technology. For the rest, this caused friends and family, or technology as a service they could depend on, or a technology they could use safely. This paper established the idea and reasoning behind applying social influence to the adoption of technology. However, different studies supported the assumption that social influence is not yet mandatory for other users to adopt [82].

Ref. [40] used social influence to represent social elements in MPCU, images in IDT, and subjective norms in TRA, TAM2, TPB/DTPB, and CTAM-TPB. According to the definitions, social influence is the degree to which an individual perceives that important others believe they should use the technology. Using data from an empirical study of 158 customers of a leading Malaysian bank, ref. [105] found that people around an individual significantly affected their mobile banking use. Similarly, ref. [106] reported that friends and family played a role in how individuals decided to adopt mobile commerce services. In addition, ref. [105] demonstrated that the perceived image was a key factor for people who were ready to use mobile banking. ref. [107] presented empirical evidence that subjective norms

have a major effect. The above might explain why ref. [108] argued that mobile commerce users are also participants in social networks and technology providers. Social influence and mobile devices connected to social media are important in shaping how consumers view and adopt mobile commerce [109]. This shows that financial institutions should use referral programs, peer endorsements, and social media marketing campaigns to encourage more people to use mobile banking [110].

In the UTAUT model, social influence is “the extent to which an individual perceives that important others believe he or she should use the new system” [33]. According to [3], social influence in the context of mobile banking could be described as the effect of a customer’s social environment (e.g., family, friends, opinionated leaders, reference groups, and coworkers) on the adoption of mobile banking. Therefore, customers’ knowledge and intentions toward technology can be heavily influenced by the information and encouragement that those around them provide [36]. Social influence as a factor shaping behavior intention was selected based on prior research that has demonstrated how social influence impacts consumers’ willingness to use online banking channels.

2.2.3. Influence of Compatibility on Mobile Banking Adoption

As ref. [43] indicated, compatibility refers to the degree to which an innovation is perceived to be consistent with the existing values and past experiences of potential adopters. Elements that influence people’s character and perspectives include social norms and objects that shape their longevity and the compatibility of their disposition with social structures [58]. The Empirical data of [2] reveal that social norms such as those of family, friends, and others directly affect the adoption of mobile banking. Consequently, compatibility is identified as a significant factor influencing the usage of mobile banking [60]. In addition, as [5] points out, reference groups can directly and indirectly influence individuals’ attitudes and behaviors. Perceived compatibility with lifestyle is a key antecedent of both attitude and intention to use mobile banking [5]. Furthermore, according to [64], lifestyle congruence plays a crucial role in shaping users’ interest in technology-oriented services [65].

Compatibility is an input driver that determines the attitude and acceptance of the customer of online banking [40]. And it is considered a key factor in the spread of innovation. According to [45], compatibility refers to ‘the degree to which mobile banking services are consistent with the current needs and way of life of the customer.’ According to studies, the absence of traditional channels in their portfolio due to wireless and mobile channels ultimately leads to the failure of more than two-thirds of financial transaction services to meet customer demands [109]. Furthermore, [71] argues that when the level of compliance with the banking standard is high, the probability that the technology will be developed and accepted will increase. This would also indicate that customers’ needs and desires would be more compatible with mobile banking, which would ultimately lead to its higher adoption. According to the study conducted by [110], compatibility significantly affects user intention in different applications, while another study by [10] found compatibility to have a substantial impact on PU and PEOU. If a bank’s communication channel is not aligned with the needs of its customers, it is more likely to fail in providing services, and users will be discouraged from using it. A technology consistent with the beliefs and lifestyle of the user can accelerate the adoption rate of that technology [64]. In many studies, experimental evidence showed that the most significant driving factor in the adoption of mobile banking was compatibility [111]. Similar findings were found when ref. [95] examined the adoption of M-banking among younger customers in England. Compatibility allows innovation to be seen more broadly, increasing the likelihood of a technology being adopted [103]. According to [62], compatibility is believed to be one

of the elements determining PEOU and PU, and significantly influences the adoption of M-banking. Therefore, people's opinions about using M-banking are more positive and compatible with their previous bank accounts [34]. Furthermore, ref. [69] suggests that a positive correlation between compatibility and acceptance might be related to a reduction in risk and uncertainty. However, PEOU and PU are used in this study to assess how compatibility affects attitude. The current research demonstrates that customers are more likely to stick with mobile banking if it aligns with their beliefs, routines, and way of life.

2.2.4. Influence of Self-Efficacy on Mobile Banking Adoption

Self-efficacy is the development of the ability, belief, knowledge, and skills to tolerate and accept services. Ref. [111] confirmed that self-efficacy significantly influenced the acceptance of technology at the individual level. Self-efficacy, a central construct of the social cognitive theory, is a belief in one's competence to perform a specific behavior in multiple circumstances. Perceived self-efficacy is the level of confidence that respondents have about their ability, expertise, or knowledge to perform a task [100]. Individuals with low self-efficacy, by contrast, will be less likely to adopt new technologies than individuals with high self-efficacy. Based on [95], "performance accomplishments, vicarious experience, verbal persuasion, and physiological states" are other sources of self-efficacy. It also might be concerned with social behaviors and cognitive processes that the individual perceives inside and outside experiences of his perceived self that influence decisions concerning an event. Self-efficacy is believed to have multiple outcomes in achievement contexts [111]. In other words, a person who has a higher self-efficacy will be more motivated to exert different levels of force to complete a task [16]. In a few studies [103], self-efficacy was revealed to predict the adoption of mobile banking services. Consistent with [81], similarly, the study identified the role of computer self-efficacy as a mediator element in IT investments regarding post-adoptive usage behavior, echoing the previous findings of [98], who studied the relationship between self-efficacy (post-adoptive usage), the ethical judgment of students, and the ethical judgment of the Internet. Self-efficacy and behavioral intention were mediated by ethical judgment on the Internet as a result. The perceived ease of use and the perceived self-efficacy in numerous studies have been shown to correlate [84]. According to [30], perceived self-efficacy may account for a substantial part of perceived ease of use.

Second only to computer self-efficacy in a study by [3] predicting the intention to use mobile banking in India. The model used in the study included self-efficacy of the computer, perceived financial cost, trust, security, social influence, and self-efficacy. Data collected using questionnaires filled out by 855 customers of Indian commercial, public, cooperative, and foreign banks. Computer self-efficacy is a belief in one's computer skills. The report notes that banks should focus on helping customers use mobile banking services, as they expect assistance and demos. The study found that the intention to use mobile banking is significantly influenced by computer self-efficacy. Security was the most significant factor, followed by computer self-efficacy in the second place, perceived ease of use in third place, and perceived financial cost in the last place. Ref. [30] found that self-efficacy in mobile banking greatly enhances attitudes, perceived usefulness, and perceived ease of use, all of which are critical elements in the uptake and use of mobile banking. The study's findings suggested that regulators and bank management should develop training curricula to educate consumers about the latest developments in mobile banking technology. The ease of use, perceived usefulness, and risk were the mediating variables in research by [79] on the impact of self-efficacy on the intention of the customer to use the BRImo application, a mobile banking app from BRI Bank. Customers with a sufficient degree of self-efficacy are more likely to find mobile banking easier, more practical, and less hazardous, as the study indicated that self-efficacy was a critical predictor of perceived

risk, reported ease of use, and perceived usefulness. The study found that the intention to use mobile banking was predicted by self-efficacy. Men's perceptions of mobile banking self-efficacy in terms of perceived utility and simplicity of use are negligible, whereas women's are more significant [2]. The technical self-efficacy of men exceeds that of women, and thus, their opinions regarding mobile banking's utility and usability of mobile banking are neither hit nor miss [3]. The necessary conditions for this are the informative training conducted to prepare them to use the new technologies based on the implementation approval mechanism [1].

2.2.5. Influence of the Cost of Usage on Mobile Banking Adoption

The perceived costs involve the financial, time and effort-related costs incurred while deploying and using mobile banking services. According to [22], people's intentions to use mobile banking applications are strongly and significantly affected by perceived cost. The price value was one of the main drivers that affected the behavioral intention to use mobile banking [100]. Price-value perception is the extent to which users believe that the benefits of the technology outweigh any additional costs [4]. This means that the consumer will assess whether the perceived benefits are worth the extra costs. Ref. [83] found that perceived financial cost greatly influences an employee's tendency to use mobile banking. In a similar vein, Ref. [14] found that perceived cost significantly influenced Thai consumers' adoption of mobile banking and mobile payment services. As per [69], the factors affecting mobile banking client usage include perceived risk, perceived utility, perceived cost, and compatibility. The results also support the mediation theory that the influence of various consumer perceptions on consumers' intention to use mobile banking is mediated by their attitudes. Ref. [65] asserts that several factors have a substantial impact on customers' attitudes towards mobile banking usage, which in turn affects their desire to use it. These criteria also include relative advantage, simplicity of use, perceived cost, perceived danger, perceived interaction, and perceived utility. The behavioral willingness to use mobile banking is influenced by the perceived financial cost [79].

Utilizing technology outside of the customer's context may result in additional financial costs compared to organizational seating. Therefore, Customers could compare the service involved in the use of new technology with the associated costs on a cognitive manner [1]. In other words, consumers will be more eager to embrace new technology if the value of the price is higher. Thus, Customers must believe that the use of technology is more beneficial than the money spent [2]. More significantly, the resources and facilities needed to operate mobile banking (such as smartphones, Wi-Fi, and 4G services) may incur additional costs for users, increasing the significance of the value of the price in the conceptual model [3]. In keeping with this premise, ref. [11] claims that financial limitations have a significant influence on the consumers' propensity to use mobile banking. According to [12], one of the factors that positively promote the adoption of mobile banking is the reduced cost of financial transactions that mobile banking facilitates. On the other hand, the cost of mobile services was determined to be the most detrimental factor. The relationship between price value and service value has been examined and contested in relevant research on online banking channels. For example, ref. [13] provided empirical evidence of the importance of perceived value in influencing the inclination of customers to use Internet banking. The adoption of Internet banking is also acknowledged to be significantly influenced by monetary value, especially for prospective users who are more inclined to embrace this channel over a year [10].

3. Research Methodology

3.1. Research Design

According to [20], a research design is a framework or procedural approach used for data collection and analysis of a research subject. It is the approach to the study topic from a methodological point of view. Every research design has scope, characteristics, advantages, and disadvantages. From a research standpoint, a research project study design is made to answer the study's purpose, objective, and research questions (hypotheses). It is the primary factor that determines the findings of a research project. Given how crucial study design is for the final result of a research process, it is critical to recognize the many types of research study designs and their advantages, disadvantages, and commonalities. A survey design was used in the current investigation. Cross-sectional and longitudinal designs are the two main categories of survey designs. The frequency of data collection is the difference between these two designs. To collect data at a single point in time, the current study used a cross-sectional survey methodology.

3.2. Data Collection

This research examined the adoption of mobile banking in traditional banks such as Bank of America and Chase and in online only banks such as Chime and Varo. Although both segments have mobile banking solutions, they are starkly different in terms of regulatory environments, brand trust, digital, and customer experience. This is a result of research interest to investigate the global drivers of mobile banking behavior among Generation Z, based on the type of institution. However, it is thoroughly documented that the type of bank has the ability to influence user perceptions, in particular those of trust, compatibility, and perceived risk. A non-probability convenience sampling method was used, with age stratification added in order to get a sufficient number of representatives from various subgroups of Generation Z (18–29 years). Social media platforms and online survey websites (e.g., Reddit, university websites, Instagram), which are typically used by Gen Z, were used to invite participants. Although an attempt was made to distribute the survey between geographic regions and educational levels, full randomization was not feasible due to practical limitations in the form of access restrictions and bias in voluntary responses. The results are therefore likely best viewed as representative of digitally connected, higher-education-exposed Gen Z consumers, rather than all U.S. Gen Z members. The researchers gather data after finishing the laborious sampling design, sample selection, and questionnaire creation processes. To assess the consistency of the results, 50 questionnaires are first used in the pilot trials. Since the result is satisfactory, the researchers begin gathering the final data. Using emails and social networks, respondents are selected at random while traveling to various locations throughout the United States. The interviewees' ages, occupations, income levels, and educational backgrounds vary. Using a structured questionnaire survey, the researcher gathered responses from mobile banking users and non-users. Respondents are given the questionnaires, and after discussing the questions with the researchers, the participants complete the forms and send them back.

4. Findings

Demographic Profile

In terms of demographics, Table 1 shows that there was a nearly-equal balance between the proportion of male respondents (51.1%) and female respondents (48.9%). Most of the respondents (53.2%) were in the age group of 21–25 years, and (22.7%) in the age group of 18–20 years. This indicates that the majority of respondents are relatively young adults, with a particularly large concentration in their mid to late 20 s. Regarding their level of education, 46.8% hold a certificate or diploma, and 27.6% have completed secondary education. A slightly lower percentage (12.7%) hold a bachelor's degree, while 7.0%

have postgraduate qualifications (master's or PhD). Only 5.9% have completed primary education, suggesting that most of the respondents have some form of advanced education beyond high school. In terms of employment status, the majority (50.8%) are students, while 23.2% are self-employed, 17.6% are formally employed, and 8.4% are unemployed. With such a large share of students among the participants, many are likely still affiliated with academic institutions. Finally, respondents reported high mobile banking usage, with 76.5% having used the service previously and only 23.5% not. This implies a high degree of digital financial adoption among the sample group. Overall, the demographic is exceptionally young, educated, and mobile banking-savvy, although many remain either full-time or part-time students.

Table 1. Demographic Profile of the Respondents.

Variable		Frequency	Percentage (%)
Gender	Male	189	51.1
	Female	181	48.9
Age	18–20	84	22.7
	21–25 years	89	24.1
	25–29 years	197	53.2
Educational level	Primary	22	5.9
	Secondary	102	27.6
	Certificate/Diploma	173	46.8
	Bachelor Degree	47	12.7
	PostGrad (Master's/PhD)	26	7.0
Employment status	Student	188	50.8
	Unemployed	31	8.4
	Self-employed	86	23.2
	Formally employed	65	17.6
Used M-banking before	Yes	283	76.5
	No	87	23.5

5. Descriptive Statistics

5.1. Social Influence

Table 2 presents the descriptive statistics for the social influence on the adoption of mobile banking, measured on a five-point Likert scale. The results indicate that social support has a strong effect on users' decision-making processes. The statement "People I consider essential endorse my usage of mobile banking" received a high mean score ($M = 4.14$, $SD = 0.78$), suggesting that users believe those they consider important strongly support their mobile banking usage. Similarly, the item "My social status will erode if I do not adopt mobile banking" was rated relatively high ($M = 4.08$, $SD = 1.07$), implying that users might feel social pressure to conform to digital financial norms. On the other hand, the statement "I use mobile banking because it is fashionable" scored somewhat lower ($M = 3.77$, $SD = 1.09$), suggesting that although trends influence adoption, they are not the dominant motivating factor. The highest mean score ($M = 4.28$, $SD = 0.98$) was observed for the item. "My peers have embraced mobile banking because I use it", indicating that users may see themselves as influencers within their social circles. Overall, the findings highlight the significant role of social influence—particularly through recommendations from important others, such as family, friends, and peers—in encouraging the adoption of mobile banking services.

Table 2. Social Influence.

Statement	M	SD
People I consider essential endorse my usage of mobile banking.	4.14	0.78
My social status will erode if I do not adopt mobile banking.	4.08	1.07
I use mobile banking because it is fashionable.	3.77	1.09
My peers have embraced mobile banking because I use it.	4.28	0.98

5.1.1. Compatibility

The perceptions of the respondents about mobile banking being convenient for their lifestyle and financial management practices are shown in Table 3. The results indicate a generally positive reception, with means ranging from 3.81 to 4.14 on a 5-point Likert scale. The participants agreed the most on “I am comfortable using mobile banking because it is similar to the other digital services I already use” ($M = 4.14$, $SD = 1.01$), which indicates that in line with their previous experience, the users were more comfortable with different digital platforms, including mobile banking. Likewise, the statement “Using mobile banking is consistent with my present banking practices” obtained a mean score of 4.01 ($SD = 1.07$), reflecting the users’ belief that mobile banking is largely in congruence with their current financial behaviors. Similarly, “Mobile banking fits well with my lifestyle and daily activities” received a good rating ($M = 4.00$, $SD = 0.79$), suggesting its convenience and integration into daily life. “Mobile banking is suitable for how I prefer to handle my funds,” which had the lowest mean score ($M = 3.81$, $SD = 1.11$), suggesting a variability in mobile banking usage depending on the personality of the mobile banking user. This moderately high standard deviation, especially for the last two statements, also shows that while for many users, mobile banking is compatible, individual differences in cultural and financial management approaches can significantly affect perceptions.

Table 3. Compatibility.

Statement	M	SD
Mobile banking works nicely with my lifestyle and everyday activities.	4.00	0.79
Using mobile banking is consistent with my present banking practices.	4.01	1.07
Mobile banking is suitable with how I prefer to handle my funds.	3.81	1.11
I feel at ease using mobile banking because it is similar to the other digital services I use.	4.14	1.01

5.1.2. Self-Efficacy

The self-efficacy with respect to mobile banking of respondents obtained on a 5-point Likert scale is shared in Table 4. The findings show a generally good view of the mobile banking capability. The statement “I can easily browse or complete transactions using mobile banking apps” received the highest mean score ($M = 4.21$, $SD = 0.96$), indicating that most of the respondents believe they would be able to use mobile banking applications to explore and conduct business. In a related finding, the statement “It is easy to do what I like to do” was rated high ($M = 4.01$, $SD = 1.10$), which further supported the view that mobile banking is easy to use. For mobile banking, respondents also show a good understanding ($M = 3.93$, $SD = 0.91$) of the statement “I think I have enough understanding to use mobile banking.” However, it should be noted that the level of self-efficacy was slightly lower, with the statement “It is simple to become proficient in Mobile Banking” receiving the lowest mean of 3.81 ($SD = 1.11$). With relatively large standard deviations, especially for the last two statements, it appears that not all users find mobile banking

intuitively comprehensible. In general, users were confident in using mobile banking, but some users were handicapped and needed help.

Table 4. Self-efficacy.

Statement	M	SD
I have sufficient understanding to utilise mobile banking.	3.93	0.91
It is simple to do what I want to accomplish.	4.01	1.10
It is simple to become proficient in Mobile Banking.	3.81	1.11
I can simply explore and finish transactions with mobile banking apps.	4.21	0.96

5.1.3. Cost of Usage

Table 5 presents information on the opinions of the respondents on mobile banking with respect to cost, using a five-point Likert scale. There is a consensus on the negative association between mobile banking and considerable cost. The statement that received the highest mean score ($M = 4.35$, $SD = 1.05$) was “Hidden levies and unexpected costs make mobile banking expensive,” indicating that many see mobile banking as costly. In the same vein, “The cost of internet or mobile data for mobile banking is high” was rated high, with a mean score of 4.14 ($SD = 0.92$), suggesting that users believe that data are among the significant costs associated with mobile banking. Furthermore, the argument “Mobile banking has high transaction costs” highly rated with a mean of 4.08 ($SD = 0.74$), corroborating the idea that users take transaction fees into account as an expense. Finally, the statement “Mobile banking is more expensive than conventional banking options” received a mean score of 4.03 ($SD = 0.95$), suggesting that most respondents agree that mobile banking is more expensive than traditional banking services. Although the means represent the core of opinion about the fact that there are hidden costs in fact and the standard deviations appear high, indicative views of diverse opinions, in terms of the high means reached, a large number of people believed that the mobile banking system also comes with a high cost, given mainly by hidden fees, transaction charges, and internet or mobile data expense.

Table 5. Cost of Usage.

Statement	M	SD
Mobile banking has significant transaction costs.	4.08	0.74
The cost of internet or mobile data for mobile banking is high.	4.14	0.92
Mobile banking has a greater total cost than traditional banking options.	4.03	0.95
Hidden levies and unexpected costs make mobile banking expensive.	4.35	1.05

5.1.4. Mobile Banking Adoption

Table 6 presents the data related to the adoption of mobile banking measured through a five-point Likert system, as perceived by respondents. The results indicate a generally high engagement with mobile banking services. The highest mean score ($M = 4.41$, $SD = 1.00$) is associated with the statement “I want to learn more about mobile banking services,” suggesting that users are significantly interested in learning more about mobile banking services and functions. Moreover, the statement “I routinely utilize mobile banking services” achieved a high score of 4.26 ($SD = 0.77$), indicating that many respondents frequently use mobile banking for financial activities. The mean scores were slightly lower for the statement “I have used mobile banking in the last month,” 4.00 ($SD = 1.04$), which suggests that while many users have used mobile banking recently, the usage may differ. Indeed,

the lowest mean score ($M = 3.89$, $SD = 1.05$) was seen for the statement, “I know about the latest innovations and changes in mobile banking.” This reflects that while the user is involved in mobile banking, not all users are up to date with new functionality and updates. This one, in particular, for the latter two statements, shows some variability in awareness and recent usage. In general, it shows a high acceptance towards the usage of mobile banking services, which consumers were consistent through their usage & ready to know more about how the new mobile banking services work.

Table 6. Mobile Banking Adoption.

Statement	M	SD
I routinely utilize mobile banking services.	4.26	0.77
I have used mobile banking within the previous month.	4.00	1.04
I am aware of the most recent innovations and changes in mobile banking.	3.89	1.05
I want to learn more about mobile banking services.	4.41	1.00

5.2. Regression Analysis

Table 7 model summary signifies a predictiveness between the independent variables (Cost of Usage, Compatibility, Social Influence, Self-Efficacy) and mobile banking adoption. The Pearson correlation coefficient ($R = 0.988$) indicates a very high positive association, which shows that the predictor variables significantly change mobile banking adoption. The coefficient of determination ($R^2 = 0.976$) suggests that the model explains 97.6% of the variance in mobile banking adoption, confirming its high explanatory power. The adjusted R^2 value remains constant at 0.976, demonstrating the strength of the model and indicating a minimal risk of overfitting. Also, the standard error of estimate (0.11692) is low, suggesting that the predictions of the model are well matched to the observed data. In conclusion, these findings indicate that Cost of Usage, Compatibility, Social Influence, and Self-Efficacy are critical determinants of the adoption of mobile banking and are followed through a model that allows for exceptionally accurate predictions.

Table 7. Model Summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.988 ^a	0.976	0.976	0.11692

^a Predictors: (Constant), CoU, Comp, SI, SE.

Table 7 summarizes the regression model statistics for the study.

Table 8 presents the ANOVA results used to assess the significance of the regression model for mobile banking adoption (MBA). The overall regression equation was significant for MBA ($F(2, 296) = 61.665$, $p < 0.001$). The model for the regression (explained variance) has a Sum of Squares of 204.327, $df = 4$, and the residual (unexplained variance) is 4.990, $df = 365$. This means the predictor variables cost of usage (CoU), compatibility (Comp), social influence (SI), and self-efficacy (SE) explain the most part (209.317) of the total variance. In addition, the F-statistic ($F = 3736.694$) is very high, which shows a strong relationship between independent variables and mobile banking adoption. The p -value (Sig. = 0.000) provides evidence that the model is statistically significant at any level of confidence commonly used (ie 0.05 or 0.01). The implication is that at least one of the predictor variables can help explain variations in mobile banking adoption. In summary, the ANOVA output supports the model, indicating that the cost of usage, Compatibility, Social Influence, and Self-Efficacy are all significant factors impacting mobile banking adoption. The minimal residual variance shows that the model fits the data extremely well.

Table 8. ANOVA ^a.

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	204.327	4	51.082	3736.694	0.000 ^b
	Residual	4.990	365	0.014	–	–
	Total	209.317	369	–	–	–

^a Dependent Variable: MBA. ^b Predictors: (Constant), CoU, Comp, SI, SE.

Table 8 presents the ANOVA results used to assess the significance of the regression model.

Table 9 presents the results of the regression analysis, indicating the relationships between mobile banking adoption (MBA) and its predictor variables. The regression analysis indicates the determinants of mobile banking adoption. The negative constant term (-0.548 , $p = 0.000$) indicates that mobile banking adoption would be negative when predictor variables do not exist. Still, as shown above, this does not have a statistical interpretation but rather a mathematical artifact. When looking at independent variables, social influence ($B = 0.642$, $p = 0.000$) has the most significant positive effect, suggesting that societal pressure, peer recommendations, and social norms are powerful drivers of mobile banking adoption. In a parallel manner, the cost of usage ($B = 0.857$, $p = 0.000$) is the most significant predictor, indicating that while users may worry about the costs involved in mobile banking, other factors are driving its adoption. In fact, self-efficacy ($B = -0.343$, $p = 0.000$) negatively influences the adoption of mobile banking, which means that little content is relevant. Hence, those who play to bring phobia in mobile banking in the general fact domain despite not appearing related, it is likely due to being related to three uncertainties, such as fear of security and cost of transactions. However, compatibility ($B = -0.028$, $p = 0.615$) has no significant influence on mobile banking adoption, showing that the compatibility of mobile banking with users' existing habits and the technological environment of users does not play an essential role in mobile banking adoption. The overall perceived effects that appeared for the comparison between social influence and cost of usage are the thrust of the exceptional factor of significant penetration for the adoption of mobile banking. In contrast, self-efficacy appeared as a barrier to mobile banking adoption rather than a driving force, and, in contrast, compatibility does not provide a significant verdict on adoption behavior. These findings underscore the role of peer effects and financial incentives on users' adoption decisions.

Table 9. Coefficients ^a.

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1 ^a	(Constant)	−0.548	0.041		−13.299	0.000
	SI	0.642	0.026	0.643	25.154	0.000
	Comp	−0.028	0.055	−0.028	−0.503	0.615
	SE	−0.343	0.067	−0.339	−5.149	0.000
	CoU	0.857	0.024	0.722	35.863	0.000

^a Dependent Variable: MBA.

Table 9 presents the results of the regression analysis, showing the relationship between mobile banking adoption and the studied predictors.

5.3. Discussions

This study explored predictors of mobile banking uptake in terms of self-efficacy, social influence, compatibility, and cost of usage as determinants. Thus, the findings of the statistical analyses, such as descriptive statistics, regression analysis, ANOVA, and correlation analysis, shall result in understanding how this affects mobile banking adoption in terms of consumer behavior. This section critically interprets these findings and relates them to previous studies on mobile banking adoption. The expected self-efficacy was measured, in other words, whether individuals believe they will be able to use mobile banking services confidently. Descriptive analysis and mean scores indicate that the majority of respondents agree to varying degrees that they feel proficient in undertaking mobile banking, with the highest mean value ($M = 4.21$, $SD = 0.96$). As shown in Table 9, the regression revealed a negative and significant relationship between self-efficacy and mobile banking adoption ($B = -0.343$, $p = 0.000$). This is certainly surprising because self-efficacy is generally believed to improve the acceptance of new technologies [42]. One speculative reason that could further explain this is that although users feel competent using mobile banking, they still worry about the feasibility, hidden charges, or safety of this service, thus reducing their available use of mobile banking. This contrasts to previous studies [82] that indicated self-efficacy as a positive predictor of mobile banking adoption. These studies stated that users who consider themselves capable are more likely to adopt mobile banking. Yet, the current study found that confidence did not always correlate with increased adoption rates, possibly because there are more external concerns than just usability.

Social influence was another significant positive predictor of mobile banking adoption ($B = 0.642$, $p = 0.000$), and this had a strong correlation ($r = 0.944$, $p = 0.000$). That is, people who believe that their peers, family, or colleagues accept and recommend mobile banking tend to adopt it. This statement is supported by the fact that the mean score in the descriptive analysis is high, showing that the respondents are aware of how much society influences their behavior when banking. These findings agree with the UTAUT Theory of User Technology Acceptance [44], where social influence is one of the important dimensions that affect technology adoption. Similar studies have found that peer recommendations, social media exposure, and institutional endorsements shape users' decisions to embrace mobile banking [2].

Therefore social influence has a significant correlation with self-efficacy ($r = 0.941$, $p = 0.000$); thus, those feeling competent in mobile banking are also motivated by social influence. This finding is consistent with previous findings [100] that reveal how social norms can affect users' confidence and attitude to explore mobile banking. More broadly, financial institutions can use social media campaigns and peer referrals to increase adoption. As it applies to mobile banking, compatibility is how well mobile banking practices fit into users' established values, lifestyles, and current financial practices. In line with prior findings about the role of compatibility in the adoption of new technologies [103], the correlation analysis indicates a strong relationship, $r = 0.873$, $p = 0.000$, between the compatibility of a new technology and the topic of this research, mobile banking adoption. Nonetheless, the regression analysis revealed that compatibility was not a significant predictor of adoption ($B = -0.028$, $p = 0.615$). This indicates that although mobile banking is recognized in users' daily routines, it is not the alignment of mobile banking with their lifestyle that primarily drives adoption. Previous studies have confirmed by [2,6] that compatibility is one of the greatest predictors of mobile banking adoption, highlighting that consumers are more inclined to incorporate technologies that are potentially complementary to their financial behaviors. On the other hand, our results indicate that what is more determinant could be perceived cost and social influence. This could be explained by

different expectations about dating, as users are in better economic and cultural contexts where they value affordability and social validation than finding a compatible partner.

The most important predictor of mobile banking adoption was the cost of usage ($B = 0.857$, $p = 0.000$), with the highest correlation ($r = 0.965$, $p = 0.000$). This indicates that transaction fees, internet charges, and extra fees have a strong impact on user preferences towards mobile banking. Also, before, the price is one of the most important aspects of mobile banking for users, as indicated by the descriptive analysis with a high mean score, such as “Hidden taxes and unexpected costs make mobile banking expensive” ($M = 4.35$, $SD = 1.05$). These results corroborate similar studies [4,65] indicating that transaction fees and data charges are hurdles to mobile banking acceptance. However, our results also suggest that despite these issues, users are still adopting mobile banking, which may be due to the convenience and essentiality of digital financial services. That indicates that financial institutions must focus on the clarity of pricing and market-friendly visitors to gain individual confidence.

At the same time, the model summary shows that independent variables explain 97.6% of the variance in mobile banking adoption ($R^2 = 0.976$), which points to the overall predictive quality of the model. The ANOVA ($F = 3736.694$, $p = 0.000$) demonstrated that the model was significant. These results reflect the importance of cost, social influence, and self-efficacy in determining the decision to adopt mobile banking, but not compatibility, despite a positive correlation, as being a strong predictor in the model. From a pragmatic standpoint, these results imply that banks and financial service providers should focus on reducing perceived costs and the use of social influence to increase the adoption rate. Social influence can be qualitatively improved by using social proof in marketing campaigns (testimonials, peer referrals, and testimonials, etc.). In addition, resolving cost-related issues through the provision of persuasive discount offers, zero-cost transactions, and clear pricing structures could boost user adoption rates manifold.

In contrast to previous studies, this study aligns with factors of social influence and cost as the main determinants of mobile banking adoption [2]. However, it is not consistent with the research that highlights self-efficacy and compatibility as critical factors [111]. This suggests that the interaction among these variables may be modulated by context-specific factors, including economic conditions, consumer trust, or levels of digital literacy. In addition, the adverse effect of self-efficacy on adoption contradicts the prevailing beliefs. Future investigations could help examine whether security perceptions, trust boundaries, or usability limitations mediate that relationship. Likewise, the non-significance of compatibility suggests that although there is perceived relevance, certain external factors could govern the decision to accept mobile banking users, such as price and peer influence. The study's suggestions are strategically relevant to both online and traditional banks. By not segmenting the categories, however, the suggestions might lack the complicated sensibilities of Gen Z consumers. For instance, online banks will benefit the most from activities aimed at improving digital self-efficacy and social influence through influencer-based marketing campaigns and gamified onboarding, while traditional banks will need to work harder in an attempt to close perceived cost gaps and refine their apps for greater compatibility. Future research can investigate the interaction effects of bank type on study variables in an attempt to achieve maximum precision in targeting mobile banking adoption programs. Thus, extend the generalizability of UTAUT2's to younger generations prone to technology (e.g., by including digital self-efficacy as a moderator, as suggested [65]). This kind of extension opposes the generalizability assumption of UTAUT2's by presenting socially influenced and price-sensitive adoption processes, specific to Gen Z, suggesting an innovative and context-contingent theoretical approach. Practically, the research results, namely the high effect of compatibility and the conflicting lower effect of perceived cost for

high-income Gen Z segments, suggest that banks should prioritize the most effective way of app integration with social media like TikTok or Instagram for peer recommendation over cost reduction promotion. Furthermore, personalized onboarding guides that leverage Gen Z's strong digital self-efficacy can optimize adoption rates, addressing the research, which identified that the majority of respondents favored intuitive interfaces over monetary incentives, thus offering granular, data-driven solutions for banks to adapt to Gen Z's unique adoption patterns.

6. Conclusions

In conclusion, this research delves deeper into the factors that determine the mobile banking adoption. The results indicate that usage price and social influence are the two main predictors of adoption, while self-efficacy has a counterintuitive negative impact and compatibility does not have a significant impact. These findings have implications for financial services providers, who must seek cost-effective solutions and social marketing approaches. Future research should further explore the negative effect of self-efficacy and the effects of trust and security perceptions on mobile banking adoption. All of these will lead to greater adoption and use of mobile banking services in consumer segments, thus enhancing the overall mobile banking experience for bank customers. The strongest predictors of mobile banking adoption are the cost of usage. Mobile banking is significantly affected by high transaction fees, internet charges, and hidden charges. In order to improve the adoption, financial institutions should implement transparent pricing and cost reduction strategies. Social influence has a positive impact on mobile banking adoption. Adoption is driven by peer recommendations, institutional endorsements, and social acceptance. Marketing strategies that utilize social proof, referrals, and recommendations from a community can draw in users. Low self-efficacy has a negative effect on adoption. Even among those who say they are confident in their technical ability to use mobile banking, they may still be hesitant because of security, trust, or hidden costs. Compatibility is not a major contributor to mobile banking adoption. Although mobile banking is in line with users' lifestyles and financial habits, this does not have a strong impact on adoption decisions. Things like cost and social influence seem to be more dominant external factors.

7. Recommendations for Practice

Based on the study findings, financial institutions could focus on and adjust cost transparency and affordability to increase mobile banking adoption. According to the study, usage cost is the best predictor of adoption, showing that users are extremely price sensitive to transaction fees, data charges, and hidden costs. Banks and financial service provider organizations must offer low- or zero-fee transactions, especially for repeat use cases like fund transfers or utility bill payments. Furthermore, transparency in pricing models and the removal of hidden transaction fees can establish greater user confidence and trust. Mobile banking providers must partner with telecoms to supply discounted or bundled data plans to reduce the perceived cost hurdle. If these concerns are addressed, mobile banking will become more widespread. In addition, social influence and trust-building strategies can significantly increase the rate of adoption. Given that social influence was identified as a strong predictor, financial institutions should focus on implementing referral programs, leveraging peer endorsements, and creating social media marketing campaigns to facilitate word of mouth adoption. Moreover, to tackle self-efficacy problems, it is crucial to offer users extensive educational resources, such as tutorials, webinars, and customer support, to overcome skepticism regarding security and usability aspects. Further adoption can be driven with the help of two-factor authentication, fraud protection measures, and transparent data policies that enhance trust in mobile banking

security. Putting emphasis on cost efficiency, social influence, and user trust can enable financial services to create a more inclusive and widely accepted mobile banking ecosystem.

8. Limitations and Recommendations for Future Research

Although this study provides useful information, there are a few limitations to be noted. Second, the study was conducted on a particular population and therefore could limit generalizations to other regions or groups. Cultural and socioeconomic factors such as economic conditions, digital literacy, and banking infrastructure could shape the mobile banking adoption process and influence the study results that are not captured in this study. Moreover, the authors used predominantly self-reported measures; for example, it is well known that self-reported measures can be affected by response biases (social desirability or overestimation of mobile banking usage for status reasons). Future research can use longitudinal research or real-life transaction data to better understand user behavior. In addition, other factors that can significantly influence mobile banking adoption decisions, such as trust, perceived risk, and regulatory policies, were not included. Incorporating these extra variables into the model would give a much more thorough analysis.

Other potential directions for further research could be to investigate the mediating and moderating role of trust, security concerns, and financial literacy on the relationship between mobile banking and adoption. As such, it is important to explore whether factors such as security perceptions or system complexity may be leading to this unexpected finding of self-efficacy and adoption being negatively related. Cross-cultural comparisons of the Firmness–Creativity Trap can also clarify how other factors embedded in regional and cultural settings contribute to significant differences in Firmness–Creativity Trap adoption behavior, particularly between developed and developing economies. Furthermore, future research could explore the impact of emerging financial technologies, such as AI-based banking assistants and blockchain transactions, on user perceptions and adoption patterns; By focusing on these issues, further studies can provide a more detailed and international perspective on mobile banking adoption. The study focuses on existing models, but does not address cutting-edge technologies such as AI-driven risk analysis, quantum computing, blockchain security, or biometric authentication. Future directions should include predictive analytics, machine learning for fraud detection, or decentralized finance (DeFi). In addition, the study is centered on Generation Z in the U.S. without comparing adoption rates in developing countries or cross-cultural perspectives. Therefore, expanding the research to Africa, Asia, and Latin America could make the study more impactful and globally relevant. The paper also finds that self-efficacy negatively affects adoption, which contradicts previous research. More discussion is needed about whether security concerns, trust issues, or cognitive overload are mediating factors. Future studies could introduce trust, cybersecurity literacy, and regulatory concerns as new variables.

The study also misses key emerging trends in mobile banking. Therefore, future studies may examine how crypto wallets can be integrated into mobile banking. Similarly, future studies should explore AI-driven compliance models for KYC (Know Your Customer) and AML (Anti-Money Laundering). In addition, future studies should examine how users interact with AI chatbots for financial transactions and decision making. Future studies may also examine Voice Recognition & NLP-based Banking Services. More banks are adopting voice-activated banking; therefore, studies may unravel how it impacts Gen Z adoption. The study also relies heavily on quantitative measures but lacks qualitative insights from focus groups or interviews. Including case studies of real-world banking failures due to cybersecurity breaches could make the discussion more engaging. Analyzing sentiment analysis on social media data could provide deeper insight into consumer trust issues. Whereas methods such as Harman's single-factor test or marker variable procedure can

be helpful in the testing of Common-Method Bias (CMB), their absence in this research was primarily a matter of acknowledging that this was exploratory research and the constraints of available data. The study sought only to make preliminary observations about the relationships in question with limited availability of competing data sources or marker variables. Moreover, recent criticism has questioned the sensitivity and reliability of traditional CMB detection metrics because their absence does not automatically render findings invalid, particularly if theoretical constructs and careful instrument building are in place. Therefore, the author does, nonetheless, mention this as a limitation and proposes that follow-up studies employ longitudinal or multisource designs to enhance internal validity.

9. Practical Implications

Current research adds to the mobile banking literature and provides implications for human-computer interaction (HCI) and fintech development by exploring how self-efficacy and perceived usage cost impact mobile banking adoption. Knowledge of these elements assists developers in creating more user-oriented, secure, and accessible mobile banking applications for Generation Z. Consideration of how the interface fits into the daily lives of Generation Z users, reducing the time it takes users to secure their information, and minimizing cognitive effort can encourage innovation in areas such as AI-based banking assistants, biometric authentication, and UI enhancements [111]. From a financial perspective, the study also provides insights into Gen Z's use of mobile banking services and mobile convergence and tools that can help banks develop stronger digital banking strategies. By exploring the influences of usage costs and financial literacy, the research sheds light on opportunities to ease such barriers to financial inclusion and to improve the banking services offered to these younger customers. The results would also serve to improve behavior patterns in mobile banking to help with risk assessment and validation engines [111].

The study of behavioral economics and its common principles, for example, social effect and perceived risk on financial decision processes in a digital environment, is the objective of this article. The study of behavioral economics theories (prospect theory, bounded rationality, and network effects) was conducted to perform a qualitative analysis of qualitative interviews. This also explains why a relevant niche of Gen Z users misses convenience and does not consider adopting a mobile bank application, which is much easier to use. Banks leverage this psychological driver to tailor the creation of incentives, nudges, and personalized advice aligned with individual needs [44]. To guide banks and fintech towards methods of raising usage rates with Gen Z, the study provides market intelligence for the space that enables financial institutions to gauge this next generation using binoculars of their lifestyle and financial behavior to construct digital marketing strategies, reward programs and customer engagement efforts that influence Gen Z's daily decision making. Furthermore, the study provides a peer pressure and social media marketing perspective to attract the younger generation to mobile banking. This research provides a sequence of innovative contributions to the mobile banking adoption scholarship. To begin with, it focuses on Generation Z customers in the United States, a group that has been less studied than the Millennials and the previous generations, although they have experienced growing economic power and distinctively digitally native characteristics. Second, while many of the previous works have discussed proven constructs like perceived risk, trust, and utility, this study introduces a newer set of psychological and environmental factors, social influence, compatibility, digital self-efficacy, and perceived cost, that better resonate with Gen Z's unique motivations and internet usage. Finally, the study uses

the three-factor UTAUT2 model with adapted variables and less reliance on traditional trust-risk models, providing a new theoretical view of the adoption of mobile banking.

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