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Factors Influencing SMEs' Adoption of Mobile Payments: The Mediating Role of Trust in Technology

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The purpose of this study is to understand the factors contributing to the adoption of mobile payment systems among the users in Pakistan. The factors that influence the technology and the relationship between Perceived Usefulness (PU), Perceived Ease of Use (PEU), Cost of Adoption (CA), and Security & Privacy Concerns (SPC) and Trust in Technology (TIT). The growing importance of the digital financial solutions in emerging economies necessitates the study of trust development in technology to better promote its use among users. Data were collected from 220 respondents in mobile payment systems like Easypaisa, JazzCash, and Nayapay in Pakistan were gathered with the help of a structured questionnaire in urban areas. Purposive sampling technique was employed to make sure that relevant participants will be involved. Partial Least Squares Structural Equation Modeling (PLS-SEM) conducted through SmartPLS was used to analyze the data. The findings show PU and PEU have positive and significant impacts on TIT, whereas CA and SPC have negative and significant effects. The result also shows a strong mediation between these independent variables and AI by TIT, and it proves its primary role in the decision making of users. These results indicate that trust is a pivotal channel through which perceptions concerning the usability of the system, its affordability, and security have been worked down to the intention of the active adoption. The findings provide useful information to the fintech companies, the providers of mobile payments, and policymakers as well. By helping to make mobile payment platforms more convenient, valuable, and inexpensive, and having in place strong security and privacy measures, one can greatly increase the trust of the user and consequently their adoption. Awareness of these advantages and preemptive apportioning of the apprehensions of the users can also help in further enhancing the levels of adoption, particularly in a digitally developing economy such as Pakistan.

1. Introduction

The widespread use of mobile technology has redefined the financial environment all over the world, and mobile payment systems have become one of the key innovations that enable people to perform financial operations in a convenient, efficient, and secure way (Wilson et al., 2021). Pakistan is a very promising country that could foster mobile payments due to its expanding mobile penetration rate and budding digital economy, which could enrich financial inclusion, boost commerce, and drive financial growth (Xu et al., 2024; Abrahão et al., 2016). By 2025, there are over 190 million mobile subscribers and smartphone permeability has grown to about 51 percent of the population due to cheap smartphones and increased internet access. Even though such an environment is rather favorable, mobile payment systems usage is rather uneven, which is preconditioned by a multiplex of technological, psychological, and socio-economic reasons (Siagian et al., 2022). These are some of the factors to consider creating more acceptance and usage of mobile payment platforms in Pakistan. Technology Acceptance Model (TAM) developed by Davis (1989) provides a strong starting point as far as studying the adoption of technology is concerned because it has used Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) as important determinants of user acceptance. PEU denotes the extent to which people perceive that their efficiency and effectiveness of conducting transactions is improved by using a mobile payment system, whereas PEOU will represent how easy people find using such a payment system that mobile (Chin et al., 2022; Moghavvemi et al., 2021).

In the case of Pakistan, with a wide disparity between urban and rural populations in terms of digital literacy, it is important to note that these perceptions have caused citizens to develop mistrust toward mobile payment technologies (Cao et al., 2021; Chhonkera et al., 2017). Also an important factor is Cost of Adoption (CA), which includes an economic factor, financial, time and effort pressures and this is important because in Pakistan a price sensitive market environment is a cough state and the monetary component of a technology decision is dictated by financial constraints. The Security and Privacy concerns (SPC) are the key drivers that influence user trust, especially in a developing economy whereby breached data, fraud, and cyber dangers are primary concerns. Security concerns of potential users preventing abuse of personal and financial information can prevent the use of mobile payment systems (Merhi et al., 2019). The belief in the reliability, safety, and competence of a system (Trust in technology) serves as a crucial intermediary between all the above antecedents (PU, PEOU, CA and SPC) and Adoption Intention (AI) which indicates the willingness of an individual to adopt mobile payment solutions (Dennehy & Sammon 2015). In Pakistan where trust and reliability are the cultural and social norms, it is indispensable to examine how trust mediates the association between such factors and adoption intention by stakeholders, including policymakers, financial institutions, and mobile payment service providers (Prastiawan et al., 2021). This study examines how all of the above factors (PU, PEOU, CA, and SPC) influence the element of trust towards mobile payment technologies in Pakistan, and eventually the adoption intention.

This study employed a quantitative research method based on TAM framework to develop an in-depth study on the factors that have influenced or prevented the use of mobile payments. The insights will be considered valuable to assist stakeholders to develop user-focused mobile payments systems, overcome security challenges, and facilitate digital financial inclusion into the Pakistani fast expanding digital environment. The research also adds value to the scholarly discussions because it advances the TAM model into a developing country scenario and points out the mediating impact of trust in technology adoption. Technology Acceptance Model and Adoption of Mobile Payment in Pakistan Technology Acceptance Model (TAM) is a strong theoretical basis that can be applied to understand user behavior concerning the adoption of new technologies and especially in developing economies such as Pakistan (Khalek et al., 2024). The TAM has two constructs which are central in predicting technology acceptance by a user; they include Perceived Usefulness (PU) and Perceived Ease of use (PEOU) (Siagian et al., 2022). The factors are crucial in shaping the perceptions and intentions of entrepreneurs premised on the mobile payment adoption context among SMEs in Pakistan. The more the SMEs find the mobile payment systems beneficial in enhancing business efficiency and the lack of complex procedure to use, the higher the level of trust towards the technology (Shao et al., 2019). Besides the original constructs of TAM there are two constructs that are more important to the SME sector in Pakistan Cost of Adoption and Security & Privacy Concerns.

Small businesses are highly sensitive to the cost of their operations thus affordability becomes a significant factor in determining their level of trust. Similarly, such fears as security breaches, fraud, and technical weakness can deter adoption unless addressed in a satisfactory manner. The more SMEs feel that the mobile payment platform is secure, affordable, and easy to use, the more they will develop confidence in the technology. It is essentially a middle ground between these antecedents and Adoption Intention (Xu et al., 2024). Considering the Pakistani environment, where infrastructure and digital literacy are in the early stages of development, trust formation becomes essential to enhance adoption. As a result, the role played by PU, PEOU, cost, and security in the formation of trust has important implications on the mobile payment service providers and policymakers in the sector that want to increase digital financial inclusion of SMEs.

Security and Privacy Concerns are imperative to the development of Trust in Technology in the context of mobile payment adoption by SMEs in Pakistan, basing on Trust/Risk Theory (Wilson et al., 2021; Luo et al., 2010). The SME in Pakistan is characterized by low-trust and digital infrastructure problems, and therefore, Pakistani SMEs are more reluctant to implement financial technologies when it is not guaranteed that the system would be secure and the privacy of information preserved. attitudes concerning databases hacking, unauthorized access, and fraudulent transaction may directly affect the degree to which business owners trust mobile payment systems. With it, other variables, like Perceived Usefulness, Perceived Ease of Use, and Cost of Adoption are also major influencers of Trust in Technology (Moghavvemi et al., 2021). By SMEs finding the mobile payment systems to be helpful in enhancing their business operations,

simple to use without technical knowhow and cheap to effect, the confidence made in the systems helps to reinforce their trust in such systems. Trust, in its turn, is one of the mediating variables having a positive impact on the Adoption Intention of mobile payments. In the economy of Pakistan, therefore, to promote trust, it is crucial to build mobile payment platforms that are safe, convenient, and low-cost to empower the SMEs to adapt and accept the payment system by adopting and making it part of the regular business activities.

2. Literature Review

2.1 Technology Acceptance Model (TAM

Technology Acceptance Model (TAM) is the theory formulated by Davis (1989) and it is one of the essential concepts in the behavior of human in adopting and utilizing technology. According to the model, two aspects, namely Perceived Usefulness (PU) and Perceived Ease of Use (PEOU), are expected to play a significant role in determining whether a user will have a positive attitude to using a system, which also determines his or her intention to adopt it. TAM is an important theory that can be applied to investigate the behavioral intents of users when adopting digital financial services in the Pakistani context of mobile payment adoption.

Perceived Usefulness in this study is the degree to which the users think that mobile payment systems are going to make their financial transactions more efficient and convenient. With the trend that commerce in Pakistan has been becoming ever more digital, especially among small companies and the urban communities, the system that will be considered beneficial due to its apparent utility in saving time and making transactions more effective will become more easily adopted. Perceived Ease of Use, in its turn, is the way that users see the mobile payments platforms as easy to learn and to understand how to use them successfully. Ease of use is a critical acceptance factor given the different degrees of digital literacy that exist when comparing different segments of the population.

Although TAM is normally concerned with PU and PEOU, this research is integrating Trust in Technology as an intervening variable- a more applicable measure that will however make TAM more pertinent in accordance to the practices of mobile financial services in developing nations. When human contact is absent in a digital environment, it is essential to rely on the reliability, safety, and privacy of the platform on which the digital environment is based which becomes the basis of adoption. As such, users' perceptions to security and privacy will be paramount since they will have a direct connection in the extent to which the used technology will have a trust. Moreover, Cost of Adoption which was not included in the initial TAM can be identified as an important contextual variable in Pakistan since affordability and accessibility can be seen as two of the key barriers to technology diffusion. This study incorporates TAM and trust related constructs in an attempt to capture the broader meaning of mobile payment use behavior. It indicates that users do not just have to believe that the system is effective and user friendly but

also reliable and cost effective, especially in such market place as Pakistan where the issues of cyber security and cost of technologies is quite high on the agenda.

2.2 Trust Theory

The Trust Theory is a crucial source of psychological context regarding the behavior of users in the digital realm, particularly when there exists uncertainty and perceived susceptibility. On the mobile payment adoption in Pakistan, trust in technology is crucial in the definition of user intentions. In this case, trust means the attitude held by a user that the mobile payment system is reliable, secure, competent and will not fail to do what it ought to do even when there is no available complete information or control (Mayer et al., 1995; McKnight et al., 2002).

These assumptions of the Trust Theory correlate, more or less, with some specific signals individuals build a trust judgment around--namely, the quality of the system, its openness, perceived integrity and competence of the technology provider. PU and PEOU are also enabled, in this study, as elements of trust. When the mobile payment systems are convenient in terms of offering aids in financial transactions besides being simple to use, the trust that develops against the technology will be greater. Equally, Cost of Adoption has an influence on trust; it impacts the sense of fairness or value. The prohibitive pricing can cause mistrust towards the intentions of the provider or whether he or she is committed to the availability of the solution and therefore reduce trust. Most importantly there is the issue of Security and Privacy Concerns that are directly related to trust when applying mobile payments. In a developing economy such as Pakistan, whereby there is always a fear information leakage, fraud and poor regulation, the capacity of a platform to deliver its promise on confidentiality and protection of vital data highly influences trust among its users. Failure to deal with these issues can render a system with a perceived usefulness and perceived ease of use but which is still not likely to find good momentum among prospective users.

2.3 Hypothesis Development

2.4 Perceived usefulness and Trust in Technology

The Perceived usefulness (PU) is one main factor that influences the trust that users may have towards a certain technology (in the case of digital platforms such as mobile payment systems). Users face the likelihood of establishing confidence in a given system when they think that the particular technology improves their performance or has a high level of utility (Damodharan et al., 2024). This is in the view that usefulness eliminates uncertainty; a technology which is perceived to be useful will strengthen in building the belief that it can be relied on and cater to the needs of the users (Wilson et al., 2021; Luo et al., 2010). In mobile payment systems, to provide an example, when users understand that the system is useful to make a quick, secure, and convenient transaction, their trust towards the technology will grow, thereby facilitating trust (Al-Fahim et al., 2024). Also, trust is a factor and does not completely depend on perceived usefulness but is a mediator in introducing the eventual adoption of the technology (Bustaman et

al., 2023). Therefore it is important to invest in increasing the perceived usefulness of mobile payment applications by having functional features, user specifications and stability to increase the level of trust among the users, especially in the scenario where adoption of digital tools is still in its early stage like in the developing nations.

H1: Perceived usefulness has a positive impact on Trust in Technology

2.5 Perceived ease of use and Trust in Technology

Perceived ease of use (PEOU) exists as a major source of trust building in technology, especially in the usage of digital and mobile payment system. The ease of comprehension and use leads to higher confidence levels and less apprehension on the part of the user and this creates trust when used with a technology (Siagian et al., 2022). The rationale is simple enough: a system that minimizes the cognitive load and technical complexity lowers the barriers to entry and the probabilities of positive user experience hence building trust (Davis, 1989). Ease of use is also associated with browning out fears in mobile payment settings when users are initially uncertain or skeptical about the digital security of payment systems as well as the reliability of the systems (Saoula et al., 2023). Moreover, PEOU, which indirectly builds trust by affecting PU- the more user- friendly a system is, the more likely a user is to perceive the system as useful, and the stronger his or her trust in the technology can be (Prastiawan et al., 2021). Therefore, when designing the digital interface of mobile payments in a nation like Pakistan, where digital literacy can be low in the SME sector, it is crucial to make the interface easy to navigate and trust-building to encourage uptake.

H2: Perceived ease of use has a positive impact on Trust in Technology

2.6 Cost of Adoption and Trust in Technology

The cost of adoption is a crucial factor that determines the degree of confidence of users towards a technology, especially where economic constraints contribute to influencing technology related decisions as is the case with small and medium-sized enterprises (SMEs) operating in developing economies like Pakistan. When it is highly priced in monetary terms or time consumed or effort required in implementing a new technology, perceived cost may discourage the user and might not trust the technology as much or even believe in the usefulness of the technology (Nirmawan & Astiwardhani 2021). Perceived risks may be presented by sheer upfront investment, the complexity in terms of integration processes or occasional ongoing operational costs, to the extent that perceived risks outweigh perceived benefits (Xu et al., 2024). Conversely, when users feel the price of adoption is fair relative to the value and productivity that is provided, it can generate optimism and establish credence in the technology (Moghavvemi et al., 2021). Trust arises when users have a feeling that the provider of a technology is giving a fair exchange and is not economically taking advantage of him (Kim et al., 2009). Thus, it will be important to lower

the perceived costs or ensure that the utility of the mobile payment systems is crystal clear in order to build trust, at least among the SMEs, which are more sensitive to the costs.

H3: Cost of Adoption has a negative impact on Trust in Technology

2.7 Security and Privacy Concerns and Trust in Technology

The issue of security and privacy is important in evaluating trust in technology especially with mobile payment systems since these are in the digital form. The users readiness to adopt technology will greatly depend on their opinion on the degree to which their personal and financial data is secured (Bailey et al., 2022). Users are more likely to confide in the technology when they think there are appropriate safeguards to avoid unauthorized access, breach and misuse of their information (Chin et al., 2022). On the same note, misperceptions or mishandling of data breaches in the past can easily interfere with the trust to the net effect of resistance or reluctance in the adoption stage (Khalek et al., 2024). In less developed nations, such as Pakistan, where legislation is less mature and the level of digital literacy not uniform, issues of data security, and privacy are of particular concern (Islam et al., 2024). Transparency in data processing, encrypting data, and properly informing the user about privacy rights is, therefore, a critical way of building the confidence of people to use mobile payment systems. To trust technology, consequently, is to render susceptibilities negligible and to enable consumers to feel safe in their usage of online systems.

H4: Security and Privacy Concerns has a negative impact on Trust in Technology

2.8 Trust in Technology and Adoption Intention

The perception of trust towards technology is a key factor that dictates technology adoption intentions of the users to implement new and innovative digital systems including mobile payment systems. Trust is a psychological guarantee that minimizes doubt and perceived risk especially in situations where it is the users who need to depend on technology even though they do not comprehend its internal operations (Xu et al., 2024). The value of usability is that when users believe a technology is reliable, secure and doing what they thought it would do, then they are also more likely to develop a positive attitude towards use (Cham et al., 2022). This connection is particularly timely in settings like Pakistan, where the distrust of digital platforms in places which are connected to issues of data breach, fraud, and system failure can be high. Such environments utilize trust as an intermediate state between the perceptions of users (e.g., utility, ease of usage, security) and the intention to behave (Ansori & Nugroho, 2024). In addition, empirical studies have time and again yielded that trust is an important indicator of the willingness of users to use new technologies (many a time overshadowing even functionality related issues), especially in situations that involve financial transactions (Tan et al., 2025). Hence, due to the fact that factors such as ease of using technology and trust in technology have become significant, creating and

sustaining trust in technologies is important in promoting the use of mobile payment systems by both individuals and small and medium enterprises.

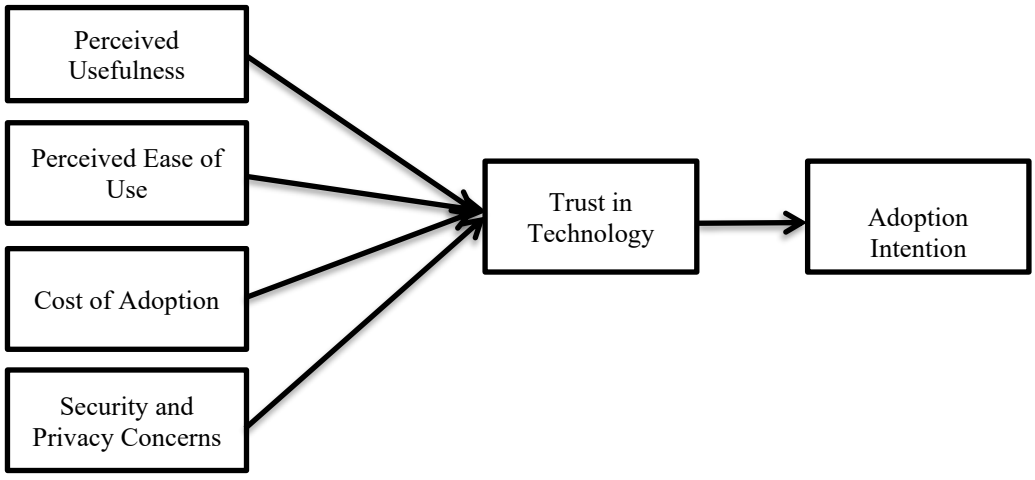
H5: Trust in Technology has a positive impact on Adoption Intention

2.9 The Mediating Role of Trust in Technology

Technological trust is a key mediating factor in the relationship between the perception of a user and the intention to utilize digital platforms or, more specifically, mobile-based payment systems (Dawood et al., 2022). Although perceived usefulness, perceived ease of use, costs required adopting, and security and privacy are known entities that influence the attitude of users towards technology, the interplay between them is frequently linked to trust (Tan et al., 2025). As an example, the users of a system that is useful and that is simple to use would not only feel that the system is more efficient but also that the system is reliable and will run smoothly, thus gaining more trust (Namahoot & Jantasri, 2023). Likewise, the adoption cost should be seen to be affordable and the data security schemes should be perceived to be effective to have the users trust the technology (Alrawad et al., 2023). Trust, on its part, is a psychological facilitator, and it lessens uncertainty as well as perceived risk and it has positive effects on the user, in terms of probably using the technology (Nirmawan & Astiwardhani, 2021). Insufficient trust can ensure that even quite helpful or affordable technologies cannot become popular, especially when located in a country, such as Pakistan, where some distrust of digital systems may exist due to previous history or the absence of regulatory enforcement. Thus, along with the enhancement of the immediate effects of these antecedents, trust in technology fills the gap between user perception and behavioral intention and can be discussed as the essential independent mechanism in the process of technology acceptance.

H5: Trust in Technology mediates the relationship between (a) Perceived Usefulness, (b) Perceived Ease of Use, (c) Cost of Adoption, (d) Security and Privacy Concerns and adoption intention.

Figure No 1: Conceptual Framework



3. Methodology

The research design used to conduct the study was quantitative and aims at finding explanations to the research questions within the study namely, How will the Perceived Usefulness, Perceived Ease of Use, Cost of Adoption, and Security & Privacy Concerns influence the Trust in Technology and how will this trust in technology optimistically affect the Adoption Intention of mobile payment systems in Pakistan. The major tool of data collection was a structured survey questionnaire. The target sample included the individuals in the urban regions of Pakistan who are current users or have the potential to be a user of mobile payment systems including Easypaisa, JazzCash, and Nayapay. A purposive sampling technique will be used because only the respondents who had any form of exposure to the systems of mobile payment will be used. The data comprised 220 valid answers that represent the minimum number of questions recommended in Partial Least Squares Structural Equation Modeling (PLS-SEM) according to Hair et al. (2014). The items of the questionnaires were taken upon well-established studies and the scale was a 5 point Likert scale where strongly against (1) and strongly agree (5). According to the results of the statistical analysis via SmartPLS 4.0, which is applicable in exploratory studies and models accounting the presence of mediating variables and when the population is not normal and completely known, it has been observed that there is significant relationship between the four variables that were identified in this study. It will give empirical evidence as to the nature of adoption behaviors that mobile payment users in Pakistan should follow because of the robust testing of the hypothesized relationships.

4. Results and Discussion

4.1 Respondents' Profile

Table No 1: Demographic Profile of the Respondents

Criteria	Frequency	Percentage
Gender		
Male	157	71.36
Female	63	28.63
Age		
20 to 30 years	130	59.09%
31 to 40 years	55	25.00%
41 to 50 years	35	15.90%
Monthly Income		
25,000 to 50,000	35	15.90
50,00 to 75,000	60	27.27
75,001 to 100,000	75	34.09
100,000 and above	50	22.72

Table No 2: Measurement model

Construct	Items	loading	Cronbach's alpha	CR	AVE
Perceived Usefulness	PU 1	0.714	0.712	0.771	0.734
	PU 2	0.757			
	PU 3	0.817			
	PU 4	0.782			
Perceived Ease of Use	PEU 1	0.821	0.804	0.785	0.710
	PEU 2	0.790			
	PEU 3	0.771			
	PEU 4	0.780			
Cost of Adoption	CA 1	0.825	0.843	0.807	0.740
	CA 2	0.861			
	CA3	0.81			
Security & Privacy Concerns	SPC1	0.870	0.761	0.752	0.701
	SPC 2	0.851			
	SPC 3	0.817			
	SPC 4	0.821			
Trust in Technology	TIT 1	0.790	0.821	0.792	0.741
	TIT 2	0.846			
	TIT 3	0.775			
	TIT 4	0.824			
	TIT 5	0.751			
Adoption Intention	AI 1	0.833	0.784	0.795	0.764
	AI 2	0.798			
	AI 3	0.769			
	AI 4	0.820			
	AI 5	0.792			

The demographics are shown in table no 1. The demographic data of the respondents shows a captivating population but reasonably distributed desegregation with regard to gender, age, and income groups. The sample is dominated by males as 71.36 percent (157 respondents) of the total people are males compared to 28.63 percent (63 respondents) who are females. Age wise, most respondents (59.09%) who participated in this survey were between 20 and 30 years in age with 25% being between 31 and 40 years and 15.90% respondents were between the age of 41 and 50 years, and this indicates youthful group actively experimenting with mobile payment technologies. When it comes to monthly salary, 34.09 percent of the respondents earned between 75,001 to 100,000 PKR and 27.27 percent earned between 50,000 to 75,000 PKR and 22.72 percent earned

above 100,000 PKR. In a smaller percentage, (15.90 percent), the income of the participants was between 25,000 to 50,000 PKR. These levels of income distribution show that the sample is mostly people in the middle to upper-income brackets, more inclined to have access to mobile payments technologies and the digital literacy needed to operate them to the maximum.

Table No 3: Discriminant validity Heterotrait–Monotrait (HTMT).

Variables	1	2	3	4	5
PU					
PEU	0.412				
CA	0.521	0.689			
CPC	0.438	0.643	0.777		
TIT	0.597	0.701	0.755	0.693	
AI	0.398	0.682	0.723	0.745	0.768

The HTMT method denotes values lower than 0.85 to indicate good discriminant validity (the constructs are different from one another). HTMT (HeterotraitMonotrait Ratio) confirm that the discriminant validity exists between the constructs used in the research. The main purpose of discriminant validity is to determine that each of the constructs in the model is conceptually not overlapping with others. In this table, the sum of all the HTMTs is lower than the conservative of 0.85 which means that the constructs are empirically different. Indicatively, the HTMT ratio between Perceived Usefulness (PU) and Perceived Ease of Use (PEU) is 0.412 and between PU and Trust in Technology (TIT) is 0.597 representing moderate yet satisfactory correlations of the relationship. The largest correlation is found between Cost of Adoption (CA) and Security & Privacy Concerns (SPC) with 0.777 and this is somehow natural as both of them fall into the same conceptual area, yet the value is still within an acceptable limit. As well, Trust in Technology is closely related to Adoption Intention (AI), the HTMT value is 0.768, as per the assumption given in the model, the trust is the core element that impacts the adoption behavior. All in all, the findings show that the constructs are both valid and dependable and also justifiably different which indicates the strength of the framework suggested with regards to mobile payment adoption in Pakistan.

Table No 4 provides the results of hypotheses. The results of the hypothesis testing shows that the relationships that have been proposed are all statistically significant. The effect of Perceived Usefulness (PU) on Trust in Technology (TIT) is significant and positive with an original sample value of 0.312 ($p < 0.001$), so the higher the perception of usefulness of the mobile payments, the higher the trust. In the same way, the ease of use is also profoundly positively affected (PEU, beta = 0.284, $p < 0.001$), indicating that the systems that can be used with ease have a better chance of being trusted. Conversely, Cost of Adoption (CA) has a negative impact on trust (-0.217) ($p =$

0.003), and therefore, the higher the perceived costs the lesser the trust that users demonstrate towards the mobile payment systems.

Table No 4: Summary of Hypothesis Test and Results

Variable	Original sample	Sample mean	T statistics	P values
PU -> TIT	0.312	0.298	4.217	0.000
PEU -> TIT	0.284	0.276	3.891	0.000
CA -> TIT	-0.217	-0.225	2.973	0.003
SPC -> TIT	-0.338	-0.321	5.186	0.000

Finally, the critical importance of secure, private environments in fostering user confidence is again supported by finding that Security and Privacy Concerns (SPC) have a very strong and significant negative relation with trust (b = -0.338, p <0.001). The findings affirm the theoretical framework and give us practical implications about enhancing mobile payment use in terms of usability, affordability as well as assuring people of security.

Table No 5: Mediating Hypotheses

Variable	Original sample	Sample mean	T statistics	P values
PU -> TIT -> AI	0.196	0.191	3.521	0.000
PEU -> TIT -> AI	0.158	0.149	2.784	0.005
CA -> TTI -> AI	-0.123	-0.119	2.511	0.012
SPC -> TIT -> AI	-0.137	-0.131	3.408	0.001

The new findings of the mediating hypotheses justify that Trust in Technology (TIT) plays a significant mediating role between the Independent variables and Adoption Intention (AI). The indirect route of Perceived Usefulness (PU) to AI via TIT yields a significant contributor (0.196, p < 0.001) implying that in case mobile payment systems are useful, the satisfaction level of users can be reinforced, and when they have a higher trust level they are more inclined to use them. The same goes with Perceived Ease of Use (PEU) because it has a very robust indirect effect (0.158, p=0.005) and this is implying that ease of use reinforces trust, which eventually invokes adoption. Interestingly, there is the negative and significant marginal direct impact of Cost of Adoption (CA) (between -0.123 and 0.097, p = 0.012), which shows how it decreased trust and, thus, decreased adoption intention. Finally, the presence of Security and Privacy Concerns (SPC) was also found to have a negative effect on adoptions and was associated with lower trust (beta = -0.137, p = 0.001), indicating that the concerns users prioritize their safety and privacy are among the factors

that directly impacted the ability to build trust and thus use a new technology. The findings confirm the mediating variable of trust and how critical trust is in transforming perceptions conceptualized by users into adoption behavior when it comes to system mobile payments in Pakistan.

4.2 Discussion

The results of the present research add significant knowledge to the issue of behavioral intention of mobile payment users in Pakistan and allow noting the leading position of technology trust as a mediator between the perception of users and the intention to adopt it. The findings indicate that Perceived Usefulness (PU) is a strong predictor of Trust in Technology and thus as more users of the mobile payment systems consider the system helpful in enhancing the ease of transaction and efficiency of the transaction process, the more they trust the mobile payment systems. It is also consistent with the Technology Acceptance Model (Davis, 1989), which views the perceived usefulness as one of the relevant sources to drive the technology adoption and concurs with similar existing studies (e.g., Venkatesh & Davis, 2000; Luo et al., 2010) that reduced PU remains a determinant in fostering trust in digital universal banking services. Similarly, Perceived Ease of Use (PEOU) was recorded to affect the trust positively and significantly. Ease of use will decrease cognitive load and give confidence to the users in a technology because even in the context of Pakistan digital literacy level is disparate. Providing a user-friendly and intuitive interface to mobile payment systems makes the systems more likely to be trusted by the user and these further increases the chances of adoption. This observation reinforces the picture that usability and systems simplicity are major facilitators of the trust in technologically based services (McKnight et al., 2002).

Regarding the Cost of Adoption (CA), the research study established that there is a negative and significant relationship between the trust and Cost of Adoption (CA). It means that increasing the figure of cost in the form of transaction fees, data charges, or affordability of the device can minimize the trust level of users regarding the technology. Cost perception can be equated to injustice or even exploitation in a developing nation such as Pakistan where a large number of people have a cost conscious mind-set, and thus can lack trust in the system. This observation underlines the requirement that mobile payment service providers develop their services to be affordable and driven by reasons to make them trusted and promote wider use.

Further, the second aspect which significantly influenced trust in a negative manner was Security and Privacy Concerns (SPC) which validated the fact that view of risk is a very powerful deterrence in using technology in a transaction. Unless there is a certain level of confidence on the part of users of mobile payment platforms that no one can access their accounts or steal their identities, or misuse their information, users will not be confident to use the systems, no matter how easy they are or how useful they are. This is in line with the argument of the Trust theory (Mayer et al., 1995) which states that the trust would decline in situations where there is a high risk that is guarded by institutional protection. These findings have demonstrated the necessity of

service providers and regulators to have in place powerful security measures, data security policies and clear privacy policies to allay fear in the minds of the users.

Lastly, Trust in Technology was significant and the causal factor of Adoption Intention in the proposed model, so its mediation effect was established. Although a mobile payment system may be either useful or low-cost to users, the fact is that even when they perceive value in using it, such an application will fail to gain traction unless people trust it to be reliable and secure. This result supports the earlier studies (e.g., Gefen et al., 2003; Pavlou, 2003) where trust is regarded as a foundation of e-service adoption, especially high risks and low institutional trust situation.

In conclusion this study adds value to the literature by combining concepts of TAM and Trust Theory to provide an inclusive paradigm that can be used in explaining the mobile payment adoption in Pakistan. The concept developed in the findings is that technological functionality should be balanced with affordability and perceived security in order to develop trust which is a precondition to adoption. Practical implications can be adapted to the both service providers and policymakers whose goal is to expand financial inclusion using digital payment platforms in emerging markets based on the results.

5. Conclusion

This study presented the implementation mobile payment systems technology in Pakistan that investigated the effect of four important antecedents, i.e., Perceived Usefulness, Perceived Ease of Use, Cost of Adoption and Security/Privacy Concerns on Trust in Technology, and the following effect of trust on Adoption Intention. The results are more than compelling to indicate that perceived factors influence majorly the level of trust among users on mobile technologies when it comes to paying their bills which is of utmost significance in mediating the behavioral intention of a user to apply such systems.

Particularly, Perceived Usefulness preponderated as a good predictor of trust whereby the intended mobile payment platform designings should address the idea of ensuring that the platforms provide definite practical values to those using the platforms. Similarly, Perceived Ease of Use was found to mediate trust because it minimizes the complexity and the intellectual input involved in adopting technology. Further, Cost of Adoption which is an issue of critical concern in a developing economy such as Pakistan showed significant negative correlation with trust which indicates that people cannot adopt mobile payments due to costs unless costs are not managed. Last but not least, Security and Privacy Concerns played an important role in influencing trust and confirmed the longstanding concerns about data breaches, fraud, and misuse regarding personal data that is a deterrence to users utilizing digital platforms.

The study affirms that Trust in Technology is a pivotal psychological process that carries over these perceptions into the intention to adopt the mobile payment services. In a country like Pakistan, where online financial platforms have not yet penetrated deeply and the consumer still

has many doubts, trust and its building becomes not just a positive probe, but a crucial requirement. Businesses, developers, and organizations in charge of policy need to take the user-centric design seriously, make everything as transparent as it can be, and make sure every security measure is as tight as possible to develop trust and by extension boost adoption.

In conclusion, the study yields a good theoretical and practical understanding of how mobile payment is taken up in an emerging economy. This reaffirms the positioning of trust as a facilitative intermediary exposure between user perception and adoption attitude, implying that any activity to build communicable usefulness, usability, actual affordability, and security will reinforce trust and consequently increase utilization of mobile payment system among the heterogeneity of users in Pakistan.

5.1 Implications

This study adds on to the broader technology acceptance literature by building trust in technology as a mediating construct between the key perceptions of users, perceived usefulness, perceived ease of use, cost of adoption and security and privacy concern and the adoption intention. Although other models like Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) have concentrated mainly on direct connections between perceptions and intention of behavior, this study brings a relatively better explanation into the world of adoption since it identifies the importance of trust as a crucial psychological facilitator of adoption in the context of technology-based environment.

Its contribution to the theory is in validating this hypothesis that trust is not a mere consequence of the perception about the system characteristics but a means of converting these perceptions into adoption behavior traditionally low levels of trust toward the systems, like digital platforms, in developing countries (including Pakistan). In addition, the representation of the cost of adoption and security and privacy aspect components of the model implies a theoretical gap in the presence of the literature focusing on mobile payment adoption studies in South Asian settings where such factors tend to manifest themselves in even greater degrees than in the advanced world. Accordingly, the study presents a theoretically sound framework, which is rich in contexts and can be used in future studies to examine technology adoption in the same socio-economic environment.

In practical terms, the study will be useful in suggesting actionable results to service providers of mobile payment services, financial bodies as well as policymakers in Pakistan. First is to ensure perceived usefulness, service providers should aim at proving the services in clear and easy visible forms like the convenience, speed and ease in the transaction and integration to other financial services. Resistance to adopt can be minimized by increasing perceived ease of use which is facilitated by intuitive design, multilingual interfaces, and user education programs that will help people be less afraid of the new technology particularly to lower-tech-savvy populations.

The adoption cost issue is essential to focus on- lower transaction cost, incentives to new users, free installation and setup services have the potential to influence the level of trust among the users. What is more important is that the issue of security and privacy has to be taken seriously. The users may be alleviated by the idea that their personal and financial data are secure with transparent data management policies, multi-factor verification, and periodic systems audits.

Finally, development and preservation of trust in technology must become a strategy priority. This can be provided by raising awareness in the population, endorsements of well-known institutions, and round-the-clock customer service. By facilitating trust-building, other than enhancing the current adoption, the practice would promote the long-term use of the mobile payment systems and sanction its sustainability in Pakistan.

5.2 Limitations and Future Research

Although this study provides useful information to understand the factors that can drive the take-up of mobile payment systems in Pakistan, it also has few limitations. It is crucial to acknowledge these limitations in order to put the findings and subsequent work on mobile payment adoption dynamics into context, and this will also inform future studies in place to develop the current understanding. The study employed a cross-sectional survey methodology with only the perceptions of the users being measured at one specific time. This reduces the capacity to examine changes in the trust in technology and adoption-intention preferences with respect to time (more especially when the users become experienced in terms of using the mobile payment sites). The sample used in the study might not be representative of the whole population of Pakistan. The majority of the respondents belonged to urban areas or semi-urban lifestyle with relatively higher exposure to the concept of digital technology. This restricts the generalization of the research to the entire nation. The studies are based on self-reporting data, which is prone to bias due to social desirability or inaccuracy in self-perception of the subjects. The idea that respondents have overestimated intention to adopt mobile payment or misreport security or cost concerns may be the case. Though the study has covered technological and economic predictors of trust, it failed to capture cultural, religious, and social factors that matter more in consumer behavior in Pakistan. The research ignored type of mobile payment platform (e.g. mobile wallet, bank apps, telecom-based payment systems). The platforms might be dissimilar in perceived ease of use, price, and levels of security that might profoundly impact trust and adoption intention.

Future researches should use a longitudinal research method to observe the change in the level of trust, usage behaviour and intention to use over time. This would be used to understand how the first impressions change as time goes by and whether the confidence in the technology improves or hinders hence the long-term use of the technology. To further understand the adoption of mobile payments in Pakistan, it would be observed to include those in rural areas and underrepresented groups. Adjusting the mobile payment solutions to the specific needs of these segments may be a breakthrough in the area of financial inclusions In future research, they are

supposed to focus on incorporating cultural, societal and religious aspects into the research model. Like subjective norms, family influence, institutional trust, and the like may lend more light into motives and barring factors to mobile payment adoption in culturally diversified nations, such as those of Pakistan. A comparative study may be undertaken in analyzing the disparities in adoption behavior across different mobile payment environments in Pakistan.

6. References

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