

## Technology Adoption, Customer Experience, and Innovation Performance in the Banking Sector of Pakistan

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### ABSTRACT

*The blistering development of digital technologies has considerably redefined the organization and the operation of the banking sector of the world. Over the past few years, banks have been turning to technological inventions to streamline their efficiency in services, improve customer relationship as well as their competitive advantage. The banking industry in Pakistan undergoes a significant digital change that is marked by the introduction of mobile banking, internet banking, automated service platforms, artificial intelligence-based customer support, and fintech collaboration. This paper examines how technology adoption, customer experience and innovation performance are correlated with the banking industry of Pakistan. The study is based on the Technology Acceptance Model, the Resource-Based View, and the Service-Dominant Logic to argue that successful utilization of technology has a positive impact on customer experience, and this impact leads to innovation performance in banks. The suggested research design is a quantitative one as the investigator will target both public and private sector bank customers and employees in Pakistan. The results should be relevant to the current body of literature as they will provide a comprehensive framework that will explain how technology-mediated customer experiences create innovation performance in developing economies. In practice, the research offers information to bank managers and policymakers to develop customer-focused digital strategies that can help them contribute to sustainable innovation and long-term development in the Pakistani banking industry.*

**Keywords:** Technology Adoption, Customer Experience, Innovation Performance, Banking Sector, Pakistan.

### INTRODUCTION

The banking sector has experienced a radical change in the last 20 years in terms of the swift technological advancement and increased globalization. In digitalization, the traditional banking models have been transformed by redefining the production, delivery, and consumption of the financial services. The contemporary consumer wants smooth, customized and effective banking services and this forces banks to embrace new technologies to handle their changing needs (Lemon and Verhoef, 2016).

Following this, technology adoption has become a vital customer satisfaction determinant, operational effectiveness and innovation performance determinant in financial institutions.

The concept of technology adoption in the banking sector can be defined as the process of integrating and using digital tools like mobile apps, online banking services, automated teller machines, AI, and data analytics to make services delivery and decision-making easier. The Technology Acceptance Model suggests that the usefulness and ease of use of new technologies play a significant role in the acceptance of new technology by the users (Davis, 1989). With regards to banking, customers are more willing to use digital services when they are trustworthy, safe, and convenient as a user. As a result, the banks, which effectively embrace technology, are able to engage their customers better, and build long-term relationships.

In Pakistan, the banking sector is at the centre stage of supporting economic development and financial inclusion. In the past ten years, the State Bank of Pakistan has promoted the development of digital banking to minimize the cost of the transactions and increase people's access to financial services, in particular, in underserved regions (State Bank of Pakistan, 2022). Mobile wallets, real-time payment systems, and branchless banking are the result of the increased significance of technology-based financial services. Nevertheless, even with these changes, there are still numerous banks that have low customer trust, poor digital literacy, and poor quality of services, and these factors make it difficult to make good use of technology.

Customer experience has been receiving a growing focus as a strategic priority in the banking industry. It takes into account the cognitive, emotional and behavioural reactions of customers as a reaction to their engagement with banking service in a variety of touchpoints (Lemon and Verhoef, 2016). A positive customer experience has been an important differentiator to banks in a highly competitive environment. The digital technologies can make the services of banks personalized, decrease delays with the services, and offer 24/7 service, which will enhance the overall customer experience. The use of previous studies raises the idea that a better customer experience results in a greater level of customer satisfaction, customer loyalty, and word-of-mouth which are crucial to organizational success (Klaus and Maklan, 2013).

Innovation performance can be defined as the capacity of an organization to bring new services, enhance the existing processes and react quickly on the change of the market. Innovation performance in the banking sector can be measured in terms of the creation of new digital products, the implementation of fintech solutions, the active enhancement of the customer service process. Technology and customer-centric capabilities based on the lens of the Resource-Based View are both good strategic resources with which firms can attain sustainable competitive advantage (Barney, 1991). Banks that utilize technology to improve customer experience are in a better position to innovate and be able to adjust to the dynamic market conditions.

The connection between technological adoption, customer experience, and the performance of innovation is quite considerable in emerging economies like Pakistan like the technological infrastructure and customer preparedness are different. Although customers experience has been studied in the context of banking in relation to the adoption of technology and the quality of services, there is minimal research on customer experience mediating the relationship between technology adoption and innovation performance in the Pakistani context. This gap indicates the necessity of a thorough research that will incorporate these constructs in an analytic framework.

Furthermore, the conditions after the pandemic have aggravated the dependency on digital banking platforms, and technology adoption is no longer optional to keep providing the services and maintaining customer retention. Those banks that failed to innovate in this time had their operations interrupted as

well as their customer satisfaction being impacted. Thus, to develop effective digital transformation strategies, it is important to learn how customer experience based on technology can help in enhancing innovation performance.

This research is set to fill these knowledge gaps by investigating the change in customer experience and innovation performance in the banking industry of Pakistan as a result of technology adoption. Through the presentation of empirical evidence, the research is aimed at contributing to the theoretical knowledge and providing practical implications to bank managers, policymakers and regulators. The results will help build customer-oriented digital policies to facilitate innovation, efficiency, and sustainable expansion in the banking sector in Pakistan.

### **LITERATURE REVIEW**

The increasing adoption of digital technologies has transformed the banking sector in the world in major ways in terms of its structure and performance. It is generally accepted by academics that technology adoption is now a mainstream source of competitiveness, service efficiency and innovation with financial institutions (Venkatesh et al., 2012). Technology adoption in the banking setting is the level of adoption and usage of digital instruments by banks through mobile banking, internet banking, artificial intelligence, data analytics, and automated service systems to enhance operational processes and customer interactions. The past study indicates that banks with modern technologies are more likely to adapt to the market dynamics and changes in customer demands (Zhao et al., 2020).

Theoretical premise of technology adoption in banking is to a very large extent pegged on the Technology Acceptance Model in which the theory theorizes the influence of perceived usefulness and ease of use as major determinants of technology acceptance (Davis, 1989). This model has been used in several empirical studies to investigate the adoption of digital banking services by customers. As an example, Rahi et al. (2019) established that the perceived usefulness has a strong and significant impact on the intention of customers to use mobile banking services in developing economies. On the same note, Alalwan et al. (2017) conducted a study that found out that the quality of systems, security and trust are important factors that influence the acceptance of online banking technologies among customers. These results mean that the adoption of technology is not only a technical challenge but is highly conditioned by the perception of the customers and their experience.

In the developing world like Pakistan, technology adoption in banking has been on a high speed because of the regulatory aid and the growing penetration of smartphones. The State Bank of Pakistan has been an active advocate of using digital financial services to increase financial inclusion and minimize operational inefficiencies (SBP, 2022). Nonetheless, the efficiency of such technologies in supporting customer experience and innovation performance is not balanced even after becoming more widely adopted. According to some studies, technological investments do not necessarily translate into better performance unless the investment is tied to the needs of the customer and the ability of an organization (Zhang et al., 2018).

The concept of customer experience has become a key construct in the interpretation of the consequences of using technology. Customer experience refers to the overall perceptions that customers have due to relationships with banking services at both physical and digital touchpoints (Lemon & Verhoef, 2016). Customer experience is a complex emotional, cognitive, and behavioral measure in comparison to traditional approaches like customer satisfaction, since it considers all customer responses during the customer journey. There are digital interfaces like mobile apps, websites, and chatbots as the main touchpoints in the banking industry that influence customer experience.

The available literature raises the issue that the adoption of technology impacts the customer experience in a great way, making the services more accessible, fast, personalized, and convenient. According to Klaus and Maklan (2013), digital technologies can also help banks create an experience that is seamless and consistent to build trust and engagement in the customers. The results of the empirical studies on Asian banking markets indicate that more customer satisfaction and loyalty are learned by those customers who believe that digital banking services are both reliable and customer-friendly (Ho and Ko, 2008). It means that efficient use of technology may become a trigger of positive customer experiences.

Customer experience in banking is one of the emerging fields of research in Pakistan. Research shows that although customers are pleased with the convenience of digital banking, they still have some concerns that involve the reliability of the systems, security of the information, and responsiveness of the services (Iqbal et al., 2018). These difficulties may have a negative impact on the general experience of the customers and restrict the possible benefits of technology use. Hence, it is necessary to comprehend how the adoption of technology influences customer experience to enhance service delivery in the Pakistani banking industry.

Another important outcome of technology adoption and customer experience is represented by innovation performance. Innovation performance is the response to the market needs by a firm through developing new products and services and introducing new business models (Wang and Ahmed, 2004). In the banking sector, innovation performance can be manifested through the establishment of digital payment instruments, fintech partnerships, customized financial offerings, and analytics-based decision-making. Researchers believe that the innovation performance plays an important role in determining long-term sustainability in the financial services sector that is highly competitive.

According to the Resource-Based View, technological capabilities and customer-oriented practices are the organizational resources that can be valued as to their improvement of the innovation performance (Barney, 1991). Customer data can be used by banks to identify new demands and create new solutions, in case the banks are effective in incorporating technology into their business. The evidence obtained previously indicates that there is a positive correlation between technological adoption and innovation performance in financial institutions (Hameed et al., 2021). The effectiveness of using technology to improve customer contact and service quality however is what determines the strength of this relationship.

Customer experience is becoming known as a mediating variable that facilitates the impact of the use of technology on the innovation performance. Service-Dominant Logic postulates that the process of co-creation of value in service interactions between providers and the customers is important to the customer experience and hence the innovation results (Vargo and Lusch, 2008). As banks adopt technology to enhance customer experience, they will acquire information on what the customers want and how they behave thus can be used to innovate on services. This is because better innovation results will be experienced by firms that proactively manage customer experience (Lemon and Verhoef, 2016).

Empirical evidence can prove the intervening role of customer experience in technologyperformance relationship. As an example, Chen and Lin (2019) revealed that in financial services companies, digital service quality positively impacts the performance of innovation because of improved customer experience. In the same vein, research that has been done in the developing markets shows that customer experience is a mediator that partially relates digital transformation and organizational performance (Khan et al., 2022). The findings are important in highlighting the strategic nature of customer experience in converting the technological investment to the gain of innovation.

Although an increasing body of evidence suggests the relationship between technology adoption, customer experience, and innovation performance, few studies have identified the integrated relationship,

as information has concentrated on the banking industry in Pakistan. The majority of studies which exist are centered on the technology adoption or customer satisfaction, and it frequently overlooks innovation performance as a result variable. In addition, the majority of studies have a disjointed focus, which does not imply the concept of customer experience as a key explanatory variable. This is an especially important gap, considering the socio-economic specifics of Pakistan, in which the level of digital literacy, the infrastructural boundaries, and the cultural aspects determine the relationships the customers have with the banking technology.

More recent researches also indicate that organizational culture, regulatory environment, and readiness of the customers among contextual factors are important in determining the success of technology adoption in banking (Zhao et al., 2020). The relationship between customer experience and technology adoption is further complicated in Pakistan where there are differences between rural and urban banking customers. Whereas customers in the urban settings can find it easy to implement digital services, rural customers are usually constrained by access and trust issues, this is likely to suppress the results of innovation.

The COVID-19 pandemic also emphasized the need to have digital technologies to ensure continuity in banking business and relationships with clients. Those banks which had already invested in digital platforms were better placed to respond to the disruption and bring in new solutions to their services (KPMG, 2021). This time strengthened the claim that the implementation of technology, which is consistent with customer experience, improves the performance of innovation and resilience within an organization.

To conclude, the current literature has substantially supported the fact that technology adoption is positively related to customer experience and innovation performance in the banking industry. It is however, a complicated and conditional relationship especially in developing economies like Pakistan. The customer experience becomes a major mediating factor that connects technology capabilities and the results of innovation. The absence of empirical research incorporating all these constructs in Pakistani banking setting indicates a gap in the research. The comprehension of this gap can add to theoretical progress and offer practical implications to the banks that aim at capitalizing on technology to achieve customer-focused innovation and sustainable competitive advantage.

## **METHODOLOGY**

### **Research Design**

In this study, a quantitative research design is applied in exploring the relationship between technology adoption, customer experience and performance regarding innovation in the banking industry of Pakistan. The survey research is carried out using a cross-sectional survey approach to gather primary data on the customers and employees of the banking industry in AJK. Quantitative design is deemed suitable because it can be used to test hypotheses of relationships between variables statistically and is also able to generalize the results to the banking industry.

### **Theoretical Framework**

The research is based on the Technology Acceptance Model (TAM), Resource-Based View (RBV) and Service-Dominant Logic (SDL). TAM describes how users accept banking technologies in terms of usefulness and ease of use, RBV focuses on technology and customer-centric capabilities as strategic resources, and SDL focuses on customer experience as a value co-creation process that drives innovation performance. All these theories present a strong background to analyzing the intended relationships.

### **Population and Sampling**

The sample of the research will include customers and employees of the customers and employees of the banks serving in the public and the private sector in Pakistan. Multi-stage sampling technique is used. First, there are large state and private banks from AJK are chosen. Second, the respondents will be selected through the convenience sampling method because of the limitation of accessibility. This strategy is similar to the previous banking studies carried out in the developing economies. According to Hair et al. (2019), a sample of 300 respondents is recommended in order to implement Structural Equation Modeling (SEM).

### **Data Collection Method**

The structured, self-administered questionnaire is used in collecting primary data. The questionnaire will be administered in physical and electronic format to guarantee the increase of the response rate. The respondents will be told regarding the aim of the study, and the confidentiality of the responses will be guaranteed. Participation is optional and ethical issues are highly taken into considerations during the data collection process.

### **Measurement of Variables**

Adoption of technology is calculated through the use of items derived based on the previously validated research on perceived usefulness, ease of use and reliability of the system of digital banking services. Customer experience is gauged based on dimensions of quality of service, convenience, personalization, and emotional involvement, which are modified versions of the existing customer experience scales. The performance of innovation is measured with reference to service innovation, process improvement, and presentation of new digital products. The measurement of all items will be based on a five-point Likert scale of strongly disagree, strongly agree.

### **Instrument Reliability and Instrument validity.**

Expert review and pilot testing are done to ensure content validity of the instrument. Cronbach alpha is used to determine the reliability of the constructs and anything above 0.70 is acceptable. Construct validity is determined by using confirmatory factor analysis (CFA) and measuring convergent and discriminant validity based on factor loadings, average variance extracted (AVE) and composite reliability (CR).

### **Data Analysis Techniques**

Statistical Package of the Social Sciences (SPSS) and AMOS/SmartPLS are the used data analysis programs. The demographic of the respondents is summarized through the application of descriptive statistics. The correlations among the variables are conducted through correlation analysis. SEM is used to test the relationships to be established in the hypothesis and the mediating effect of experience with customers between adoption of technology and innovation performance. Goodness of fit is measured by the use of model fit indices like CFI, TLI, RMSEA, and Chi-square/df.

### **Ethical Considerations**

Ethics are observed during the study. The anonymity and confidentiality of the respondents are guaranteed and the information is only utilized in academic settings. All the participants are informed about their involvement in the study and no personal or sensitive information is revealed.

### **DATA ANALYSIS AND FINDINGS**

The research findings were analyzed with the SPSS statistic to confirm the association between technology adoption, customer experience, and innovation performance in the banking industry of Pakistan with 300 respondents. These analyses are demographic analysis, descriptive statistics, reliability analysis, correlation analysis and structural relationship analysis. This methodology is designed to guarantee the strength and reliability of the results.

### Demographic Analysis

The demographic variables of the respondents are provided in Table 1. The sample is made up of 300 respondents in both the public and the private sector banks.

**Table 1: Profile of the Respondents (N = 300)**

Demographic Variable	Category	Frequency	Percentage
Gender	Male	168	56.0%
	Female	132	44.0%
Age	20–30 years	126	42.0%
	31–40 years	96	32.0%
	41–50 years	54	18.0%
	Above 50	24	8.0%
Bank Type	Public	138	46.0%
	Private	162	54.0%

The demographic findings show that there is a balanced representation of the respondents in terms of gender and the type of bank. Most of the respondents are also in the 20-40 age group indicating that younger and middle-aged customers and staffs are more actively using the digital banking services. This distribution justifies the applicability of technology adoption in the development of customer experience and innovation outcomes.

### Descriptive Statistics

Descriptive statistics were calculated to evaluate the perception of the respondents about the technology adoption, customer experience, and performance on innovations.

**Table 2: Descriptive Statistics**

Variable	Mean	Standard Deviation
Technology Adoption	4.12	0.61
Customer Experience	4.05	0.66
Innovation Performance	3.98	0.70

The averages show that the respondents are mostly satisfied that the banks in Pakistan are not only adopting modern technologies, but they are also giving satisfactory customer experiences. The highest mean value is recorded in technology adoption which depicts the positive perception of the respondents towards digital banking services. The mean of innovation performance is also relatively high which shows that technological initiatives are yielding service and process innovation in the banking sector.

### Reliability Analysis

Cronbach alpha was used to measure reliability of the measurement scales to achieve internal consistency.

**Table 3: Reliability Analysis**

Construct	Number of Items	Cronbach's Alpha
Technology Adoption	6	0.86
Customer Experience	7	0.88
Innovation Performance	5	0.84

All constructs display Cronbachs alpha more than the recommended 0.70 which proves the reliability of the measurement tools. This goes to show that the measures employed in measuring each of the constructs are internally consistent and can be analyzed further.

**Correlation Analysis**

The Pearson correlation analysis was done to identify the level and direction of association between the variables of the study.

**Table 4: Correlation Matrix**

Variables	1	2	3
1. Technology Adoption	1		
2. Customer Experience	0.62**	1	
3. Innovation Performance	0.58**	0.65**	1

**Note:  $p < 0.01$**

The findings also demonstrate that technology adoption has a strong and positive relationship with customer experience ( $r = 0.62$ ), indicating that the more a bank uses digital technologies, the higher the perception of the customers regarding the banking services. Innovation performance also has a strong positive correlation with technology adoption ( $r = 0.58$ ). In addition, the capability of the banks in terms of innovation ensures that customer experience is closely related to innovation performance ( $r = 0.65$ ), which underscores its essential role in the innovation process among banks.

**Structural Relationship Analysis or Regression.**

Regression analysis was undertaken to analyze the effect of the adoption of technology on customer experience and innovation performance.

**Table 5: Regression Results**

Relationship	Beta ( $\beta$ )	t-value	p-value
Technology Adoption → Customer Experience	0.62	11.45	0.000
Technology Adoption → Innovation Performance	0.34	6.98	0.000
Customer Experience → Innovation Performance	0.49	9.12	0.000

The results of the regression indicate that the impact of the technology adoption on customer experience is significant and positive, which contributes to the idea that digital tools can improve the quality of the service and make it more convenient. The impact of technology adoption on innovation performance is also significant, but it is less significant than the one of the adoption itself. Customer experience has a high positive impact on the innovation performance, meaning that those banks with better customer experiences receive higher levels of innovation.

**Mediation Analysis**

SEM/regression-based mediation analysis was used to test the mediating role of customer experience between innovation performance and technology adoption.

**Table 6: Mediation Results**

<b>Effect</b>	<b>Beta (β)</b>	<b>p-value</b>
Direct Effect (TA → IP)	0.34	0.000
Indirect Effect (TA → CE → IP)	0.30	0.000
Total Effect	0.64	0.000

The mediation findings affirm that customer experience mediates the connection amid technology adoption and innovation performance partially. It means that, although technological implementation directly promotes the innovation performance, a significant part of its effects is achieved due to the better customer experience. These results can be associated with the Service-Dominant Logic, which focuses on the value co-creation using interactions with customers.

All in all, the results indicate that the adoption of technology is essential in the performance of the banking industry in Pakistan in terms of customer satisfaction and innovation. The findings affirm that customer experience is an important process that transforms technological investments into innovative outputs. Banks that successfully use digital technologies to enhance customer relationships would have higher chances of attaining sustainable innovation and competitive advantage.

**DISCUSSION**

The results of the current research can be used to substantiate the high-empirical evidence of the relevance of technology adoption in determining customer experience and innovation performance in the Pakistani banking industry. The strong correlation observed between technology adoption and customer experience is positive suggesting that the use of digital banking tools like mobile application, internet banking systems, and automated services have positively impacted the perception of customers to the quality, convenience, and responsiveness of the services. This finding is also in line with previous researches that suggest that perceived usefulness and the level of ease of use are both vital factors that determine the level of customer engagement with banking technologies (Davis, 1989; Venkatesh et al., 2012). In the case of the Pakistani setting where customers are increasingly using digital channels to transact daily business, the adoption of effective technologies seems to decrease the delays during service provision and enhance satisfaction generally.

The research also indicates that there exists a strong positive correlation between innovation performance and technology adoption meaning that banks investing in digital technologies can introduce new services better and can improve operational processes and respond to any change in the market. This observation is consistent with the dependence of the Resource-Based View where technological competences are considered as strategic resources that contribute towards organizational innovation and competitiveness (Barney, 1991). Banks in Pakistan which have integrated fintech solutions and data-driven systems are more flexible in service delivery and product development, which leads to improved innovation outcomes.

More importantly, the findings substantiate the mediating role played by customer experience in the connection between technology adoption and innovation performance. The partial mediation effect shows that as much as technology adoption directly affects the performance of innovation, a significant part of it is mediated by improvement of customer experience. This conclusion confirms the Service-Dominant Logic that accentuates the importance of value co-creation in the context of organizational interactions

with customers (Vargo and Lusch, 2008). By using technology to provide personalized, reliable and efficient services, banks have access to valuable insights about their customers that would enable innovation. This means that technology is not the only determinant of innovation but it should be utilized in a way that it is utilized to improve the customer experience.

The results are especially relevant in the Pakistani banking industry where the digital transformation is still developing and customer trust is the issue. Despite intense investments by banks into technology, the lack of uniformity in service quality and reliability of systems can compromise customer experience and restrict the innovativeness. The close relationship between the customer experience and innovation performance underscores the importance of banks concentrating on customer-centric digital approaches instead of concentrating on technological infrastructure. These findings are novel to the literature as they offer the empirical data on technology use in a developing economy, as well as combine technology use, customer experience, and innovation performance into a single analytical unit.

## **CONCLUSION**

This paper finds that the technology adoption is an essential contributor of customer experience and innovation performance in the banking industry of Pakistan. The empirical evidence shows that banks that embrace developed digital technologies have high chances to provide better customer experiences, which subsequently increase their innovativeness. Customer experience becomes one of the main ways by which technological investments can be converted into the outcomes of innovations. The research adds to the body of knowledge by emphasizing the role of technology and customer experience in spurring innovation performance especially in a developing country environment. In general, the results indicate that sustainable innovation in banking cannot be realized with the help of technology adoption only, but it should be approached with a strategic emphasis on customer experience improvement.

## **RECOMMENDATIONS**

According to the findings, the recommendation is that the banks in Pakistan should be customer-focused in their digital transformation and implementation of digital initiatives through matching the customer needs and expectations. By making customer experience better, banks should invest in digital solutions that are easy to use, with a robust system and enhance their cybersecurity protocols. Bank employees should also be trained constantly to facilitate successful implementation and use of digital technologies. In addition, banks can use customer data analytics to comprehend customer behavior and develop new innovative services based on the different categories of customers. Policymakers and regulators are urged to facilitate digital innovation by encouraging financial literacy and ensuring that the regulatory environment helps in technological development and protect consumers.

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