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IMPACT OF CUSTOMER TRUST ON DIGITAL WALLET ADOPTION: EXAMINING THE ROLE OF BIG DATA ANALYTICS CAPABILITY IN PAKISTAN

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Abstract

The rapid evolution of financial technology has ushered in a transformative era for digital wallet adoption globally, with Pakistan emerging as a significant market for digital financial inclusion. While customer trust is empirically recognized as a fundamental driver of digital finance adoption, the technological conditions that amplify this relationship remain inadequately understood. This study addresses this gap by examining how Big Data Analytics Capability (BDAC) moderates the relationship between customer trust and digital wallet adoption, drawing upon the Technology Acceptance Model (TAM) and Resource-Based View (RBV) theoretical frameworks. Employing a quantitative research design, data were collected from 182 active users of Easypaisa, JazzCash, and Nayapay in Pakistan through a structured questionnaire. The findings reveal that customer trust significantly and positively influences digital wallet adoption ($\beta = 0.610$, $p < .001$), and BDAC demonstrates a strong direct relationship with adoption ($\beta = 0.604$, $p < .001$). However, contrary to expectations, BDAC did not exhibit a statistically significant moderating effect on the trust-adoption relationship ($\beta = 0.066$, $p = .192$), suggesting that in Pakistan's nascent digital financial ecosystem, trust and organizational analytics capabilities operate as independent drivers rather than synergistic forces. The study contributes theoretically by extending TAM to incorporate trust and organizational capability dimensions within a developing economy context. Practically, the findings underscore the imperative for FinTech operators to invest simultaneously in trust-building mechanisms and robust analytical infrastructure, while policymakers are encouraged to develop regulatory frameworks that balance innovation with consumer protection. This research advances understanding of digital financial services adoption in emerging markets and provides actionable insights for stakeholders seeking to accelerate Pakistan's digital economy transformation.

Keywords: Digital Wallet Adoption, Customer Trust, Big Data Analytics Capability, FinTech, Technology Acceptance Model, Resource-Based View, Pakistan

1. Introduction

1.1 Background of the Study

Over the past 10 years, the global financial landscape has changed quickly due to the growth of digital technology. Some of the well-known innovations are digital wallets, which have drastically changed the

consumer's financial transactions. Through a digital wallet, an authorized user can store payment information and make payments via a smartphone or other digital device. According to Oliveira et al. (2016), the rate of consumers' adoption of digital wallets is on the rise in both developed and developing economies. This is mainly because of increasing smart device and internet penetration besides financial inclusion initiatives. The worldwide adoption of Digital Wallet has reached unprecedented levels, particularly in the Asia-Pacific (APAC) region, North America, and Europe. Digital wallets assist individuals without technical skills in accessing essential formal financial systems and services like loans and credit. Digital wallets in Pakistan, India, diverse geographies and parts of Africa are available in numerous emerging markets. Mobile wallets and other digital payment instruments are one of the recent important developments for the financial inclusion growth of Pakistan having an estimated population of 220 million out of which nearly 53% are unbanked (Salman et al., 2024). With the availability of app-based platforms such as Easypaisa, JazzCash and Nayapay the important transactions can take place through mobile phone without the conventional bank account of mobile phone holder.

The institutions above assist in carrying out domestic remittance, bill payment, mobile phone recharging and e-commerce transactions thereby promoting financial inclusion (Khan et al., 2025). There is a substantial gap in the levels of adoption across regions. Consumer adoption of the digital wallet technology is multifaceted as there are various behavioural, technological and institutional aspects which influenced the adoption (Slade et al., 2015). Trust of the customer is very important for the adoption of the digital wallet. Trust plays an important role in a financial transaction, especially which is conducted in a digital medium. In simple words, the trust in the digital wallet is the confidence that the user has that the service provider is secure, dependable, and honest. The data must be private, the transaction secure, the system reliable, and the fraud must be protected. Past studies have highlighted the importance of trust to effectuate the intention of using digital financial service (Kim et al., 2008; Zhou, 2013).

For developing economies, in particular, however, there have always been barriers to adoption – cyber-attacks, breaches of data, and misuse of private information. Although customer confidence is significant, it may not be enough to determine digital wallet differences. Fights have become an important part of our school and college life. Everyone's got to pay the price. At least once in their life, everyone must have fought. Otherwise, you're just an exception. Students get into a lot of fights due to different reasons. It could be anything related to personal or behavioural. But as we are students, it is very important to handle them with care. We should come up with peaceful ways to solve problems

It is clear that the organizations receive benefits from big data analytics. To begin with, it secures fraudulent transactions through quick detection and manages risk using analytics. Another advantage of big data analytics is that it able to create a more personalized experience for the customers. The third benefit of big data analytics is that it enhances the decision-making process by making patterns and trends visible. The benefits lead to better improvement in the performance of operations, the development of better relations with the customer and improvement in trust in digital platform (Akter & Wamba, 2016; Wamba et al., 2017). To gain insight into the relationship, this study adopts a Technology Acceptance Model (TAM) and Resource-Based View (RBV) perspective.

The Technology Acceptance Model (TAM) explores how users change behaviour in relation to the perceived level of usefulness and perceived level of ease-of-use Davis, 1989; Venkatesh et al, 2003. In contrast, the Resource-Based View (RBV) focuses on firm-specific capabilities that can create a sustainable competitive advantage (Gupta & George, 2016). This study combines these frameworks to provide an overview of the influence of technology capabilities on the association between trust and fintech adoption.

Dissemination of this knowledge is via academic essays through journal publication. According to the study, big data needed to improve digital ecosystems for better user experience must be invested in. In the end, as adoption of digital wallets becomes increasingly global, consumer confidence is key aside from the technology efficiency used. This research addresses this gap by examining the relationship between trust, big data analytics capability and adoption of digital wallets. Also, it will speed up the global digital financial services like never before.

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1.2 Problem Statement

Many people in urban Pakistan still use cash a lot due to their behaviour. Though digital finance has spread quickly across urban areas, yet it cannot be denied that they continue relying on cash for major transactions. Users tend to shy away from moving on from conventional money as they often suffer from recurring anxieties, which relates back to the visibility which won't come up as a problem and not feeling secure in the context of online fraud, data breach and their erratic after services. As per the base literature, Trust and perceived security has been understood to directly aid the mobile wallet adoption but Trust being very fragile to Service quality, system friction etc. This creates a gap which creates an analytical scope: How FinTech players can convert psychological trust into consistent and repeated usage habits of digital transactions. Earlier models often consider user trust a static perception, ignoring the active back end analytical tools companies use to secure, customize and stabilize digital spaces. Digital environment is lacking fidelity and as a result there is a lack capitalization of trust.

By suggesting the moderating effect of Big Data Analytics Capability (BDAC), this study fills this gap. Our study demonstrates the ability advanced analytics deployment to protect user data, reduce risk and increase certainty that negatively mitigates the enhancing effect of trust on wallet adoption in Pakistan.

1.3 Research Objective

1. How does the trust of the customer affect the adoption of Digital Wallets?
2. What is the link between BDAC and the acceptance or usage of digital wallets?
3. Does BDAC play a significant role in the relationship between customer trust and digital wallet adoption?
4. What is the extent to which FinTech firms can use BDAC to increase customer trust and further encourage digital wallet adoption?

1.4 Problem statement

Digital wallets have rapidly spread in the world. These considerations continue to act as a barrier for more widespread adoption. Prior studies indicate that customers' trust is a significant motivator for digital wallet. There are not many studies that look at the technological capabilities of organizations in general and the BDAC in particular. Put differently, it is unclear whether and how BDAC enhances the effect of customer trust on the adoption of digital wallets. This research examines how BDAC influences the relationship between customer trust and the adoption of digital wallets.

1.5 Significance of the study

The digital wallet business is a fast-growing business worldwide. As per a report, the Indian digital payment segment will see more than Rs. 2,630 lakh Crore over the period 2023-2028 registering a CAGR of 20.2%. Firms must capitalize on the opportunity of launching their own digital wallet to cash in on this growing market and customer base. Customers must, however, first find out more information about the factors influencing the uptake of digital wallets.

2. Literature Review & Hypotheses Development

2.1 The Baseline Elements: Trust, Security, and Adoption

Digital financial transaction is mainly a perception whose effectiveness depends largely on the belief of the people involved in it. At base level, trust in the [Internet of Things (IoT)] involves two types of beliefs: in the data encryption/interface safety (the subject) and in the service provider's services (the object). Similarly, trust incorporates a safety net, such as regulators. Empirical studies conducted in Pakistan reveal that the view has merit. A quantitative study of Pakistani employees (N=350) in 2025 confirmed that consumer trust ($r=0.642$, $p<0.001$) and perceived security ($r=0.611$, $p<0.001$) are major drivers of digital financial adoption. The same goes for user issues, which have also dropped adoption trends from their highest value. When users see the transactions as safe and regulated, their anxiety around losing their assets goes down. Earlier studies have shown trust positively influences the user's behavioural intention to adopt and continue using digital payment technology. As per the findings of Kim et al. (2008), trust diminishes perceived risk and encourages consumers transactional electronic financing. Users prefer to use a piece of technology they find useful and reliable as per TAM theory (Davis, 1989). Trust deals with the concerns of users with respect to

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safety, privacy, and transaction reliability, Trust significantly influences the use of mobile payment systems, according to Oliveira et al. (2016). This helps users feel more confident in the service provider:

H1: *Customer trust has a positive and significant relationship with digital wallet adoption.*

2.2 Big Data Analytics Capability (BDAC) as an Enterprise Resource

Big data analytics capability is an organizational ability to gather, process, analyse, and utilize large masses of data to assist decision-making (Gupta & George, 2016). Big Data Analytics Capability (BDAC) represents an organization's capability to collect, clean, and process massive volumes of structured and unstructured data to extract actionable operational insights. In a mobile financial ecosystem, every transaction, location coordinate, and login attempt generate deep trace data. Companies with a strong BDAC can leverage this data to optimize user experience, profile risk, and detect systemic fraud.

By deploying machine learning models, providers can transition away from slow, manual transaction reviews toward automated, real-time threat detection. This backend agility naturally boosts service consistency, stabilizes operational uptime, and drives higher consumer satisfaction. Organizations with better analytics capabilities are better able to increase efficiency and customer satisfaction (Wamba et al., 2017). Therefore, we propose:

H2: *Big Data Analytics Capability (BDAC) has a positive and significant relationship with digital wallet adoption.*

2.3 The Moderating Mechanics of BDAC

This study proposes that customer trust does not influence adoption in a vacuum; its impact is actively shaped by the service provider's data analytics capabilities. This kind of capability will increase customer confidence in the digital wallet platform (Gefen, 2003) and strengthen the impact of trust on adoption behaviour. A strong backend BDAC helps fulfil the implicit promises made to consumers through concrete security and personalization.

According to Akter and Wamba (2016), analytics capabilities that lead to personalization and service innovation positively impact customer satisfaction and foster long-lasting commitments. When users trust a digital platform, the degree to which that trust affects its usage is stronger to the extent that the provider uses data tools to make personalized finance recommendations, reduce system outages and instantly block frauds. On the flip side, a lack of sophisticated data analytics capabilities can erode end customer trust over time because of slow fraud rejection rates, generic interfaces, and glitches on security risks. All in all, it can be concluded that high BDAC will strengthen and anchor the positive link of trust with adoption behaviour.

H3: *Big Data Analytics Capability (BDAC) positively moderates the relationship between customer trust and digital wallet adoption, such that the relationship becomes stronger when BDAC is high*

2.4 Research Gap

Despite extensive research on digital wallet adoption and customer trust, many gaps exist. Most studies tend to focus on direct relationships as opposed to moderating effects. Few studies integrate BDAC with technological trust and adoption models, and there are few global or cross-sectoral studies, as almost all investigate specific isolated areas. Academics and practitioners need to further explore data-driven capabilities fostering trust-based adoption. As a result, the present study investigates the moderating role of BDAC between customer trust and digital wallet adoption.

3. Theoretical Framework

This study builds an integrated conceptual model by linking consumer behavioural theory with corporate capability frameworks, drawing directly on the Technology Acceptance Model (TAM) and the Resource-Based View (RBV).

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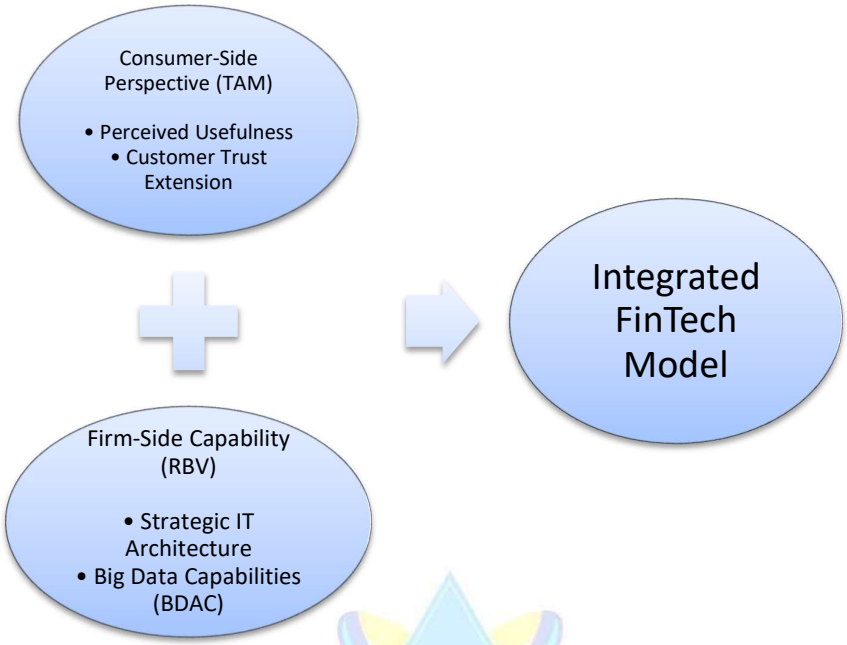
Figure 1
Theoretical Framework



3.1 Technology Acceptance Model (TAM) Extension

The Technology Acceptance Model (TAM) was created by researcher Fred Davis in 1989. His purpose is to demonstrate how users accept and use technology. (Davis, 1989) According to TAM, an individual's intention to use the system is influenced by usefulness and perception of the ease of use. Usefulness is defined as the extent to which a person believes that using a particular system would enhance his or her job performance while ease of use refers to the ease the user will obtain from using the system (Davis, 1989). As per TAM, these factors determine users' attitude about using the technology. This determines their behavioural intention, which in turn determines their actual usage behaviour. TAM2 and the Unified Theory of Acceptance and Use of Technology (UTAUT) were later developments of TAM. They included other variables, such as trust, social influence and facilitating condition (Venkatesh et al., 2003). Digital wallets have gained popularity in recent years for payments. The total addressable market shows rational behaviour for users who could use the digital wallet. Users mostly evaluate the speed, accessibility and convenience of digital wallet's contactless payment. When users perceive the digital wallet as useful and easy to use, they tend to adopt the digital wallet. As there is a high level of uncertainty and perceived risk, more TAM variables do not explain behaviour towards digital wallet" (Oliveira et al. 2016).

The contribution of consumer trust in research on digital financial services is based on the security, privacy and reliability issues faced by customers. According to literature, trust significantly enhances intention to use Mobile payment and e-wallets (Kim et al., 2008).

3.2 Resource-Based View (RBV)

The Resource-Based View (RBV) is a strategic management theory which explains how firms can achieve sustained competitive advantage through resources that are valuable, rare, inimitable, and non-substitutable (Barney, 1991). While the TAM addresses user perceptions, the Resource-Based View (RBV) provides the firm-side perspective, focusing on internal strategic capabilities. The RBV states that firms achieve a sustained competitive advantage by cultivating resources that are Valuable, Rare, Inimitable, and Non-substitutable (VRIN).

In modern digital ecosystems, standalone hardware and basic transaction apps are easily copied commodity assets. However, an integrated Big Data Analytics Capability which combines advanced analytical software, specialized data engineering talent, and a data-driven corporate culture serves as a true VRIN

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resource. This study applies the RBV framework by examining BDAC as a firm-level capability that amplifies the market value of customer trust, driving faster and more widespread digital wallet adoption.

3.3 Customer Trust Theory

The advancement of trust in risky environments depends heavily on trust theory. In digital settings where users cannot physically verify an online service provider, trust is an essential requirement. Customer trust is defined as the belief that a service provider will act reliably, safely, and ethically (Mayer et al., 1995). In digital wallet systems, trust is influenced by the safety of monetary transactions, protection of private information, payment system reliability, operational transparency, and adherence to rules. Trust serves as a safety net by diminishing perceived risk and uncertainty (Kim et al., 2008). Any feeling that a system is unsafe or violates privacy affects adoption behaviour negatively, making trust mechanisms like encryption and secure authentication critical parts of the operational independent profile.

3.4 Hypotheses Development

According to the theory, hypotheses can be made as follows.

H1: Customer trust is positively and significantly correlated to adopting a digital wallet.

H2: The capacity for big data analytics impacts the acceptance of digital wallets positively.

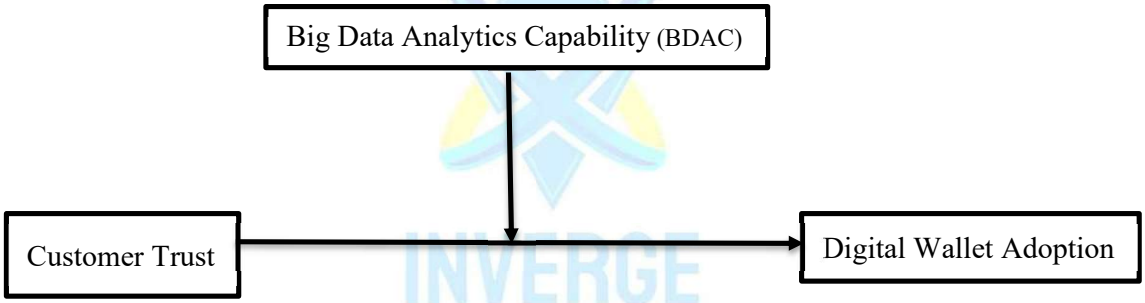
H3: Big Data Analytics Capability strengthens the effect of customer trust on digital wallet acceptance.

3.5 Conceptual Framework Model

In the model described above, customer trust is the independent variable, digital wallet adoption is the dependent variable, and Big Data Analytics Capability is the moderating variable.

Figure 2

Conceptual Framework



4. Research Methodology

4.1 Research Philosophy and Design

This study adopted a positivist research philosophy, grounded in the ontological assumption that an objective, measurable reality exists and can be investigated through empirical observation. Positivism aligns with the study's aim to quantify the causal relationships between customer trust, big data analytics capability (BDAC), and digital wallet adoption, as it emphasizes hypothesis testing, statistical generalization, and value-neutral inquiry.

The research followed a deductive approach; wherein theoretical propositions derived from the Technology Acceptance Model (TAM) and Resource-Based View (RBV) were translated into testable hypotheses and subsequently examined against empirical data. Methodologically, an explanatory, cross-sectional quantitative design was employed. This design was appropriate because the study sought to explain the extent and direction of influence among variables, as well as to test for moderation effects, rather than merely describing phenomena. Data were collected at a single point in time from a large sample of digital wallet users, enabling the application of inferential statistical techniques.

4.2 Target Population and Sampling Strategy

The target population comprised active adult users of digital wallet services in Pakistan. To ensure that respondents possessed relevant experience with the focal technology, a non-probability purposive sampling strategy was implemented. This approach was justified by the need to include only individuals who

had actually used a digital wallet, thereby enhancing the internal validity of the findings.

A screening question *"Do you currently use any digital wallet in Pakistan?"*—was placed at the beginning of the survey. Only respondents who answered affirmatively were allowed to proceed; non-users were automatically excluded. The digital wallets specifically referenced in the survey included Easypaisa, JazzCash, PayPal, Google Pay, and Apple Pay, reflecting the most commonly used platforms in the local context.

An electronic, self-administered questionnaire was distributed via professional networks, email, and mobile messaging platforms (e.g., WhatsApp and LinkedIn) to reach a diverse cross-section of users across various geographic regions and occupational sectors. The targeted sample size ranged between 150 and 200 respondents, a range sufficient to satisfy the statistical power requirements for multiple regression analyses. Ultimately, 182 valid responses were obtained, yielding a completion rate that exceeded the minimum threshold for reliable parameter estimation.

4.3 Data Collection Instrument and Measurement

All latent constructs, customer trust, big data analytics capability (BDAC), and digital wallet adoption, were measured using multi-item scales adapted from prior validated research to ensure content validity and reliability. Items were drawn from established instruments: trust items were based on Kim et al. (2008) and Mayer et al. (1995); BDAC items followed Gupta and George (2016); and adoption items were derived from Oliveira et al. (2016) and Venkatesh et al. (2003). Each item was scored on a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"), with higher scores indicating stronger agreement.

The questionnaire was structured into three sections: (i) demographic and usage characteristics (gender, age, education, monthly income, duration of wallet usage, and most frequently used wallet); (ii) the independent and moderating variables (trust and BDAC); and (iii) the dependent variable (digital wallet adoption). The instrument was pre-tested with a small pilot group of 20 digital wallet users to identify ambiguous wording and to assess clarity; minor revisions were made based on feedback before full deployment.

4.4 Analytical Procedures

Data analysis was performed using SPSS version 26 and the PROCESS macro for moderation analysis (Hayes, 2018). The analytical sequence comprised several rigorous stages:

1. **Descriptive Statistics**: Means, standard deviations, and frequency distributions were computed for all demographic and study variables to profile the sample and assess the central tendency and dispersion of responses.
2. **Correlation Analysis**: Pearson product-moment correlations were calculated to examine the bivariate relationships among trust, BDAC, and adoption. This step also served as a preliminary check for multicollinearity; correlation coefficients above 0.80 would have indicated potential issues.
3. **Regression and Moderation Testing**:
    - Simple linear regression was first conducted to test the direct effect of trust on adoption (H1), with the model summary evaluated using R^2, adjusted R^2, F-statistic, and Durbin-Watson statistics.
    - To test the moderating hypothesis (H3) and simultaneously assess the direct effect of BDAC (H2), Hayes' PROCESS Model 1 was employed. This model includes the interaction term (Trust × BDAC) alongside the main effects. The significance of the interaction term and the associated conditional effects were evaluated at bootstrapped 95% confidence intervals (5,000 bootstrap samples) to ensure robust inference.
4. **Supplementary Analyses**: A one-way ANOVA with Tukey's HSD post-hoc comparisons was performed to examine whether digital wallet adoption varied significantly across age groups, providing additional rigor to the demographic analysis.

All statistical tests were two-tailed, with a significance level set at $\alpha = 0.05$. Missing data were negligible; listwise deletion was applied, resulting in a final analytic sample of $N = 182$ for all analyses.

4.5 Ethical Considerations

The study adhered to ethical research principles. Participation was entirely voluntary, and respondents

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were informed about the purpose of the study, the anonymity of their responses, and their right to withdraw at any time without consequence. No personally identifiable information was collected, ensuring complete confidentiality. The survey received institutional approval from the research ethics committee of the National University of Modern Languages (NUML) prior to data collection.

5. Results and Analysis

This section presents the empirical findings derived from the quantitative data analysis. The results are organized sequentially, beginning with the demographic profile of respondents, followed by descriptive statistics, correlation analysis, hypothesis testing (including direct effects and moderation), and supplementary analyses.

5.1 Demographic Profile of Respondents

The demographic characteristics of the 182 respondents are summarized in Table 1. The sample comprised a majority of male participants (58.2%, n = 106). The predominant age group was 21–25 years (45.1%, n = 82), indicating a predominantly young user base. In terms of education, over half of the respondents held a Bachelor's degree (55.5%, n = 101). Most respondents reported a monthly income below PKR 30,000 (44.5%, n = 81), reflecting the socioeconomic profile of typical digital wallet users. Regarding usage duration, 40.7% (n = 74) had used digital wallets for more than 24 months, while Easypaisa emerged as the most frequently used wallet (63.7%, n = 116).

Table 1

Demographic Characteristics of Respondents (N = 182)

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	106	58.2
	Female	76	41.8
Age Group (Years)	16-20	38	20.9
	21-25	82	45.1
	26-30	36	19.8
	31-35	25	13.7
	Above 35	1	.5
Education Level	Matric	9	4.9
	Intermediate	30	16.5
	Bachelor's Degree	101	55.5
	Master's Degree	40	22.0
	PhD	2	1.1
Monthly Income (PKR)	Below 30,000	81	44.5
	30,000-50,000	30	16.5
	50,000-70,000	34	18.7
	70,000-90,000	14	7.7
	Above 90,000	23	12.6
Usage Duration	1-6 months	61	33.5
	6-12 months	19	10.4
	12-18 months	15	8.2
	18-24 months	13	7.1
	More than 24 months	74	40.7
Most Frequently Used Wallet	Easypaisa	116	63.7
	JazzCash	58	31.9
	Google Pay	5	2.7
	PayPal	3	1.6
	Apple Pay	0	0

5.2 Descriptive Statistics of Study Variables

Table 2 presents the descriptive statistics for the core study variables. The mean score for Trust was

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1.88 (SD = 0.813), while Adoption recorded a mean of 1.78 (SD = 0.752). BDAC yielded a slightly higher mean of 2.11 (SD = 0.885). The standard deviations, ranging from 0.75 to 0.89, indicate moderate variability in respondents' perceptions across all constructs, suggesting a reasonable distribution of responses. Notably, the screening variable (digital wallet usage) showed a mean of 0.83 (SD = 0.377), confirming that the vast majority of respondents were active users.

Table 2

Descriptive Statistics (N = 182)

Variable	N	Min	Max	Mean	Std. Deviation
Do you currently use any digital wallet in Pakistan?	182	0	1	.83	.377
Gender	182	0	1	.58	.495
Age	182	0	4	2.27	.953
Education Level	182	0	4	1.98	.793
Monthly Income	182	0	4	2.27	1.419
Usage Duration	182	0	4	3.11	1.774
Trust	182	0	4	1.8846	.81280
Adoption	182	0	4	1.7843	.75197
BDAC	182	0	4	2.1099	.88473
Valid N (listwise)	182				

5.3 Correlation Analysis

Pearson correlation coefficients were computed to examine the bivariate relationships among the constructs. As displayed in Table 3, all variables are significantly correlated with one another at the $p < 0.01$ level (two-tailed). Customer trust shows a strong positive correlation with digital wallet adoption ($r = 0.610$, $p < .001$). Trust is also positively correlated with BDAC ($r = 0.582$, $p < .001$), and BDAC correlates strongly with adoption ($r = 0.604$, $p < .001$). Importantly, none of the correlation coefficients exceed the threshold of 0.80, indicating that multicollinearity is not a concern for subsequent regression analyses.

Table 3

Correlations (N = 182)

Variable		Trust	Adoption	BDAC
Trust	Pearson Corr.	1	.610**	.582**
	Sig. (2-tailed)		.000	.000
	N	182	182	182
Adoption	Pearson Corr.	.610**	1	.604**
	Sig. (2-tailed)	.000		.000
	N	182	182	182
BDAC	Pearson Corr.	.582**	.604**	1
	Sig. (2-tailed)	.000	.000	
	N	182	182	182

**. Correlation is significant at the 0.01 level (2-tailed).

5.4 Hypothesis Testing

5.4.1 Direct Effect of Customer Trust on Digital Wallet Adoption (H1). Hypothesis H1 posited that customer trust has a positive and significant relationship with digital wallet adoption. A simple linear regression was conducted to test this hypothesis. Table 4 reveals that trust significantly predicts adoption ($B = 0.565$, $\beta = 0.610$, $t = 10.335$, $p < .001$). This indicates that for every one-unit increase in trust, digital wallet adoption increases by 0.565 units. The Variance Inflation Factor (VIF = 1.000) confirms the absence of multicollinearity.

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Table 4

Simple Linear Regression Analysis (Dependent Variable: Digital Wallet Adoption, N = 182)

Predictor	B	SE	β (Beta)	t	p	VIF
Constant	0.720	0.112	---	6.427	< .001	---
Trust	0.565	0.055	0.610	10.335	< .001	1.000

The model summary in Table 5 indicates that the overall regression model is significant ($F = 106.821$, $p < .001$). The R^2 value of 0.372 demonstrates that trust explains 37.2% of the variance in digital wallet adoption. The adjusted R^2 (0.369) confirms the model's goodness-of-fit after accounting for sample size. The Durbin-Watson statistic (1.927) is close to the ideal value of 2, indicating no autocorrelation in the residuals. Thus, H1 is strongly supported.

Table 5

Model Summary (N = 182)

R	R^2	Adjusted R^2	F	p	Durbin-Watson
0.610	0.372	0.369	106.821	< .001	1.927

5.4.2 Direct Effect of BDAC on Digital Wallet Adoption (H2) and Moderation Analysis (H3). To test the direct effect of BDAC (H2) and the moderating effect of BDAC on the trust-adoption relationship (H3), PROCESS Model 1 (Hayes, 2018) was employed with 5,000 bootstrap samples. The results are presented in Table 6.

Table 6

PROCESS Model 1 Moderation Analysis (Dependent Variable: Digital Wallet Adoption, N = 182)

Predictor	B	SE	t	p	95% CI
Constant	1.757	0.046	38.196	< .001	[1.666, 1.848]
Trust	0.324	0.068	4.718	< .001	[0.188, 0.459]
BDAC	0.320	0.057	5.622	< .001	[0.208, 0.433]
Trust × BDAC	0.066	0.051	1.301	.192	[-0.034, 0.166]

- **Direct Effect of BDAC (H2)**: The coefficient for BDAC is positive and statistically significant ($B = 0.320$, $SE = 0.057$, $t = 5.622$, $p < .001$). This confirms that BDAC has a strong positive direct impact on digital wallet adoption, independent of trust. Thus, H2 is supported.
- **Moderation Effect (H3)**: The interaction term (Trust × BDAC) yielded a positive but statistically non-significant coefficient ($B = 0.066$, $SE = 0.051$, $t = 1.301$, $p = .192$). Furthermore, the bootstrap 95% confidence interval for the interaction term includes zero ([-0.034, 0.166]), confirming that the moderation effect is not statistically significant at the conventional $\alpha = 0.05$ level. This indicates that while BDAC directly drives adoption, it does not significantly amplify the positive effect of trust on adoption. Thus, H3 is not supported.

The overall moderation model, as shown in Table 7, demonstrates a good fit ($R = 0.686$, $R^2 = 0.471$), with the combined predictors explaining 47.1% of the variance in adoption. The F-statistic ($F = 52.817$, $p < .001$) confirms the collective significance of the model.

Table 7

Model Summary for Moderation Analysis

R	R^2	F	df1	df2	p
0.686	0.471	52.817	3	178	< .001

5.5 Supplementary Analysis: Demographic Differences in Adoption

To examine whether digital wallet adoption varies significantly across different age cohorts, a **one-way ANOVA** was conducted. The results in Table 8 show that the between-group variance (SS = 1.485) is considerably smaller than the within-group variance (SS = 100.863). The F-ratio is 0.874 with a p-value of

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.456, which exceeds the 0.05 significance threshold. Therefore, we fail to reject the null hypothesis, indicating that digital wallet adoption does **not** differ significantly across age groups.

Table 8

One-Way ANOVA for Digital Wallet Adoption Across Age Groups (N = 182)

Source	SS	df	MS	F	p
Between Groups	1.485	3	0.495	0.874	.456
Within Groups	100.863	178	0.567		
Total	102.348	181			

To further explore pairwise comparisons, a Tukey HSD post-hoc test was performed. As detailed in Table 9, all pairwise comparisons between age groups yielded p-values well above .05, and all 95% confidence intervals contain zero. This confirms that adoption rates are consistent across all age cohorts, suggesting that age does not act as a barrier to digital wallet adoption in the sampled population.

Table 9

Tukey HSD Post Hoc Comparisons for Digital Wallet Adoption by Age Group (N = 182)

Comparison (I – J)	Mean Difference (I − J)	SE	p	95% CI
16–20 vs. 21–25	0.225	0.148	.425	[-0.158, 0.608]
16–20 vs. 26–30	0.169	0.175	.769	[-0.285, 0.623]
16–20 vs. 31–56	0.242	0.192	.586	[-0.255, 0.739]
21–25 vs. 26–30	-0.056	0.151	.982	[-0.446, 0.334]
21–25 vs. 31–56	0.017	0.169	1.000	[-0.422, 0.457]
26–30 vs. 31–56	0.073	0.180	.979	[-0.405, 0.551]

Table 10

Summary of Hypotheses Testing Results

Hypothesis	Statement	Result
H1	Customer trust has a positive and significant relationship with digital wallet adoption.	**Supported** (β = 0.610, p < .001)
H2	Big Data Analytics Capability (BDAC) has a positive and significant relationship with digital wallet adoption.	**Supported** (B = 0.320, p < .001)
H3	BDAC positively moderates the relationship between customer trust and digital wallet adoption.	**Not Supported** (Interaction: B = 0.066, p = .192)

As evidenced in Table 9, a Tukey post hoc test was done to further explore the pairwise difference in Digital Wallet Adoption by Age. As demonstrated, all results were non-significant at 0.05 level as all the p-values were above 0.05 level. For instance, the average disparity between the age group of 16 to 20 years and that of 21 to 25 years was .225 (p = .425), while, the average disparity between the age groups 16 to 20 years and 26 to 30 years was .169 (p = .769). Likewise, the differences between 16-20 years and 31-56 years (p=.586) as well as 21-25 years and 26-30 years (p=.982) and finally 21-25 years and 31-56 years (p=1.000) were not significant. Confidence intervals for every single one of the pairwise comparisons all contained 0, thus supporting the overall ANOVA finding that Digital Wallet Adoption is equal in every age group. Put simply, the respondents in the study are unaffected by age in using a digital wallet.

6. Discussion

This research focused on the impact customer trust has on the adoption of digital wallets and defined the moderation role of BDAC of Pakistan's digital financial services. Customer trust positively and significantly affected the digital wallet adoption, according to the research results. Users who think that a digital payment platform is safe, trustworthy, and offers maximum guarantees are more likely to adopt and use digital wallet. This finding is supported by previous research which indicates trust is one of the most essential predictors of acceptance and adoption technology (Davis, 1989; Venkatesh et al, 2003).

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The findings of the research established that BDAC has a positive direct effect on digital wallet adoption. Also, Companies that can perform complex analytics on consumer data and provide real-time solutions will improve customer experience through better fraud detection, cyber security, customized financial offers, and constant tracking of transactions. The customer confidence and continued use of digital financial services are likely to benefit from such technological capabilities. As a result, these findings show that organizational technology capability is an important driver of digital transformation and competitive advantage in the financial sector (Gupta & George, 2016; Mikalef et al., 2019).

Based on the moderation analysis, it was observed that both customer trust and BDAC were not statistically significant either ($\beta = .056$; $t = .81$; $p > 0.05$). This indicates that while both trust of customer and BDAC are hypothesized to have a positive effect on the adoption of digital wallets, BDAC does not significantly moderate the effect of trust on the adoption of digital wallets in the present study. As such, the findings indicate that consumer trust and organization analytics capability are independent components of digital wallet adoption. The moderation result which is not significant is contrary to previous studies which reveal that technological capabilities moderate the effect of trust strength on the adoption of technology. The current study finds that BDAC has an unimportant moderating effect because Pakistan's digital financial ecosystem is nascent, and users have little knowledge about technology, and protection from laws and regulations. Some users are good to go with technology.

In practical terms, the findings suggest that banks, Fin-Tech and Digital Payment Service Providers must, on a continuous basis, invest on data analytics infrastructure, artificial intelligence, predictive analytics and cyber security technologies for the enhancement and sustenance of quality of services and customers' trust. In the same vein, companies must continue to build and earn the confidence of customers with sound privacy policies and secure and safe modes of transaction, effective fraud prevention measures, and customer care. In addition to this, PG impact on all-inclusive monetary collaborations must be joining into advancement enunciates, regardless that digital financial systems assert and support senselessly digital financial integration across the Pakistan.

The literature on digital finance continues to grow. This paper adds to this literature by showing that customer trust and organizational technological capability heavily influence the adoption of digital wallets in the context of Pakistan. In theory and practice, the results will be useful for researchers, financial institutions, and policymakers, who wish to accelerate adoption of a digital payment system, and make progress towards sustainable growth of Pakistan's digital economy in the long run.

7. Practical Implications

7.1 Theoretical Contribution

Theoretical implications of this study provide noteworthy contributions to the literature on digital financial services adoption behaviours and beyond. To begin with, it expands the theoretical landscape of adopting technology. The Technology Acceptance Model (TAM) developed in 1989 by Fred D. Davis and the Unified Theory of Acceptance and Use of Technology (UTAUT) was introduced in 2003 by Viswanath Venkatesh et al. that proved customer trust is a key factor of e-wallet adoption especially in the case of Pakistan. The literature on acceptance and use of technology has stressed as a most important antecedent to use of technology, perceived usefulness, perceived ease of use, overall performance expectancy (Fred D. Davis, 1989; Viswanath Venkatesh et al., 2003). Research has shown that the perceived usefulness and ease of use of a digital wallet are key antecedents of its use 2020a; the contemporary studies on the electronic wallet adoption by way of customers show the important a part of Trust.

The findings entail many valuable research contributions. In our research, the first contribution stems from the Technology Adoption Model (TAM), where customer trust is included with technological factors (perceived usefulness, perceived ease of use, and perceived security). This combination helps close a knowledge gap and enhances TAM's explanatory power in the context of digital financial ecosystems. Customer trust is a better predictor of digital wallet adoption than technology. Moreover, trust is more important to customers than perceived security at higher order processing. This research helps us understand the factors that drive adoption of digital financial services. Another contribution of this study relates to the BDAC literature, as we simultaneously examine the direct effect of BDAC together with adoption impact of

trust on digital wallet adoption. BDAC has a strong positive direct impact on rate of adoption. Organizational technological capability is important for boosting of digital financial services which is strategic. In contrast, the proposed association between trust and digital wallet adoption did not find BDAC to have an essential moderating effect. In theory, trust and analytics capability functions which are two independents complementary. Even, not co-occurring drivers in Pakistan's digital financial ecosystem. Additionally, this research makes important theoretical contributions by updating.

7.2 Managerial and Policy Implications

- **For FinTech Operators and Commercial Banks:** Financial institutions should move past simple, generic mobile app designs. Capital investments should prioritize building robust data analytics infrastructure, refining automated fraud detection systems, and deploying artificial intelligence models to offer personalized user experiences.
- **For Economic Regulators (State Bank of Pakistan):** As analytics-driven financial platforms expand, regulatory frameworks must keep pace. Policymakers should update consumer data privacy guidelines, standardize financial fraud reporting, and create balanced regulatory sandboxes that protect user security while encouraging ongoing FinTech innovation.

8. Limitations & Future Research Directions

8.1 Limitations

- **Cross-Sectional Constraints:** The empirical analysis relies on survey data collected at a single point in time, which prevents us from mapping long-term variations in user behaviour.
- **Sampling Limitations:** Using non-probability purposive and convenience sampling can limit our ability to generalize findings across the entire population of digital wallet users in Pakistan.
- **Self-Reporting Focus:** Relying entirely on self-administered questionnaires can introduce minor response bias or socially desirable answers from participants.

8.2 Future Research Directions

- **Longitudinal Methodology:** Future research could employ longitudinal tracking designs to observe how consumer trust, privacy concerns, and wallet usage habits evolve over several years.
- **Mixed-Method Approaches:** Combining large-scale quantitative surveys with qualitative consumer focus groups would offer a deeper, more nuanced look at user behaviour and operational challenges.
- **Evaluating Next-Gen Technologies:** Future studies should look beyond basic analytics to examine how next-generation technologies—like blockchain architecture, decentralized biometric authentication, and Central Bank Digital Currencies (CBDCs)—shape consumer trust and adoption patterns.

9. Concluding Remarks

In conclusion, this study advances the understanding of digital wallet adoption in Pakistan by demonstrating that customer trust and Big Data Analytics Capability are both powerful and independent drivers of adoption, yet their interplay is not automatically synergistic. The findings underscore the importance of context-sensitive theorizing and practice in the digital finance domain. For developing economies like Pakistan, where digital financial inclusion remains a critical developmental objective, the path to widespread adoption requires a dual commitment: building consumer trust through transparent, reliable, and secure services, while simultaneously investing in technological capabilities that enhance operational excellence and user experience. However, firms must recognize that these two dimensions operate through distinct mechanisms and cannot be assumed to amplify each other automatically; deliberate efforts to bridge consumer awareness and backend sophistication are necessary.

As Pakistan's digital economy continues to expand, the insights from this study provide a foundational reference for researchers, practitioners, and policymakers seeking to accelerate the adoption of digital financial services. By attending to both the psychological foundations of trust and the technological enablers of analytics capability, stakeholders can collectively contribute to a more resilient, inclusive, and technologically advanced financial ecosystem—one that not only drives economic growth but also empowers millions of unbanked and underbanked citizens to participate meaningfully in the formal economy.

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Contribution of Authors

All the authors participated in the ideation, development, and final approval of the manuscript, making significant contributions to the work reported.

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The authors declare no conflicts of interest.

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Informed Consent

Informed consent was obtained from all individual participants included in the study.

Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of 1964 Helsinki declaration and its later amendments.

Data Availability

The datasets generated during and analysed during the current study are available from the corresponding author on reasonable request.

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