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Factors affecting the adoption of Fin-tech in Pakistan based on the Unified Theory of Acceptance and Use of Technology Model: An empirical study on financial inclusion in Pakistan

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ABSTRACT

Pakistan has seen a rise in financial technology (Fin-Tech) and mobile device use. The financial sector and entrepreneurs see Fin-Tech as a method to extend business potential, but mobile apps and other digital platforms must be established to explore these possibilities. Mobile app security concerns have skyrocketed, causing issues for users and Fin-Tech innovators. This article empirically explores how Fin-Tech adoption affects users' and organizations' expectations of effort, performance, social impact, facilitating conditions, behavioural intents, and adoption. This paper presents a UTAUT-based model for fin-tech adoption intention. This study examined 518 Bahawalpur residents and workers. Consultant-created online and paper questionnaires covered the study's objectives. Hence, fin-tech adoption is valuable for both the general public and its users. Independent variables moderated behavioural intention and Fin-Tech adoption. Bahawalpur companies and people adopting Fin-Tech can reduce productivity costs and save time. This research can help Bahawalpur residents adopt Fin-Tech.

KEYWORDS

Fin-Tech, Effort Expectancy, Performance Expectancy, Social Influence, Facilitating Conditions, Behavioral Intentions

ACADEMIC PAPER



1. INTRODUCTION

The financial services (FS) business is changing at a faster rate than the rest of the economy due to technology advancements. Fin-Tech, a general term for new business concepts in the financial services sector enabled by new technology, is causing a paradigm shift in the way financial services provide both monetary and non-monetary benefits to the parties involved (Schueffel and Vadana, 2016; Zavolokina, M. Dolata, & G. Schwabe, 2016a). These Fin-Legacy financial organizations are compelling by technology to reevaluate their goals, build new capabilities, and alter their organizational cultures. To put it another way, the Financial Stability Board defines Fin-Tech as "technologically enabled financial innovation that could lead to new business models and applications as well as processes and products that have a meaningful impact on the provision of financial services." (Buchak, Matvos, Piskorski, & Seru, 2018; István; Leong, Sung, & Technology, 2018). Alternatively, Fin-Tech start-ups will gain from technologically enabled skills that are characterized by a higher knowledge intensity and a smaller dependence on their own internal resources (Mention, 2021; Temel, Mention, Torkkeli, & innovation, 2013). FS development, promotion, delivery, and consumption are being transformed by Fin-Tech; there can be no mistake about it (Dapp, Slomka, AG, & Hoffmann, 2014). However, the future of Fin-Tech is still up in the air. In one sense, the fresh momentum is upgrading financial infrastructure and spurring behavioral change, while at the same time undermining existing businesses, business models, and regulatory frameworks.

This socially manufactured Fin-Tech phenomena research is still in its early stages, but it is expanding rapidly (Gomber, Koch, & Siering, 2017; Mention, 2021; Zavolokina, M. Dolata, & G. J. F. I. Schwabe, 2016b). For the first time, (Zavolokina et al., 2016b) provide a case for and against Fin-Tech as a concept and term. a breakthrough in digital technology centered on producing, modifying, improving, and disrupting financial information technology applications and fostering competition in the industry was envisioned as Fin-Tech by drawing on popular media's use of the word "Fin-Tech." There have been recent studies looking at the current state of digital finance research from an entrepreneurial perspective, such as (Gomber et al., 2017) which adopted the premise of digital innovation in financial services. According to their findings, future study should focus on the convergence of business operations, technology, and technological concepts, as well as the sorts of institutions participating in Fin-Tech.

In their study, (Shin & Choi, 2019) proved that Fin-tech is not just a place for new ideas to bloom, but also a significant platform for improving conventional Korean processes, which helps to keep the country's economy growing. According to a global estimate, Fin-tech industry payments account for 84% of total payments. In addition to complementing traditional financial operations, financial technology also creates distinctiveness in financial services. They demonstrated the viability of Korea's developing Fin-tech platform for long-term economic success. In the 06 years from 18.9 billion (2013) to 111.8 billion (2019), The use of financial technology in the banking industry grown six times more rapidly in the US global market, according to the KPMG annual report (2019). Fin-tech is a well-known industry with its own business structures and processes. Fin-tech, according to (Smith & Gregorio, 2017), has made affordable, symmetrical information and low-cost services more accessible.

Pakistan is a developing country that places a high value on technological advancements. For more information on work Pakistan has the potential to be a significant market for Fin-tech growth due to the country's high proportion of teens, rising use with regard to mobile devices and the internet, and increased customer preference for e-commerce and digital transactions. However, individuals are hesitant to adopt new technology due to concerns about unintended consequences and the inherent hazards that go along with it. Despite the fact that financial technology offers many advantages, it is possible to underestimate the perceived dangers associated with various Fin-tech solutions. Due to the lack of numerous coordinated foreign rules for the use of financial technology, such exposures could make digitalized business activities dangerous. In a country, the adoption of financial technology is hindered by new dangers, such as cyber security and intellectual power, anxiety of finding competent and loyal customers, and regulatory ambiguity.



1.1. Challenges faced by Fin-tech

Financial institutions and worldwide incumbents have implemented Fin-tech, as demonstrated by the PwC Global Fin-tech (2017) study. Regulatory ambiguity (48 percent), cultural and management variations (55 percent), and varying business models (40 percent) are only a few of the significant issues facing Fin-tech, as 34 percent. Other incumbents cite regulatory uncertainty and IT security as important challenges 58% 54 percent. Fin-success tech's in rich economies has prompted us to draw attention to the dangers it poses to those in underdeveloped countries who want to use it. Approximately 85% of individuals in Pakistan still conduct cash-based transactions, putting them at risk of financial exclusion, according to. Despite the positive and attractive possibilities for financial technology adoption in Pakistani society, the public's perception of risks such as regulatory ambiguity and operational risk are two types of strategic risk. Discourages adoption "The State of Financial and Digital Inclusion Project" reported in 2017 that Pakistan ranked 16th out of 26 for Fin-tech inclusion, indicating a precarious scenario.

Fin-tech may have had a huge impact on the financial industry's future, but adoption is still uncertain due to customer mistrust about the hazards that come along with it. According to (Ryu & H.-S., 2018b) financial technology adoption is hindered by fear of the unknown, which prevents people from implementing new financial technology. Financial risk (financial loss, additional fee and transaction costs) is one of the adoption barriers, followed by legal risk (uncertainty regarding regulatory requirements for adoption), then security risk (privacy concerns and inadequate security technologies), and finally operational risk (inadequacy in processing and systematic problems with Fin-tech companies). In the difficult phase of mitigating such possible risks and increasing the usage of Fin-tech, Fin-tech companies are. In mitigating the risks connected with digital technology adoption for financial transactions, auditors of a corporation can play a vital role by developing effective protection plans that accept disruptions in procedures related with Fin-tech developments. It has been stated by (Gomber, Kauffman, Parker, & Weber, 2018) that financial institutions must establish effective defensive strategies to control disruptions in processes caused by the emergence of financial technology.

Numerous non-industrial countries have recently offered their views on Blade tech in order to obtain economic progress and advancement. Non-industrial countries sought to modernize their monetary frameworks in order to cope with the global financial crisis of 2008. The significance of Balance tech is widely emphasized by industry experts. The world's poorest countries surround Pakistan, India, and Bangladesh before climate change has a chance to take hold. As a result, these countries face environmental suffering. Pakistan, as a non-industrial country, suffers from numerous environmental, monetary, political, and social problems, all of which should have taken into consideration when planning for Pakistan's future growth. The concept of bringing Blade tech into the West has found support in a variety of non-industrial nations. Also in agricultural nations, there are some shortcomings like a lack of public authority assistance and customer fascination with energy ventures or emanation decrease exercises, as well as the issue of stopping quick loans to areas with normal high contamination and discharge like oil fields and coal power stations. There are also insufficient forerunners in receiving Blade Tech because of a lack of information on business cases, in agricultural nations (Shafique, & Majeed, 2020).

With the help of trendsetters and academics, fin-tech is quickly becoming a global wonder. It is already attracting the attention of controllers. Fin-tech, as a whole, refers to financial services enabled by cutting-edge innovation, as well as the strategies that go along with those services. Fin-tech, or financial technology, can used to describe any development in the way firms engage with, deliver, and consumer financial services.

A trust is a multidimensional wonder, according to (Lewis & Weigert, 1985), and it has a considerable impact on corporate relationships. The trustworthiness of Fin-Tech development reception is influenced by a number of factors such as the classification of information, the ease with which it is accessible, the respectability with which it is treated, and the consistency with which remote associations can be made (Siau & Shen, 2003; Whitman & Mattord, 2014). Furthermore, trust is fundamentally founded on an



individual's belief that the stage on which they exchange data is secure, as described by (Vance, Elie-Dit-Cosaque, & Straub, 2008) Classes like trustworthiness and accessibility can have a significant impact on trust convictions and aims. Validation also has a significant impact on trust commitments (Siau & Shen, 2003; Vance et al., 2008; Whitman & Mattord, 2014) Vance et al. also pointed out that faith in foundations has an effect on trust in online stages. Data innovation curiosities have certain pieces, as demonstrated by (Vance et al., 2008), components that determine framework quality are important to the concept of trust. Studies conclude that trust and convenience are closely linked. The trust swing in IT development is enhancing by portable exchange commitment and ease of usage.

1.2. Problem statement

Fin-Tech is mostly unknown in Pakistani industry, with a research estimating that 72% of businesses are unaware of it. Numerous obstacles beset fin-Tech development in Pakistan. Pakistan has very few fin-tech firms, and most of the country's fin-tech investment is in the banking industry (Kanwal et al., 2017).

Fin-tech adoption has benefited greatly from the convergence of several technologies. Fin-Tech investment is increasing dramatically over the world. Fin-Tech's in Pakistan, on the other hand, is extremely restricted. The study's goal is to determine the value of financial technology and identify the roadblocks and obstacles that Pakistan has in adopting it.

Because of considering this, our research stands out from similar studies in a number of ways (Jamal, Shafique, Sarwar, & Khan, 2020; O. Shafique & Khan, 2020a; 2020b; Shafique, Khizar, Jamal, Sarwar, & Khan, 2020). To begin, this study examines the risks and benefits of Fin-tech adoption as a whole. Earlier research failed to take into account user perceptions of the benefits and dangers of financial technology. Similarly, prior research overlooked the importance of user trust in the field of financial technology. Therefore, we incorporated the trust component in our research to see if customers were interested in Fin-tech adoption. This is because while making judgments based on risk and benefit analysis, a person considers the trust component. Second, prior research mostly focused on the Fin-tech industry's supply side. This research looked at how Fin-tech users adopt new products and services rather than just the supplier side. A conceptual framework developed by this study was showing to have positive policy implications, especially for financial technology firms.

1.3. Research Hypothesis:

H1: Effort Expectancy has an impact on Behavioral Intention.

H2: Performance Expectancy has an impact on Behavioral Intention.

H3: Social Influence has an impact on Behavioral Intention.

H4: Facilitating Conditions has an impact on Behavioral Intention.

H5: Age moderates the relationship between Performance Expectancy and Behavioral Intentions.

H6: Age moderates the relationship between Effort Expectancy and Behavioral Intentions.

H7: Age moderates the relationship between Social Influence and Behavioral Intentions.

H8: Age moderates the relationship between Facilitating Conditions and Behavioral Intentions.

2. LITERATURE REVIEW

According to Ryu (2018) recently, financial technology services have gotten a lot of attention. The adoption of Fin-tech is viewing by skepticism by certain experts and practitioners due to the significant risks involved even though many feel it has the potential to transform the financial services industry. Since users may be willing or apprehensive to adopt Fin-tech, this study must better understand the elements that influence their decision to adopt. This study suggest a benefit-risk framework based on the net valence framework, which is conceptually anchored in theory of reasoned action and incorporates positive and negative aspects of its adoption. This studies first analyses whether perceived advantage and danger have a substantial impact on Fin-tech adoption intention based on empirical data obtained from 244 Fin-tech users.



If perceived benefits and risks affect Fin-tech adoption intention differently depending on the type of user, this study looks at that. Research shows legal risk has a negative impact on Fin-tech adoption intentions but convenience has a positive one. Different factors influence the disparities between early and late adopters. This study's findings clearly demonstrate the most important variables and impediments to Fin-tech adoption. Several points made in our research, both conceptually and empirically. First, our research illuminated hitherto unseen aspects of client aspirations regarding financial technology. Few empirical researches have done on the perception of Fin-tech adoption, despite the fact that Fin-tech is garnering increasing attention.

This study illustrates customers' decision-making processes, which aids researchers by revealing new information. Our findings demonstrate the advantages and hazard that influence and how much they do to the formulation of adoption intentions. This research contributes to our understanding of how people weigh up several important beliefs about benefits and risks before making a decision. As a result, the decision-making process is more open and transparent. The benefits and risks of financial technology adoption depend on the type of financial technology user. Diffusion rates for new services based on new technologies rely on both the service's own qualities as well as those of its users. Financial technology businesses must therefore take into account their target audiences before positive and negative factors have the predicted integrative effects on Fin-tech adoption intention (Ryu, 2018)

The study's goal is to research the fin-tech idea, map the literature, and identify new directions and opportunities in the sector. SLR attempts to describe fin-tech activity areas, propose a categorization for this literature, and highlight key issues dealt with to date in the sample publications, and point out new research questions in this field for further investigation. This is the reason for performing a Systematic Literature Review (SLR). To summaries, fin-tech is defined as innovative financial services organizations that take advantage of the ease with which people can communicate these days, the ubiquitous nature of the internet, and the capacity to process information in an automated manner. Literature focuses on financial services and developments, addressing themes such as financial industry regulation, local legislation, or the global financial system as a whole Subcategories of research such as network externalities, block chain, and security are all heavily featured in this study, and they represent the most sensitive aspects of digital transformation on a global scale. Finally, topics relating to the operation of financial services focus on the potential for financial loss as a result of several elements in these businesses' business environment (Mehrban et al., 2020).

With therefore much interest being paid to financial technology, it is spreading like wildfire. Because of its steady expansion, new terminologies have emerged in this industry. One of these jargons is 'Fin-Tech'. This phrase used in the financial technology industry to describe a wide range of processes. Information Technology-based apps are typically used to provide required services in businesses or organizations. Other sensitive problems including security, privacy, dangers, and cyber-attacks are included in the definition. It's critical to remember that the growth of Fin-Tech is dependent on the integration of several cutting-edge technologies, such as mobile embedded systems, mobile networks, mobile cloud computing, big data, data analytics techniques, and cloud computing. However, there is a number of security and privacy concerns with this new technology that must solved if it is too accepting by its users (Mehrban et al., 2020).

Modern investors are drowning to the new Fin-Tech market due to its rapid development in the face of rapid technological change. In the current market, there are numerous concepts: E-wallets, Bitcoins, P2Pcrediting, mobile banking, etc. In many ways, many of these instruments are already part of our everyday lives. Without the involvement of banks, people can borrow any amount of credit from other Internet users via specific services, pay with a credit card via mobile devices, and track their expenses and earnings using a card from anywhere. Users no longer have to visit banks and waste time making credit agreements, exchanging currencies, or searching for ATMs to withdraw cash. In addition to Russian rubles, new digital currency can also be used to pay for online purchases. These devices make life a lot less complicated (Damian, Manea, & Knowledge, 2019).



Recently, financial technology services have gotten a lot of attention. Certain experts and practitioners due to the significant risks involved, even though many feel it has the potential to transform the financial services industry, view the adoption of Fin-tech with skepticism. Since users may be willing or apprehensive to adopt Fin-tech, this study must better understand the elements that influence their decision to adopt. This study suggest a benefit-risk framework based on the net valence framework, which is conceptually anchored in theory of reasoned action and incorporates positive and negative aspects of its adoption. This study first explores whether or not perceived advantage and risk have a substantial impact on the desire to adopt fin-tech based on empirical data obtained from 244 users. (Ryu, 2018).

This study's findings clearly demonstrate the most important variables and impediments to Fin-tech adoption. The findings of this study shed light on hitherto unseen aspects of client intentions regarding financial technology. Despite the increased interest in Fin-tech, there are still just a few empirical research on how people actually perceive Fin-tech adoption. Fin-tech adoption in the IS industry necessitates a deeper knowledge before meaningful progress can be made. This research used the positive and negative aspects that have an impact on the results (Ryu, 2018).

Adoption of fin-tech and demonstrates their connection or how they interact together to affect adoption intention and choice. This paper makes an essential contribution to the field of financial technology adoption with both theoretical and empirical demonstrations of the effects of perceived benefit and risk. It shows customers' decision-making process, which helps academics gain new insights. Results show the advantages and hazards that contribute and how much they do to the formulation of adoption intentions. This research contributes to our understanding of how people weigh up several important beliefs about benefits and risks before making a decision. As a result, the decision-making process is more open and transparent. Understanding the Financial Technology Adoption Benefits and Risks Framework (Ryu, 2018).

The use of financial technology has increased dramatically in recent years. Fin-tech adoption is hampering by the emergence of new hazards. Financial technology being used to provide financial services, and there are hazards associated with that. According to the data, a Fin-tech revolution is creating new risks, including operational and regulatory uncertainties, as well as strategic risk. According to the findings of this study, there is a negative correlation between the continuing Fin-tech revolution and the adoption intention of Fin-tech, because of new hazards. People are hesitant to adopt because they are afraid of the hazards involved. Fin-tech auditors using good risk-mitigation procedures can considerably reduce these hazards. A risk management process used to evaluate the moderating role of auditors in managing Fin-tech risks. The study makes use of a variety of quantitative techniques. Information gathered by sending questionnaires to 200 people in Pakistan's fin-tech industry. Stata 14.0 used for statistical analysis to test hypotheses. According to the findings, all perceived hazards rise in tandem with the Fin-tech revolution (Sharma, Dwivedi, Metri, & Rana, 2020).

A growing number of Pakistani consumers favor social media and online shopping, making the country a promising market for fin-tech companies. In addition, the State Bank of Pakistan has good laws that serve as a springboard for the development of Pakistan's fin-tech industry. Despite the fact that restrictions are required, they could pose a threat to a young industry.

Banks must constantly upgrade their technology in order to remain competitive and reach as many clients as possible. For example, mobile banking makes it possible for customers in rural or remote areas to access their accounts at any time. In this work, this study will refer to mobile financial services as "mobile financial services"(Vinayagamoorthy & Sankar, 2012). As to remain competitive and serve as many customers as possible, banks must constantly improve their technology. Clients in rural or remote places can now use mobile banking, for example, to get online anytime and check their balances. This study will just call them "mobile financial services" from now on (Bhatti & commerce, 2007; Sadi & Noordin, 2011). This study looked at the TAM (Technology Acceptance Model), the TPB (Theory Planned Behavior), and the IDT (Innovation Diffusion Model) and found statistical significance in all 13 components, including



perceived utility as well as ease of use as well as individual creativity. It was found that simply introducing M-commerce was not enough through exploratory factor analysis, and that strengthening qualities should be the priority instead of introducing M-commerce as a whole.

Given that perceived usefulness was determined to be crucial among all aspects, it is imperative that services focus on making their clients feel their services are valuable and necessary in order for them to keep up with their busy, modern lives. Customers will be less likely to use services from companies they don't trust if they don't feel secure. This research concluded that trust is a crucial element that service providers should take into account.

Additionally, trust in mobile banking services has dwindled, despite the fact that personal trustworthiness was once a major driver of mobile banking usage development. Trust between customers and vendors are a prerequisite for M-commerce transactions to be accepted. When a client believes that a mobile banking company is capable of developing successful service delivery strategies and providing enough protection against fraud and privacy violations, their adoption (or continuous usage) intentions will rise. When a client believes that a mobile banking company is capable of developing successful service delivery strategies and providing enough protection against fraud and privacy violations, their adoption (or continuous usage) intentions will rise (Stewart, Jürjens, & Security, 2018).

Start-ups face numerous challenges while developing a Fin-Tech product or service. Fintech start-ups face many difficulties when it comes to projecting a clear value proposition for intangible/service Fin-tech offerings and comprehending customers and the product/service market (Altenhain & Heinemann, 2018) Start-ups face numerous challenges while developing a Fin-Tech product or service. Fin-tech start-ups face many difficulties when it comes to projecting a clear value proposition for intangible/service Fin-tech offerings and comprehending customers and the product/service market (Bömer & Schwienbacher, 2018; Cumming & Schwienbacher, 2018) Fin-Tech start-ups face steep upfront costs for securing intellectual property, making it difficult to get operating debt (Lee & Shin, 2018).

Proof of concept development is a heavy barrier for Fin-Tech start-ups seeking early-stage investment due to the difficulties in demonstrating a proven business model, discovering the appropriate market, and assessing customer/user demographics. For Fin-Tech start-ups to be successful, they need competencies related to recognizing innovation connections. Fin-Tech companies need dynamic screening, auditing, road mapping, and forecasting capabilities that are continually evolving in order to remain competitive. However, in order for incumbents to benefit from the key technological breakthroughs in Fin-Tech product and service offerings, they must switch from using legacy systems to using more efficient new ways (Zhang et al., 2019). Fin-Tech start-ups must also deal with a lack of qualified workers. Companies in the Fin-Tech sector are dealing with a significant issue because of the transition in consumer engagement from human to digital.

2.1. TAM, TRA, TPB and UTAUT Theories

There are a number of models available to aid in the study of mobile banking adoption behavior. These models incorporate a number of factors that assess a user's intent and attitude toward mobile banking. These are the models this study is talking about: 1) Rational-action theory (TRA) Acceptance Model for New Technology (TAM) Planned Behavior Theory (TPB) 4) Theory of Innovation Diffusion (IDT) 5) The Unified Theory of Technology Acceptance and Use (UTAUT).

2.1.1. Theory of Reasoned Action (TRA)

The model given by (Ajzen & Fishbein, 1975) suggests that a person's actual behavior can be governed by their behavioral purpose together with their beliefs and subjective norms regarding their behavior. Subjective standards are those that are determined by the individual. An individual's impression of other's view about his/her particular behaviour, if he should execute a certain behaviour or not and A person's



positive or negative attitude towards the conducted conduct is classified as attitude towards action. As a result, TRA is a valuable model for explaining a person's actual behavior.

2.1.2. Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is a widely-used theoretical framework that explains how users adopt and accept new information technology (IT) systems. Developed by Fred Davis in the late 1980s, the TAM has since been modified and extended by various researchers to reflect changes in technology and user behavior. The original TAM proposes that perceived usefulness (PU) and perceived ease of use (PEOU) are the primary determinants of user acceptance of IT. PU refers to the degree to which users believe that a technology will enhance their performance or productivity, while PEOU refers to the degree to which a technology is perceived as being easy to use. According to the TAM, these two factors directly influence users' attitudes toward using a technology, which in turn affects their intention to use it (Jariyapan, Mattayaphutron, Gillani, & Shafique, 2022).

The TAM is Fred Davis's (1986) framework for understanding how people respond to new technologies. While evaluating a system's perceived utility, one looks at how much the user thinks it will help them in their daily lives. A user's perception of a system's usability is measured by how little they anticipate having to put forth in order to make full use of it. According to him, a user's disposition towards adopting new technology or an information system is based on their impressions of its usability and utility.

Since its introduction, the TAM has been used in a variety of studies to investigate user acceptance of various IT systems, such as e-commerce websites, mobile apps, and social media platforms. Many studies have found strong support for the TAM's core propositions, with PU and PEOU consistently predicting user attitudes and intention to use technology.

In recent years, researchers have proposed various extensions and modifications to the original TAM to better reflect the complex nature of user behavior and the evolving technological landscape. For example, the TAM2 model incorporates subjective norms and image as additional determinants of user acceptance, while the Unified Theory of Acceptance and Use of Technology (UTAUT) adds performance expectancy, effort expectancy, social influence, and facilitating conditions to the model.

Despite these modifications, the TAM remains a valuable tool for understanding user acceptance of new IT systems. By providing a clear framework for analyzing the factors that influence user behavior, the TAM can help researchers and practitioners design and implement more effective technology solutions.

2.1.2.1. Performance Expectancy

“Performance Expectancy (PE) is the degree to which an individual believes that using the system will help him/her to attain gains in job performance.” Perceived usefulness and perceived reliability are the other models' performance expectancy constructs (TAM, and combined TAM-TPB), as the strongest predictor of intention in each model, this concept held up in both voluntary and compulsory circumstances. According to research, age and gender moderate the impact of performance expectations on behavioral intentions, with the effect being greater for men, especially younger workers.

Performance Expectancy forecasts how people will react when their expectations not met. The most interesting finding was people who expected to do poorly but ended up doing exceptionally well in comparison to expectations. By erasing a successful performance, by changing right responses, the person's dissonance between expecting to do poorly and actually doing well minimized, apparently. In contrast to those who expected to perform poorly, those who did well changed more of their responses than those who expected to perform badly but did not do well in the test.

2.1.2.2. Effort expectancy

Effort Expectancy is the degree of ease with which a system may be used. Structures seen in other models, such as perceived ease of use, capture this notion (TAM). The idea was important in both voluntary and



mandatory situations in each model, and as predicted from the literature, it was only significant after training. Age, experience, and gender, according to studies, all limit the influence of effort expectation on behavioural intentions. This indicates that young ladies and older professionals have a higher influence than younger individuals at the start of their careers.

2.1.2.3. Social Influence

The degree to which a person believes important individuals believe he or she should use the new method known as social influence. Existing models include similar concepts, such as subjective norms. When comparing the two models, it discovered that this construct functioned in a similar manner; it is insignificant when using voluntarily and becomes significant when required. In required contexts, for example, the impact is attributed to compliance and seems significant only during the early phases of individual experience and when rewards/punishment are relevant. Social influence in voluntary contexts, on the other hand, operates through influencing how people view a certain technical innovation (what is known as internalisation and identification) According to studies, gender, age, experience, and voluntariness are all believed to modify the impact of social impacts on behavioural intentions.

2.1.2.4. Facilitating conditions

The term "Facilities Conditions" describes a user's confidence in the reliability of a company's and a system's underlying hardware and software. Perceived behavioral control and enabling circumstances make up this description. Both voluntary and compulsory training settings have comparable relationships in the first period to distinguish between one's aim and the structure created according to model comparison, but this effect diminishes in the second period in both models according to the comparison. According to the findings, when both performance expectation and effort expectancy constructs are present, facilitating variables become irrelevant and inconsistent with DTPB/TPB enabling circumstances. This effect is expected to expand as people gain more technological knowledge and discover more places for assistance and support. The older a worker is, the more likely it is that favourable conditions will have a smaller impact on their consumption; this is especially true for older workers who have more experience.

2.1.2.5. Behavioral intention

The more intently a someone has the belief that they will carry out a particular activity, the more likely it is that they will engage in that behaviour. These are the beliefs held by the majority of people with regard to whether or not the activity should be accepted (Jariyapan, Mattayaphutron, Gillani, & Shafique, 2022). Researchers have uncovered a diverse selection of models that provide assistance to them in understanding the essential variables that impact the attitudes and intentions of the FinTech business. In the next section, we are going to discuss these particular models.

2.1.3. Theory of Planned Behavior (TPB)

An addition to TRA's Theory of Planned Behavior is Perceived Behavioral Control, which takes into account one more construct (PBC). In other words, when people believe they have perceived behavioral control, they believe they are capable of controlling a specific behavior. Control beliefs and perceived power or perceived facilitation have an impact on PBC as well. Perceived presence of those things that can help or hinder behavior is referring to as control beliefs. A person's ability to use a certain system is defined their perceived authority (Jariyapan, Mattayaphutron, Gillani, & Shafique, 2022).

2.1.4. Unified Theory of Acceptance and Use of Technology Model (UTAUT) Model:

The Unified Theory of Acceptance and Use of Technology (UTAUT) model has been widely used in technology adoption research since its inception in 2005. Jariyapan, Mattayaphutron, Gillani, & Shafique (2022) conducted a literature review on the UTAUT model to summarize and synthesize the current state of research in this field.



The UTAUT model was developed to explain the factors that influence an individual's decision to adopt and use technology. It is based on four constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions. Performance expectancy refers to the degree to which an individual believes that using a particular technology will enhance their performance. Effort expectancy refers to the degree to which an individual believes that using a particular technology will be easy. Social influence refers to the degree to which an individual perceives that others expect them to use a particular technology. Facilitating conditions refer to the degree to which an individual believes that the necessary resources and support are available to use a particular technology.

This model was built by using the Technological Acceptance Model, Motivational Model, Theory of Planned Behavior, Combination of the TAM and TPB (C-TAM-TPB), PC Usage Model, Innovation Diffusion Theory, and Social Cognitive Theory (Venkatesh, Morris, Davis, & Davis, 2003). According to Venkatesh, Thong, & Xu (2012), an individual's belief is that adopting the system will boost work performance. Social Influence defined performance expectation as an individual's belief that adopting the system will boost work performance. Enabling Circumstances (Venkatesh et al., 2012) enable work performance increases.

In conclusion, the UTAUT model has been widely used to understand technology adoption and use. While the model has some limitations, it provides a useful framework for researchers to investigate the factors that influence technology adoption and use. Future research can build on the UTAUT model by incorporating individual differences and emotions to gain a more comprehensive understanding of technology adoption and use.

The study seeks to expand the UTAUT paradigm and improve technology acceptance knowledge. The study's key objectives are:

- 1-To what extent can a non-Western culture use the UTAUT paradigm successfully
- 2-Extend the UTAUT to take into consideration online usage patterns.
- 3-Consider how website quality judgments play a role in determining online activity behavior.

Theoretical, practical, and academic research purposes are also possible:

The paper analyses western models applied to non-western cultures and offers an amendment to the UTAUT model to account for internet usage behaviour. This extension examines how website design quality affects online usage. Academically, the research would lay the groundwork for future model expansion and application research (Triandis, 1979; Vallerand, 2000).

2.2. Research model

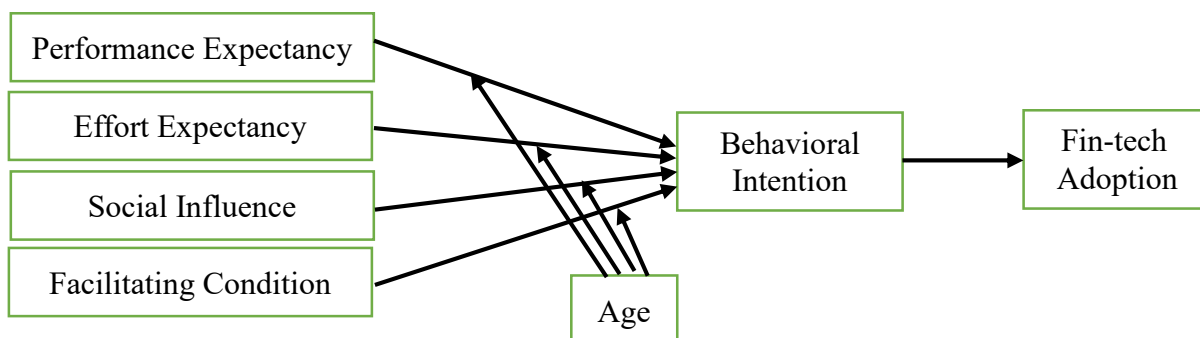


FIGURE 1. Research Model

3. METHODOLOGY

The purpose of research is to describe the factors affecting the adoption of Fin-tech in Pakistan based on the Unified Theory of Acceptance and Use of Technology Model: An empirical study on financial inclusion in Pakistan. It is the most crucial part of any research, as the validity of research is eventually assessed



(Kallet, 2004). This study primarily makes use of qualitative methods, particularly positivist ones (Li, Easterby-Smith, & Bartunek, 2009). In it, quantitative properties are investigating in a systematic and scientific manner.

As a primary data source, the researcher in this study chose to collect data using a verified structured questionnaire. Fin-tech will be examined in this study. As a result, the population for the current study includes all of the people of Pakistan who have some knowledge about fin-tech. To calculate sample size, this study utilized the sample size table (Krejcie, Morgan, & measurement, 1970) and sample size calculator (Siegle & Schuler, 2000). Therefore, population size having 95% confidence level and the error of margins 5% results in a sample size of 518. Based on the above parameters, required sampling units as per sample size were selected for data collection and 518 questionnaires were finally included in data analysis. For the reasons listed, researchers chose cluster area sampling as the sampling strategy for this research (Jamal et al., 2021; Shafique, 2017; Shafique & Habib, 2020; Shafique & Khan, 2020a; 2020b; Shafique & Siddique, 2020). This study used Smart PLS for data analysis (Ahmad, Shafique & Jamal, 2020; Ain & Shafique, 2022; Hameed, Hashmi, Ali, & Arif, 2017; Hameed, Nadeem, Azeem, Aljumah, & Adeyemi, 2018; Hameed & Naveed, 2019; Jamal et al., 2021; Jamal, Shafique, Sarwar, & Khan, 2020; Jariyapan, Mattayaphutrong, Gillani, & Shafique, 2022; Shafique, 2017; Shafique & Ahmad, 2022; Shafique & Habib, 2020; Shafique & Khan, 2020a; 2020b; Shafique, Khizar, Jamal, Sarwar, & Khan, 2020; Shafique & Majeed, 2020; Shafique & Siddique, 2020).

4. ANALYSIS

4.1. Demographics Analysis

A Breakdown by Gender is Shown in the Following Table. Among the 518 people that filled out the survey, 339 identified as male. These people account for 65.44 percent of all respondents. There were 179 female responders out of a total of 518, or 34.56 percent. The low rate at which women find work after completing their education in this area is a major contributor to the gender gap in political engagement.

Table 1. Demographic Analysis

Demographics	Total 518	Percentage
Gender		
Male	339	65.44
Female	179	34.56
Age		
<26	338	65.25
26-35	140	27.03
36-45	27	5.21
<45	3	0.58
Prefer not to say	10	1.93
Education		
Matric	5	0.97
FSc	90	17.37
Bachelor	213	41.12
Masters	125	24.13
M. Phil	70	13.51
PhD	12	2.32
Prefer not to say	3	0.58
Currently use Fin-tech Apps to Make Payments		
Yes	282	54.44
No	236	45.56
Currently use Fin-tech Apps to Transfer Money		
Yes	283	54.63
No	235	45.37

4.2. PLS Results Analysis and Discussions

4.2.1. Measurement Model

We evaluate measurement models using outer loadings, CR, AVE, discriminate validity, and convergent validity. Convergent validity was investigated first (Hair, Black, Babin, Anderson, & Tatham, 2006). Table 2 reveals that all object loadings surpassed the acceptable 0.6. (Chin, 1998). CR and AVE values above the suggested levels of 0.7 and 0.5, respectively (Hair et al., 2006). A comparison of loadings across columns in Table 1 shows that each indicator's loadings on its own construct are always larger than cross loadings with other constructs.

4.2.2. Validity and Reliability for Constructs



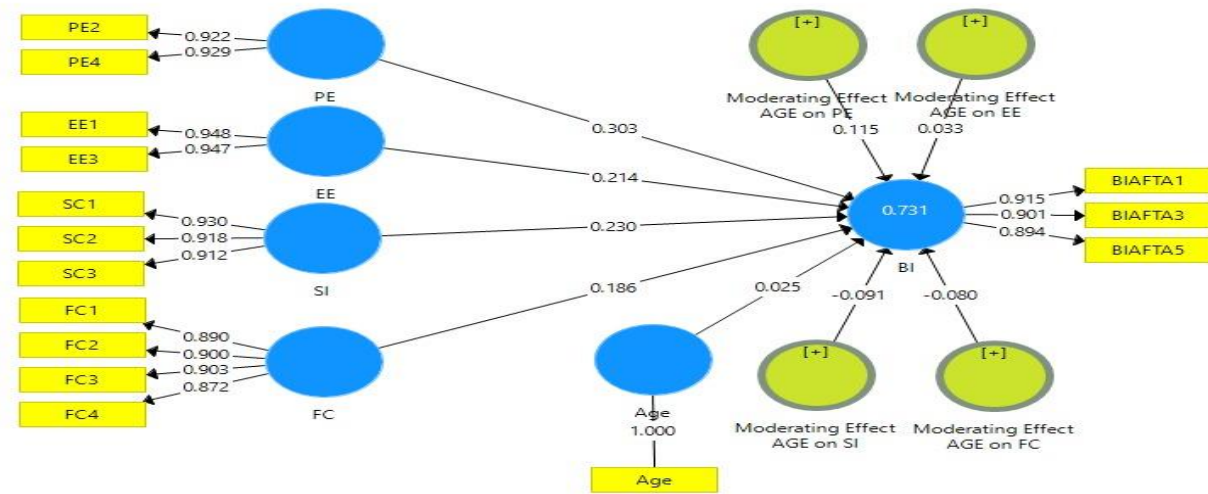


FIGURE 2. PLS Algorithm Interaction

Table 2. Validity and Reliability for Constructs

	Loading	AVE	CR	Cronbach's Alpha
Behavioral Intention to Use		0.816	0.930	0.887
BIAFTA1	0.915			
BIAFTA3	0.901			
BIAFTA5	0.894			
Effort Expectancy		0.795	0.946	0.886
EE1	0.948			
EE3	0.947			
Facilitating Conditions		0.795	0.939	0.914
FC1	0.890			
FC2	0.900			
FC3	0.903			
FC4	0.872			
Performance Expectancy		0.857	0.923	0.833
PE2	0.922			
PE4	0.929			
Social Influence		0.847	0.943	0.909
SC1	0.930			
SC2	0.918			
SC3	0.912			

Table 3. Discriminant Validity (Fornell-Larker Criterion)

	BI	EE	FC	PE	SI
BI	0.903				
EE	0.769	0.947			
FC	0.766	0.731	0.891		
PE	-0.003	0.495	0.671	0.926	
SI	0.144	0.467	0.812	0.721	0.920

Notes: The square root of average variance extracted of every multi-item construct is shown on the main diagonal; RE: escape and recognition; BI; Behavioral Intentioned; Effort Expectancy, FC; Facilitating Conditions, PE; Performance Expectancy and SI; Social Influence.



Table 4. Cross Loadings

	BI	EE	FC	PE	SI
BIAFTA1	0.915	0.699	0.706	0.709	0.683
BIAFTA3	0.901	0.716	0.656	0.712	0.679
BIAFTA5	0.894	0.668	0.712	0.667	0.711
EE1	0.732	0.948	0.712	0.734	0.750
EE3	0.724	0.947	0.672	0.706	0.734
FC1	0.665	0.675	0.890	0.696	0.713
FC2	0.713	0.634	0.900	0.707	0.698
FC3	0.694	0.685	0.903	0.673	0.712
FC4	0.655	0.612	0.872	0.620	0.665
PE2	0.696	0.705	0.665	0.922	0.627
PE4	0.731	0.703	0.735	0.929	0.705
SI1	0.702	0.759	0.715	0.655	0.930
SI2	0.727	0.688	0.731	0.660	0.918
SI3	0.682	0.717	0.711	0.674	0.912

Notes: Bold values are loadings for items which are above the recommended value of 0.5; AVE: Average variance extracted; BI; Behavioral Intention, EE; Effort Expectancy, FC; Facilitating Conditions, PE; Performance Expectancy and SI; Social Influence.

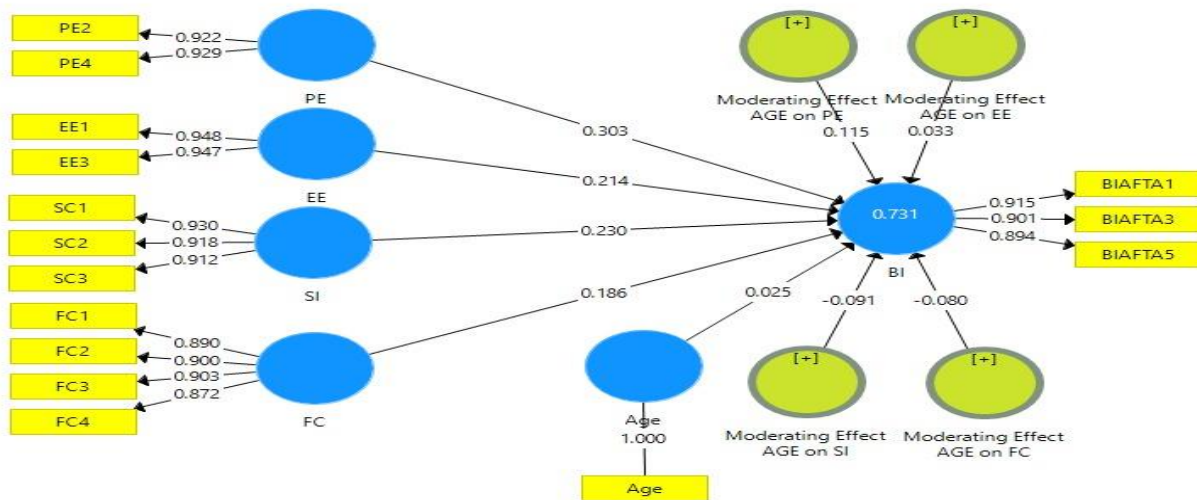


FIGURE 3. Bootstrapping

Another criterion used for discrimination validity is Heterotrait Monotrait Ratio of Correlation (HTMT). According to this criterion values of the Heterotrait Monotrait Ratio of Correlation (HTMT) should not be more than 0.90. According to the table 5 HTMT values for all the latent variables are less the threshold value of 0.90. Hence, the assumptions of discriminate validity are supported again.

Table 5. Discriminant Validity (Heterotrait-Monotrait Ratio (HTMT))

	BI	EE	FC	PE	SI
BI					
EE	0.867				
FC	0.850	0.812			
PE	0.896	0.885	0.866		
SI	0.852	0.873	0.857	0.827	

Notes: AVE: Average variance extracted; BI; Behavioral Intention, EE; Effort Expectancy, FC; Facilitating Conditions, PE; Performance Expectancy and SI; Social Influence.



Table 6. Goodness of Fit (GoF) Index

	AVE	R Square
BI	0.816	0.731
EE	0.897	
FC	0.795	
PE	0.857	
SI	0.847	

Notes: AVE: Average variance extracted; BI; Behavioral Intention, EE; Effort Expectancy, FC; Facilitating Conditions, PE; Performance Expectancy and SI; Social Influence.

Table 7. Structural Estimate (Hypothesis Testing)

	Standard Beta	T Statistics	P Values	Decisions
EE -> BI	0.214	3.746	0.000	Supported
FC -> BI	0.186	3.198	0.001	Supported
PE -> BI	0.303	5.268	0.000	Supported
SI -> BI	0.230	4.200	0.000	Supported
Moderating Effect AGE on EE -> BI	0.033	0.566	0.571	Non-Supported
Moderating Effect AGE on FC -> BI	-0.080	1.621	0.106	Non-Supported
Moderating Effect AGE on PE -> BI	0.115	2.119	0.035	Supported
Moderating Effect AGE on SI -> BI	-0.091	2.155	0.032	Supported

5. DISCUSSION AND CONCLUSION

5.1. Limitations of the study

There is now a comprehensive roadmap for the adoption of Fin-Tech by both the public and the industry in Bahawalpur Pakistan, especially with the current research. This study's framework based on four factors, including mediator Behavioral Intention and moderator Age, which both influence Fin-tech adoption. It affects everyone in the Bahawalpur region, including both residents and businesses. The industrial sector in the Bahawalpur region is extremely competitive, as it is the most important operating sector in today's world.

This research done in Pakistan, but the results could have been different if it had done in another country where technology acceptance is different. Because Fin-Tech adoption appears to be much higher in developed countries than in Pakistan, this study believes the results would be different if the research were conducting there. As a result, our findings are limited to Pakistan and the city of Bahawalpur.

5.2. Discussion

Behavioral Intention is a dependent variable, and Age is a moderating variable in this study. The researcher examines the relationship between these variables. On the other hand, in this study also examine that Age has moderating effect among four variables (EE, PE, SI, and FC). The result of the study is that EE, PE has significant impact, and on the other hand, SI and FC has insignificant impact. Here, this study conducted an empirical investigation into the most important factors, namely: effort expectancy, performance expectancy, social influence, facilitating conditions, behavioral intentions that enhanced the intention to adopt the Fin-Tech, based on UTAUT theory.

5.3. Conclusion

These findings are presenting in this section in accordance with the examination's goals, as announced in the previous section. The primary goal of this study was to identify the factors that would influence whether or not the Bahawalpur region adopted Fin-Tech. Researchers' findings show that as components take on their accountabilities in the help industry, reliability enhances. There will be more information available



about the importance of components that help the public and industries in Bahawalpur adopt Fin-Tech since this discovery has made.

Independent variables (PE, SI, EE and FC) have a mediating influence on Behavioral Intention and Age has a moderating effect on all Independent variables, and similarly on Fin-tech adoption and Behavioral Intention plays a vital role in the adoption of Fin-Tech in Bahawalpur. These findings come from Bahawalpur's beneficial industries.

As a result, the adoption of fin-tech has significant value and is in a strong position for the general population as well as for the sectors that use it. Behavioral intention and Fin-Tech adoption found to be moderately affecting by independent variables. Since companies and individuals are using Fin-Tech in Bahawalpur, they are able to lower their productivity costs and save time for those companies.

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Ethics statement

The Research meets all ethical standards. The patients/participants provided their written informed consent to participate in this study.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Author contributions

MA, RZH, and ANS: conceptualization, methodology, instrument, and writing—original draft. MA and RZH: conceptualization, data collection, formal analysis, and writing—revision. All authors contributed to the article and approved the submitted version.

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