

FACTORS INFLUENCING THE ADOPTION OF MOBILE BANKING APPS: AN EMPIRICAL ANALYSIS

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Abstract

The rapid development of mobile technologies has changed the world's delivery of financial services, notably in emerging economies. This research paper aimed to explore the determinants of mobile banking applications usage in Pakistan based on an extended TAM framework. The study explored the influence of the perceived usefulness, perceived ease of use, trust, and perceived security on behavioral intention to utilize mobile banking. 250 questionnaires were filled by Faisalabad users of different age, education, and income. Subsequently, the author conducted descriptive, correlation, and regression analysis in SPSS 26.0. The key findings revolved around the fact that all IVs had a significant positive effect on BI, explaining 68% of the total variance. Thus, PU was the most significant factor to influence BI, and the leister impactful factor was trust. Moreover, SEM findings confirmed that TR mediated the connection between PS and BI due to the positive impact of the users' feeling of security on trust, which, in turn, prompted their behavioral intention. The demographic analysis established that younger, well-educated people are more prone to adopt mobile banking, while older and less digital literate users are discouraged by fear of lack of security and ease of use. The current study contributed to theory and practice by extending TAM with trust and PS as essential variables relevant to the Pakistani consumer banking sector.

Keywords: Mobile banking, Technology Acceptance Model (TAM), trust, perceived security, behavioral intention, Pakistan

1. INTRODUCTION

The 21st century has seen a remarkable change in nearly every sector of human life due to increased technological development. One of the most affected domains is the financial services sector, which has taken a new trend of digital financial services. This transformation has been made possible by the emergence of banking applications, also referring to as mobile banking apps. Mobile banking is an innovation that allows individuals to conduct several financial activities, including checking their account balance, transferring money, or paying utility bills electronically from their mobile devices or tablets. Mobile banking has not only revolutionized the banking experience but has also facilitated financial inclusion worldwide, specifically in developing countries. Pakistan, a developing economy located in South Asia, has witnessed several digital developments in the past decade. The State Bank of Pakistan has put much emphasis on digital transformation in financial services such as the NFIS or the Novel Raast Instant Payment System. The financial regulatory authority issued licenses to branchless banking services such as Easypaisa, JazzCash, and commercial banks launched mobile banking services like HBL Konnect, UBL Digital, and Meezan Mobile App, leading to increased access



to financial services by the unbanked or underbanked population. However, adoption remains uneven regardless of these developments. According to the SBP, 2014, "only about 30% of adults actively use mobile or internet banking services" in Pakistan. Thus, there is a considerable gap between the technology available and the consumer.

Furthermore, this gap is essential to address because mobile banking applications have the potential to remove various challenges existing in traditional banking, such as waiting in long queues, limited availability of branches, and high transaction costs. However, a significant portion of Pakistani citizens remains hesitant to adopt digital alternatives due to perceived risks, a general lack of trust and understanding, and limitations in technical capacity. As a result, available evidence suggests that the goal of the cashless economy cannot be achieved in the short term without comprehensive empirical evidence regarding the reliance on and barriers to mobile banking adoption. As the banking sector undergoes significant transformations due to technological innovations, the importance of financial technology continues to grow. Mobile banking applications, in particular, have become one of the most transformative tools for users in modern banking. Indeed, applications allow users to check their remaining balances, transfer funds, pay bills, and track investments in a matter of days. With the increasing prevalence of smartphones and Internet connectivity, the use of mobile banking has significantly increased in developing countries. However, while technological advancement has played a key part in the development of mobile banking, several variations and factors continue to impact the adoption rate.

Pakistan, a developing economy with an expanding digital landscape, is indeed an interesting case to explore the issue of mobile banking adoption. Idea, which "opened its doors" ten years ago, when the State Bank of Pakistan started to promote digital financial inclusion, implementing the National Financial Inclusion Strategy and a Digital Banking Framework. The rise of branchless banking services such as Easypaisa, Jazz Cash, UBL Omni, etc., has increased the share of the population who had access to financial services (SBP, 2023). However, a significant part of the population still prefers to make their purchases in cash and use traditional banking services. Therefore, the question of why people adopt mobile banking and others do not remain to be highly relevant for both scholars and practitioners. Literature suggests that this decision is complex and cannot be attributed only to one's' access to technology; instead, it is influenced by a combination of individual, social, and other factors. The Technology Acceptance Model proposed by Davis in 1989 states that there are two immediate determinants of acceptance perceived usefulness and perceived ease of use. However, this theory has been broadened in the following years and combined with other, more extended theories such as the Unified Theory of Acceptance and Use of Technology tries to better explain the behavior of the user.

Furthermore, in Pakistan, there are other contextual factors influencing the adoption of mobile banking apps in Pakistan, including literacy levels, technological readiness, and socio-economic status. According to Ameen et al., the lack of consumers' confidence in the use of banking as a digitalized platform in developing countries is due to data concerns and issues, privacy, and trust in online platforms. Raza et al. supports that the impact of cultural differences, lack of digital expertise, and unawareness of the advantages of mobile banking was also the reasons of insufficient adoption. In this way, while the technological aspects continue to be enhanced, the aspects of attitudes and behavior remain serious obstacles to the greater adoption of mobile banking services. This study, therefore, aims to empirically analyze the factors affecting the adoption of mobile banking applications in Pakistan. In other words, the research question was how some customers are responding to "Yes" about Mobile Banking Apps and some customers are responding "No." This research question can be answered, analyzing various dimensions such as PU, PEOU, Trust, Security, and Convenience. In the meantime, the moderating role of basic demographic characteristics as well as the external role of internet availability and service quality on mobile telephone.

The reasons for the global trend of switching to mobile financial services are obvious - convenience, accessibility, and innovation. According to Statista, more than 2.5 billion people use mobile banking

services worldwide, and this number is expected to amount to more than 3.6 billion by 2026. In terms of developed nations, almost everyone uses mobile banking, while developing countries have various rates due to socio-economic reasons and lacking proper infrastructure. In the case of Pakistan, the country's banking sector witnessed the growth of digital transactions, especially after the outbreak of the COVID-19 pandemic forced all financial operations to go remote. The central bank of Pakistan reports that" mobile banking had increased by 85%" from 2021 through 2023. However, the numbers of such transactions are still far behind from those in neighboring India and Bangladesh, where PIBU is more advanced due to the higher literacy rate and consumers' higher trust in digital platforms. Various factors may underlie these differences, such as unawareness, fraud risk perception, privacy concerns, slow mobile internet, and trust issues, as previous studies argue. Yet, most of the literature in Pakistan is too fragmented, covering one specific component of the problem and often disregarding the psychological and behavioral approach to user behavior. Therefore, the proposed study aims at empirically researching the primary factors of PIBU adoption, including perceived usefulness, ease of use, trust, security, and convenience.

Shahzad et al., (2023), The current study explored the influence of reward and recognition on employee motivation, particularly in the banking sector of Pakistan. This quantitative research design utilized 200 respondents with whom data were collected through questionnaires and analyzed using SPSS. The outcomes of regression analysis indicated that there is a strong positive relationship between reward system and employee motivation, evidenced by R Square 0.772 which led to the rejection of the null hypothesis. Nonetheless, it is revealed that non-monetary recognition is vital in addition to the use of pay. This study is critical of the sole use of pay and calls for the integration of human resource management practices with the concession of reward strategies such as Eid bonuses and involving employees in decision-making to enhance motivation and job satisfaction.

Zia et al., (2024) the paper finds that both internet and mobile banking have materially enhanced customer satisfaction in Pakistan. However, satisfaction levels inured even more markedly to customers choosing to use internet banking due to the ability to transact in their routine after hours. More significantly, mobile banking, in addition to satisfaction, has helped expand services to those previously excluded. The future growth potential is promising, and with expanding adoption, greater financial access and inclusion is inevitable.

Mobile banking applications have revolutionized how financial services are accessed, offering unparalleled convenience and efficiency for users worldwide. This technological advancement has transformed the traditional banking landscape, reducing reliance on physical branches and reshaping industry operations (Geebren et al., 2020). In Pakistan, the banking sector is a major contributor to the nation's GDP, and recently, artificial intelligence and machine learning have been incorporated to improve both automation and financial technology, namely mobile banking services (Polireddi, 2024).

The explosive spread of digital technology has triggered a substantial change in the global financial arena, with mobile banking being at the epicenter of this development ((Mazhar et al., 2014). Furthermore, this innovation is considered one of consumers' most convenient and accessible financial transactions that allows them to undertake the operation anywhere and at any time using their phone (Umair & Butt, 2025).

The Pakistani banking sector has adopted mobile banking to improve customer service and expand its services to more people. In Pakistan, mobile banking is known for its ease of use, time-saving, and rising number of smartphones. It is used as the simplest form of paying bills, transferring money, and interconnected with open banking. It is, however, unpopular due to insufficient digital skills, the unreliability of systems, frequent loss of internet connectivity and data, and fear of systems, notably among the uneducated and aged in the rural areas. (Mustafa & Khan, 2025). This research will examine what measures need to be taken to increase the acceptance of mobile banking in Pakistan (Sikandar, 2025). This study aims to show the impact factors, including perceived usefulness, ease of

use, trust, and social influence, and their influence on the adoption rate by banking customers in the Pakistani context. In addition, it aims to determine the most vital factors affecting the attitudes of consumers in the process of mobile banking adoption so as to obtain a more holistic view of technology adoption in the Pakistan banking industry (Abbas et al., 2018). This study is of critical importance, considering the growth of the digital economy in Pakistan and the attention to financial inclusion, provides actionable findings to financial institutions and policymakers (Khan et al., 2025).

Moreover, the study will provide an important organization of knowledge concerning the organizational, strategic, technological, functional, and economic factors affecting M-banking adoption in view of the State Bank of Pakistan's directive ensuring extensive technology-based operations in banks (SALEEMa & RASHIDb, 2011). The study will critically examine the interplay between customer expectations and the actual quality of services delivered by mobile banking platforms, reflecting gaps in the delivery of services despite regulatory encouragement of digital financial inclusion. Therefore, the proposed focus is essential since much of the existing literature in M-banking service quality and adoption is based on results from developed countries, creating significant localized knowledge gaps about countries such as Pakistan (Ikram & Rodrigues, 2025).

This study will investigate the correlation between ubiquitous finance control and perceived compatibility with different customer adoption behaviors. This will create a more diverse view of the psychological and practical aspects involved. Furthermore, few studies have been conducted specifically in Pakistan regarding some of the conditions analyzed in this study (Abbas et al., 2018). Although some studies have explored mobile wallet adoption and e-payment systems in Pakistan, the relationship between behavioral intention, perceived risk, perceived trust, and perceived service quality in digital wallet adoption has not been thoroughly examined in this perspective. However, the prevalence of digital financial transactions and mobile banking users continues to grow. For example, in Pakistan: e-banking transactions increased by 12% to 16% in Q1-FY22 compared to Q1-FY21, and mobile banking accounted for 11.3 million users with a 4% quarter-over-quarter increase (Khan & Abideen, 2023).

Roomi et al., (2018) Qualitative data retrieved from semi-structured interviews. This type of data will be used to identify recurrent themes and stories among users to gain a more profound understanding of users' experiences and perspectives on mobile banking. As a result, valuable insights and knowledge of the normative consensus of mobile banking acquisition will be gained. Thematic analysis: Categorization of frequent experiences shall be executed.

Hassan et al., (2021), This study seeks to use a mixed-method methodology by administering surveys to collect quantitative data and then semi-structured interviews to collect qualitative insight. In the first phase, there will be a large-scale surveys conducted among the users of mobile banking at a diverse demography within Pakistan. Here, it will measure the respondents' perceived benefits, risks, and user experience.

The determinant of mobile banking adoption perceived to be the strongest was perceived usefulness. Most respondents agreed on the convenience, efficiency, and accessibility of financial transactions, which was in line with Davis's Technology Acceptance Model in 1989. One of the model assumptions states that usefulness has the most direct impact on the user's behavioral intention to adopt technology (Davis, 1989). This finding is consistent with previous studies was undertaking in developing economies. As Pakistan has growing its mobile internet penetration, users perceive mobile banking as a time-sensitive instrument to complete tasks related to financial activities economies (Kazi & Mannan, 2013)

1.1 Background of the Study

The rise of digital banking has revolutionized how consumers manage their finances. Globally, the adoption of mobile banking has increased rapidly, particularly after the COVID-19 pandemic, which forced financial institutions to strengthen their online and mobile platforms. According to a report



by Statista (2024), the number of global mobile banking users exceeded 2.5 billion in 2023 and is expected to reach 3.6 billion by 2026. In Pakistan, the number of mobile banking users also witnessed substantial growth, with transactions through mobile apps increasing by over 80% between 2021 and 2023 (SBP, 2024). However, despite this growth, there exists a significant divide between urban and rural populations in terms of mobile banking usage. While urban areas have greater access to reliable internet and smartphones, rural communities often lack digital literacy and trust in online financial systems. This urban-rural divide makes Pakistan a suitable environment for studying behavioral factors affecting adoption decisions.

1.2 Problem Statement

While mobile banking offers numerous advantages such as convenience, time-saving, and cost-effectiveness its adoption in Pakistan remains below potential. Many users continue to rely on traditional banking channels or cash transactions. The core problem lies in understanding why adoption remains inconsistent despite increased digital penetration and government support. Previous research has identified several potential barriers, including lack of trust, perceived risk, fear of fraud, and limited awareness (Yazdi et al., 2020). Yet, few empirical studies have comprehensively analyzed how these factors interact in Pakistan's socio-economic context. This study addresses this gap by empirically examining the adoption factors that influence the decision to use or reject mobile banking apps in Pakistan. The findings are expected to provide practical insights for policymakers, banks, and technology developers seeking to improve user engagement and trust in mobile banking platforms.

1.3 Research Objectives

The key objectives of this study include the following aspects:

- 1. Examining the overall level of mobile banking adoption in Pakistan.
- 2. Investigating the prominent factors that affect users' intentions to adopt mobile banking apps.
- 3. Evaluating the impact of perceived usefulness, perceived ease of use, trust, and perceived security on regulations of adoption.

1.4 Research Questions

- 1. How do such variables like trust and perceived security regulate users' intentions to adopt mobile banking apps?
- 2. Can perceived usefulness and perceived ease of use predict significantly the adoption of mobile banking?
- 3. Which factors limit non-users from adopting mobile banking apps most significantly?
- 4. Can we detect demographic differences between users and non-users concerning the details of mobile banking adoption behavior?

1.5 Significance of the Study

The current research has several theoretical and practical implications. The former refer to the theoretical knowledge in usage of such established technology adoption models, particularly TAM and UTAUT, as applicable in Pakistan's financial sector. As the developed models were tested in a developing economy, their applicability may be generalized, accounting for the context-specific factors. Furthermore, use of the technology acceptance frameworks allowed to identify such determinants and their respective significance across the same institution category. The practical implications of the research are relevant for commercial banks, FinTech organizations, and policymakers. They may design tailored strategies to enhance the promotion and resilience of mobile banking services. For example, developed trust and security utmost challenges? Use of stronger data



protection tools and public awareness campaigns can be applied by commercial banks to alleviate the issues uncovered with customer education's instrumental role in increasing mobile users'/driver penetration into underbanked rural areas.

3. METHODOLOGY

3.1 Research Design

This study uses a quantitative approach and survey design to empirically investigate the adoption factors influencing mobile banking app users in Pakistan. Quantitative research was suitable for this study because it involves the collection of numerical data to analyze the quantifiable relationship between critical variables as it describes relationships and tests theoretical factors derived from the TAM and its extensions. Accordingly, the research is explanatory in nature. It was cross-sectional in the design and used data collected during one period from a sample of respondents in their capacity as current and potential users in Faisalabad, Pakistan.

Creswell al et. (2017) Quantitative method is preferred in this case since it allows the collection of numerical data that can be analyzed statistically as well as establish relationships among the main variables. An explanatory study ostensibly aims to test theoretical relationships inferred from the Technology Acceptance Model based on TAM's extensions.

3.2 Population and Sample

The target population for this study comprises individuals with access to smartphones and at least one bank account in a commercial bank in Pakistan. The choice of Faisalabad arises from the areas' diversified socio-economic context and considerable proportions of an urban and semi-urban population, both ideal for researching mobile banking adoption. A convenience sampling methodology was selected due to the restricted accessibility and available time. This approach was adopted primarily because random sampling could not be employed in behavioral research, and convenience sampling is the most common alternative when it is not possible to accommodate a random approach. In total, 300 questionnaires were sent out through Google forms and in person. A total of 270 responses were collected, and 250 valid responses were considered useful after data cleaning and validation processes. Data was gathered for five months (January to May 2025) to maintain the study's time frame and obtain a broad and varied response from all members. Data collection was done in both online and offline ways to gain more people and cover a broad geographic area.

3.3 Reliability and Validity

The reliability of the constructs was validated through Cronbach's Alpha (α). All constructs had $\alpha > 0.70$. Thus, the measures exhibited internal consistency Hair et al., 2019). Construct validity was validated through Confirmatory Factor Analysis making sure each item significantly loaded 0.6 on its respective latent variable. Finally, content validity was validated through expert review by two academic experts in information systems and banking.

Table 1

Variables	Cronbach's Alpha (α)
Perceived Usefulness.	0.87
Perceived Ease of Use.	0.84
Trust.	0.89
Perceived Security.	0.86
Behavioral Intention.	0.91



3.4 Data Analysis Techniques

Data were analyzed using SPSS 26.0 software packages. Descriptive statistics were first used to have a quick overview of respondent demographics. Furthermore, correlation and regression analyses were carried out too in order to test the relationships among the variables.

The regression model is used as follows:

BI = β 0 + β 1 PU + β 2 PEOU + β 3 TR + β 4 PS + ϵ . These terms are the following: BI = Behavioral Intention, PU = Perceived Usefulness,

Also PEOU = Perceived Ease of Use,

Also TR = Trust, and PS = Perceived Security,

And there is arbitrarily term: ϵ .

4. RESULTS

This section provides the results of the empirical study based on the data collected from 250 respondents from Faisalabad, Pakistan. The results are divided into four sections and include: (i) respondents' demographic characteristics; (ii) descriptive statistics of the key variables; (iii) correlation analysis; (iv) regression and structural model analysis. The purpose of the section is to indicate how perceived usefulness, perceived ease of use, trust, and perceived security are related to the users' behavioral intention to use mobile banking applications.

4.1 Demographic Profile of Respondents.

Table 1: Demographic Characteristics of Respondents.

Variable	Category	Frequency	Percentage
Gender			
	Male	148	59.2
	Female	102	40.8
Age (years)			
	18-25	92	36.8
	26-35	104	41.6
Education			
	Intermediate	26	10.4
	Bachelor's	122	48.8
	Master's or above	102	40.8
Monthly Income (F	PKR)		
	Below 30,000	38	15.2
	30,001-60,000	86	34.4

28.8				
21.6				
Mobile Banking Experience				
23.2				

The demographic profile discovered that the majority of respondents were between 26-35 years' old which accounted for 41.6% and represented digitally active young professionals who actively used mobile technologies. Males were slightly more than females and accounted for 59.2% and 40.8%, respectively, which was due to higher mobile banking usage among men in Pakistan. Moreover, most respondents had a bachelor's degree, which showed the significance of education in digitalization.

Table 2: Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum
Perceived Usefulness.	4.21	0.56	2.80
Perceived Ease of Use.	4.09	0.61	2.67
Trust.	3.96	0.72	2.00
Perceived Security.	3.88	0.68	2.00
Behavioral Intention.	4.14	0.58	2.67

The findings display high mean scores for all variables demonstrating a relatively positive overall attitude towards mobile banking. The best-scored factor is Perceived usefulness where M=4.21 proves that using the apps is very straightforward and will most likely influence the choice of using said app. The worst-scored factor is perceived security. It can be concluded that, even in 2021, people are still wary of sharing their personal information and potential fraud when using this type of app.

4.2 Correlation Analysis

Table 3: Pearson correlation coefficients.

Variable	PU	PEOU	TR	PS	BI	TR
Perceived Usefulness .	1					
Perceived Ease of Use.	0.62**	1				
Trust.	0.58**	0.56**	1			1
Perceived Security.	0.52**	0.48**	0.65**	1		0.65**
Behavioral Intention. 0	0.72**	0.61**	0.69**	0.61**	1	0.67**

p < 0.01



Consequently, all correlations were positive and statistically significantly correlated with the user's intention to adopt mobile banking apps at p < .01. The correlation's strongest depended on perceived usefulness and behavioral intention, yielding r = .72. This finding validates the TAM model's hypothesis with data indicating that usefulness is a critically essential factor for people to adopt new technology.

4.3 Regression Analysis

Multiple regression analysis was conducted to determine the extent to which the independent variables could predict the dependent one. Before conducting a multiple regression to evaluate the independent variables' predictive abilities of BI, independent testing was carried out.

Unstandardized Independent Standard Standardized t-value p-value Variable В **Error** B (Beta) Perceived 0.34 0.06 0.37 5.67 .000*** Usefulness. Perceived Ease 0.28 0.05 0.30 5.43 .000*** of Use. 0.21 .000*** Trust. 0.04 0.25 4.81 Perceived 0.16 0.05 0.18 3.28 .001** Security.

Table 4: Regression Analysis Summary

The results of the multiple linear regression analysis showed that all four hypothesized predictors were statistically significant positive contributors to the model. The strongest predictor was Perceived Usefulness: $\beta = 0.37$, p <.001, followed by Perceived Ease of Use: $\beta = 0.30$, p <.001, Trust: $\beta = 0.25$, p <.001, and Perceived Security: $\beta = 0.18$, p =.001. These results positively suggest that in order to encourage adoption, practitioners ought to prioritize creating a useful and easy-to-use product while also making robust efforts to ensure that adequate psychological safeguards and security measures are in place so that product seems to be quite safe to their users.

Statistic	Value
R ²	0.68
Adjusted R ²	0.67
F	129.64
p-value	< .001

Table 5: Model Summary.

The analysis depicted in Table 7 shows a highly significant and robust regression model. A large proportion of 68% of the variability in the dependent variable is explained. Furthermore, merely 67% of the variability in the dependent variable is explained after taking into account the number of predictors. Statistical significance is confirmed, as the highly significant F-statistic (p <.001) suggests that the overall regression model outperformed a model with no independent variables in predicting the outcome.

Table 6: Model Fit Indices

Fit Index	Recommended Value	Obtained Value	Interpretation
x²/df	< 3.0	2.14	Good fit

GFI	> 0.90	0.93	Good fit
CFI	> 0.90	0.95	Excellent fit
TLI	> 0.90	0.94	Excellent fit
RMSEA	< 0.08	0.056	Acceptable fit

The hypothesized measurement model was examined and confirmed by Confirmatory Factor Analysis. Fit indices of this model described it well, as shown in the following: $x^2/df = 2.14$, GFI = 0.93, CFI = 0.95, TLI = 0.94, RMSEA = 0.056. All values were less than or equal to their cutoff limits; hence, this model is the best possible description of the structure located beneath the data. The results show that trust partially mediates the effect of perceived security on behavioral intention, that is better perceptions of security increase trust which leads to adoption

5. CONCLUSION

The research findings were built on 250 respondents' data, which shows perceived usefulness has the highest coefficient in determining behavioral intention. Moreover, perceived ease of use also displays a high determinant. The majority of users highlight how smooth navigation and fast answering design and simple interface prompt them to continue using. However, a minor number of this perfect usage. Older users or digital illiterate users find it hard to use, reflecting that the technology adoption design and universality. Trust was also a determinant linkage factor with both users perceived security and decision to use. The respondents expressed how they expect the bank to assure of their data, saving security, prevent fraud and promise a convinced transaction. Although perceived security has less direct impact on adoption, it indicates more through trust, which has a bigger impact. A user who believes mobile banking is secured is likely to trust their bank and therefore likely to use. Therefore, enhanced security is also important to sustainable use. The data collected shows the extended TAM is applicable in the Pakistan setting, use, perceived, and trust-encouraged decisions but perceived and trust software use a sustainability determinant. This proves that mobile banking is not just a technology but is also a people decision.

RECOMMENDATIONS

It is important for banks to prioritize usable, reliable experiences that minimize effort and errors. Strengthen security signaling with biometrics, clear privacy notices, and fraud alerts to reduce perceived risk. Tailor onboarding, education, and promotions by segment age, digital literacy, and prior banking experience using tutorials for late adopters and advanced tools for power users. Leverage social proof via ratings, referrals, and community partnerships to increase perceived usefulness. Offer early-value incentives (fee waivers, cashbacks) to spur first transaction and habit formation. Maintain continuous feedback loops to iterate quickly and personalize support, including bill pay, QR payments, savings, and credit features. Hence, in practice, banks should encourage trust, design an easy-to-use, intuitive infrastructure which informs users about the strong security pillars contained within it.

CONFLICTS OF INTEREST

There are no conflicts of interest

REFERENCES

- 1. Abbas, Sayyed Khawar, et al. "Integration of TTF, UTAUT, and ITM for mobile banking adoption." *International Journal of Advanced Engineering, Management and Science (IJAEMS) Vol-4, Issue-5* (2018).
- 2. Geebren, A., Jabbar, A., & Luo, M. (2021). Examining the role of consumer satisfaction within mobile eco-systems: Evidence from mobile banking services. *Computers in Human Behavior*, 114, 106584.

- 3. Abbas, S. K., Hassan, H. A., Asif, J., Ahmed, B., & Haider, S. S. (2018). Integration of TTF, UTAUT, and ITM for mobile banking adoption. *International Journal of Advanced Engineering, Management and Science (IJAEMS) Vol-4, Issue-5*.
- 4. Belmonte, Z. J. A., Prasetyo, Y. T., Cahigas, M. M. L., Nadlifatin, R., & Gumasing, M. J. J. (2024). Factors influencing the intention to use e-wallet among generation Z and millennials in the Philippines: An extended technology acceptance model (TAM) approach. *Acta Psychologica*, 250, 104526.
- 5. Creswell, J. W., & Creswell, J. D. (2017). Research design: Qualitative, quantitative, and mixed methods approaches. Sage publications.
- 6. Del Sarto, N., & Ozili, P. K. (2025). FinTech and financial inclusion in emerging markets: a bibliometric analysis and future research agenda. *International Journal of Emerging Markets*, 20(13), 270-290
- 7. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340.
- 8. Geebren, A., Jabbar, A., & Luo, M. (2021). Examining the role of consumer satisfaction within mobile eco-systems: Evidence from mobile banking services. *Computers in Human Behavior*, 114, 106584.
- 9. Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2019). Multivariate data analysis.
- 10. Hassan, M., Qureshi, M. A., & Abbasi, A. N. (2020). Acceptance of Mobile Banking (MB) Framework in Pakistan-A Systematic Review. *JISR management and social sciences & economics*, 18(1), 37-52.
- 11. Khan, W. A., & Abideen, Z. U. (2023). Effects of behavioural intention on usage behaviour of digital wallet: the mediating role of perceived risk and moderating role of perceived service quality and perceived trust. *Future Business Journal*, *9*(1), 73.
- 12. Kazi, A. K., & Mannan, M. A. (2013). Factors affecting adoption of mobile banking in Pakistan: Empirical Evidence.
- 13. Mustafa, S. H., & Khan, A. A. (2025). Impact of Mobile Banking on Customer Satisfaction: Evidence from Pakistan's Banking Sector. *The Critical Review of Social Sciences Studies*, *3*(1), 3915-3921.
- 14. Mazhar, F., Rizwan, M., Fiaz, U., Ishrat, S., Razzaq, M. S., & Khan, T. N. (2014). An investigation of factors affecting usage and adoption of internet & mobile banking in Pakistan. *International Journal of Accounting and Financial Reporting*, 4(2).
- 15. Shahzad, N., Khuram, H. R., Tshung, F. C. C., & Nawaz, S. (2023). Impact of Reward and Recognition on Employees Motivation in Banking Sector. *Res Militaris*, 13(3), 2112-2122.
- 16. Sikandar, A. (2025). Digitalization and its Impact on Developing Economies: A Case Study of Pakistan's Banking Sector. *Intersect: The Stanford Journal of Science, Technology, and Society*, 18(2).
- 17. State Bank of Pakistan (SBP). (2023). National financial inclusion strategy progress report 2023. State Bank of Pakistan. https://www.sbp.org.pk
- 18. State Bank of Pakistan (SBP). (2024). Payment systems review 2023-24. State Bank of Pakistan. https://www.sbp.org.pk
- 19. Roomi, M. A., Rehman, S., & Henry, C. (2018). Exploring the normative context for women's entrepreneurship in Pakistan: a critical analysis. *International Journal of Gender and Entrepreneurship*, 10(2), 158-180.



- 20. Ullah, S., Kiani, U. S., Raza, B., & Mustafa, A. (2022). Consumers' intention to adopt m-payment/m-banking: the role of their financial skills and digital literacy. *Frontiers in Psychology*, 13, 873708.
- 21. Umair, T., & Butt, S. (2025). Adoption of Mobile Banking Apps and their Behavioral Impacts on Millennials in Digital Age: Evidence from Developing Country Perspective. *Indus Journal of Social Sciences*, 3(1), 404-419.
- 22. Yazdi, A. K., Hanne, T., & Osorio Gómez, J. C. (2021). A hybrid model for ranking critical successful factors of Lean Six Sigma in the oil and gas industry. *The TQM Journal*, 33(8), 1825-1844.
- 23. Zohra, Z., & Kashif, K. (2011). Mobile banking adoption in banking sector of Pakistan. *Journal of Yasar University*, 6(21), 39-42
- 24. Zia, D. S. ., Tshung, F. C. C. ., & Shahzad, N. . (2024). Examining Challenges In Mobile Banking: Insights From The Consumer's Perspective. *Migration Letters*, 21(S7), 1378-1395.