

COVID-19 Emergency and Changes in the Usage Intention of Mobile Banking Services in Pakistani Peri-Urban Areas

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Abstract

This study demonstrates the usage intention of mobile banking services by Pakistanis living in peri-urban areas of Punjab in the time of COVID-19 emergency by adapting the technology acceptance model (TAM) and technology model of readiness (TR). Understanding the relationships between the determinants of usage intention helps the management of Pakistani banks to run the gamut in its mobile banking services in Pakistani outskirts even when the COVID-19 pandemic is over. To test this relationship, data was collected (n=392) from the four largest cities of Punjab by using convenience sampling techniques. The data was analyzed by hierarchical regression using SPSS 19.

The results indicate that the proposed model verified the effect of Positive TR (Optimism, Innovation) and hostile TR (Insecurity, Discomfort), perceived usefulness and behavioral intention towards the use of mobile banking, especially in the period of COVID-19 pandemic. It appears that the COVID-19 pandemic has changed the psychological processes of people living in peri-urban (Lahore, Faisalabad and Multan) and outskirts to use mobile banking services continuingly. This research examined the perception of people living in the peri-urban areas of Punjab, Pakistan, to use mobile banking services for initially applying the Technology Readiness acceptance model (TRAM) with distinct roles of Technology readiness. Furthermore, mediating effects of perceived usefulness are determined between TR and Behavioral intention regarding the use of mobile banking.

Keywords: Technology readiness acceptance model (TRAM), Optimism, Innovativeness, Discomfort, Insecurity, Perceived usefulness (PU), Pakistani Peri-Urban Areas, COVID-19 Pandemic.

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1. Introduction

Mobile phone diffusion in developing countries, including Pakistan, has stemmed from an exponential upturn in offering mobile banking services. However, using mobile banking services has experienced different diffusion paths within the Pakistani market. Currently, the COVID-19 pandemic and the need for social distancing made using mobile banking services a key vector for using financial services. At the onset of the current pandemic COVID-19, many Pakistanis have started using their mobile devices, especially for payment of utility bills, transferring funds, and online shopping. The trend in the use of mobile banking services is not only witnessed in urban areas but also in the outskirts, where people usually seem reluctant to use mobile banking services. Thus, during the lockdown time, Pakistani banks up scaled the mobile banking infrastructure, and the number of mobile banking service providers increased from 09% to 27%. Currently, a 17% increase in registered users and a 35% increase in mobile banking activity has been reported only in Peri-urban areas of Pakistan.

Mobile banking has provided the opportunities those allow the banking customers and nonbanking customers to avail financial services, including payments, transfer of funds, and deposits, lending and borrowing money, and transferring remittances via mobile devices. Mobile wallets could be seen as means of the addition of mobile banking in which customers can collect their information for financial transactions. Currently, seven mobile wallets are available in Pakistan, and only two market players; Easy Paisa and Jazz Cash have a combined market share of 87%. Further, the latest statistics published by Pakistan Telecommunication Authority showed that rate of tele density in Pakistan has reached 85.94%, with 189 million cellular subscribers, 108 million 3G/4G subscribers, and 2 million basic telephony subscribers (PTA, 2021). Thus, the high rate of tele density in Pakistan additionally, the growing pandemic crisis will probably result in more consumers' adoption of mobile banking services at a staggering rate in Pakistan.

Technology-induced banking brings closer to its customers through the offering of flexible, customized, hassle-free, and delightful service encounters (Singh & Srivastava, 2020). In line with physical branch banking, banks offer multiple cost-effective and efficient services, such as ATMs, online banking, and mobile banking. Mobile banking lets clients perform banking transactions using a mobile device anywhere and time (Shankar & Jebarajakirthy, 2019). Nevertheless, mobile banking offers unique services to customers, and banks are encouraging customers concerning the adoption of mobile banking services.

Prior research expresses that banks in Pakistan have played a significant role in providing new and innovative financial services via mobile devices (Akhtar, Irfan,

Sarwar, & Rashid, 2019). The Banking sector and telecommunication companies are working together to bring people under the financial umbrella through the easy and attractive mobile banking services in Pakistan. Especially the people who are using smart phones and living in remote areas or small towns can also access mobile banking services and wallets (Kiani & Gillani, 2020). Mobile banking services are transforming from face-to-face and brick-and-mortar to technology-mediated, value co-creation and customer-centric services (Geebren et al., 2021). Similarly, previous research identified five variables, system quality, information quality, service quality, structural insurance, and task characteristics in their conceptual model that affects customer trust in mobile banking (Geebren et al., 2021) Trust acts as a mediator in the interactions between the independent variables and satisfaction. Angelia et al. (2021), Contribution is made by adding attitude factors to the combo of task technology fit, trust, and UTAUT models, which significantly affect behavioral intentions.

Mobile banking technologies, especially those related to data storing, retrieving, fetching, analyzing and altering, are moving toward artificial intelligence (AI) in their digital and mobile platforms (Khrais & Shidwan, 2020). The assessment of artificial intelligence in mobile banking reflects the level of satisfaction of respondents toward the review of mobile banking services or applications (Curran & Meuter, 2005; Gummerus et al., 2019; Payne et al., 2021). The majority of these investigations (seven studies) were carried out in the USA, with Korea coming in second with five studies. It can be observed that the scientific literature on research in developing and underdeveloped countries is inadequate (Khraim et al., 2011). Numerous studies have been conducted in Pakistan to examine how perceptions of risk and trust affect the uptake of mobile banking (Noreen et al., 2021). Similarly, another research has been done to evaluate the barriers to the adoption of mobile banking services in Pakistan (Siyal et al., 2019).

Mobile banking services and wallets, a comparatively new fantasy in Pakistan, have growing dedication of researchers. Meanwhile, there is not so much prior research about mobile banking in the Pakistan sector.

In this study, two research questions are investigated. It first looks into the factors that affect usage intention and motivating the customers to adopt mobile banking services. In what way do the constructs of using the technology readiness acceptance model (TRAM) explains the utilization of mobile banking services in Pakistani outskirts. Second, does the perceived usefulness (PU) advance the clarification of usage intention vis-à-vis mobile banking services during a COVID-19 emergency?

There are two presented contributions of this study. Firstly, it enlarges prior studies that have canned mobile banking services in Pakistan by recruiting the sample from

peri-urban areas and offering an altered set of all possible variables proposed by former researchers (Abbas et al., 2019; Rizvi et al., 2017). Additionally, it places itself in mobile banking literature, proposing a new amalgamation of behavioral variables affecting usage intention. In addition, it investigates the factors persuading the use of mobile banking services in Pakistani peri-urban areas. There is a deficiency in exploring the characteristics of the diffusion of mobile banking, especially in peri-urban regions in developing. This study investigates the diffusion of mobile banking in peri-urban areas of a developing nation.

Literature Review

Recently, the use of mobile phones for financial services, including mobile banking, has extended globally. In Pakistan, with a coverage rate of 85.94% of the population, mobile phones have become essential in expanding the outreach of banking transactions in rural and peri-urban areas. In such places, many residents are either deprived of conventional banking services or reluctant to use mobile technology for banking services. However, the influence of mobile banking on the changing aspects of financial exclusion is significant. In addition to including the financial services coverage for includes the exclusions, it has played a pivotal role in expanding the coverage of conventional banking services.

The COVID-19 outbreak has reshaped daily life, including how banks and customers interact. To enclose the influences of COVID-19 at an early stage, The Government of Pakistan enforced a nationwide intelligent lockdown starting from mid-March 2020. In the wake of the COVID-19 emergency, the pandemic has pushed the use of mobile banking services by customers residing in rural and peri-urban areas of Pakistan. During the COVID-19 pandemic, the steadily growing use of mobile banking cannot be only attributed to the increase in the provision of mobile banking services. As such, it is pertinent to explain the usage intention of mobile banking services to better understand innovation adoption and diffusion during the wake of an emergency.

The existing literature indicates that multiple theories offered insights to explain user beliefs, motivation and behavioral intentions relating to innovation diffusion (Lin, 2011; Purwanegara et al. 2014; Zhou, 2012). The technology acceptance model (TAM), theory of planned behavior (TPB), innovation diffusion theory and theory of reasoned action are examples of these (Oruç & Tatar, 2017). Among these, TAM appeared to be a valid and extensively used explanation for the diffusion of mobile banking services (Abbas et al. 2018; Mostafa & Eneizan, 2018; Mutahar et al. 2018; Chaouali et al. 2017). Shaikh and Karjaluo (2015) offered a systemic review of fifty-five (55) articles examining the adoption of Mobile banking and thereby concluded

that TAM has been the most frequently applied theoretical discourse to predict the customers' usage intention.

Though the TAM appears to be superior to other competing theoretical discourses in understanding the nuances of innovation adoption and diffusion such as mobile banking services, the TAM has its limitations regarding context-based usage intention, and consumers' personality (Benbasat & Barki, 2007; Venkatesh et al., 2007). Therefore, there is a need to explore further variables those may affect the extension of TAM.

2. Technology Readiness (TR)

TR is defined as "It is the trend among customers towards use of new technologies to achieve work-related goals" (Parasuraman, 2000). It suggests four psychological factors (i.e. beliefs, feelings, perceptions and motivations), two drivers (i.e. optimism and innovativeness) which are positive factors about motivation regarding the acceptance of new technology and other are two inhibitors (i.e. discomfort and insecurity) which are negative factors about restraining the acceptance of new technology (Parasuraman, 2000).

Table: Technology Readiness constructs

Constructs	Definitions
Optimism	Optimism states to a personal conviction that offers expanded control, adaptability and productivity to individuals" in their daily lives and achieving work-related goals (Luppacini, 2005).
Innovativeness	Innovativeness reflects people's propensity to become thought pioneers in testing innovative products and services (Rose & Fogarty, 2010).
Discomfort	Discomfort reflects individuals' views of an absence of power and control over using new products and services thereby lacking self-assurance when consuming technologies (Hernandez et al., 2001).
Insecurity	Insecurity refers to individuals' suspicion of technology, thereby, causing uncertainty, fear and suspicion about the ability of innovative products and services to work appropriately (Parasuraman & Colby, 2015).

It is noted that the positive factors (Optimism & Innovativeness) and negative factors (Discomfort & Insecurity) of TR are not ensuring any users' competency in embracing innovation (Parasuraman, 2000; Parasuraman & Colby, 2015). Positive TR that contains people may not be user of innovations but may be negative TR that contains people familiar with using innovation. Further, mobile banking services due to its unique nature of innovation tend to expose an exclusive profile as associated with supplementary digital products or services (Kim et al., 2019). Consequently, it

is essential to assess consumers' views towards using mobile banking services.

Technology Acceptance Model (TAM)

Theory of Reasoned Action is the foundation of TAM (Fishbein & Ajzen, 1977), which was proposed to explain individuals' technology-related adoption behavior (Davis, 1989). It has been generally functional to observe computer usage intention across different sampled population and types of innovative computing technologies, such as, Automobile telematics devices for mobile shopping, social media usage and health care technology (Ghazali et al., 2018; sNaqvi et al., 2019; Holden & Karsh, 2010). The TAM consists of two cognitive factors i.e. perceived ease of use (PEOU) and perceived usefulness (PU). These factors are used to understand the opportunities gap between usage intention and actual usage (Davis, 1989; Venkatesh & Davis, 2000).

The PEOU refers to the degree to which free of effort using of the specific system, on the other side PU is the degree to which enhances users' job performance (Davis, 1989). More definitely, the PEOU emphasizes the users' idleness by reducing their efforts after the adoption of new technology. On the other hand, PU emphasized enhancing users' performance after the adoption of technology (Davis, 1989). In the recent past, some scholars found the TAM was an applicable theoretical framework to examine individuals' usage and behavior of adopting mobile banking and E-banking (i.e. Electronic banking) (Chawla & Joshi, 2019; Cho & Chiu, 2020).

Technology Readiness Acceptance Model (TRAM) is about usage intention and adoption behavior of users regarding new technologies (Lin et al., 2007). In the case of adoption and acceptance of new technology, technology readiness (TR) has a critical role for users mediated by PEOU and PU (Lin et al., 2007; Walczuch et al., 2007). TRAM is used in extensive studies of technology adoption of mobile internet services, dietary and fitness apps, social media usage and self-service technologies (Kaushik & Rahman, 2017; Lin & Chang, 2011; Jin, 2013; Oh et al., 2014) and wearable technologies). Most studies on the adoption of health and fitness apps used the TAM theoretical model without taking into account people's attitudes about new technology (Kim et al., 2018; Beldad & Hegner, 2018; Cho & Park, 2016;).

In conclusion, Parasuraman (2000) conceptualized people's general convictions about innovation presented in TR. David (1989) designed the TAM demonstration to examine the clients' mental state and behaviour objectives by applying two key indicators, namely PEOU, PU. According to the study, there is a connection between TR and goals when using perceived usefulness as a mediator in their analysis (Lin et al., 2007).

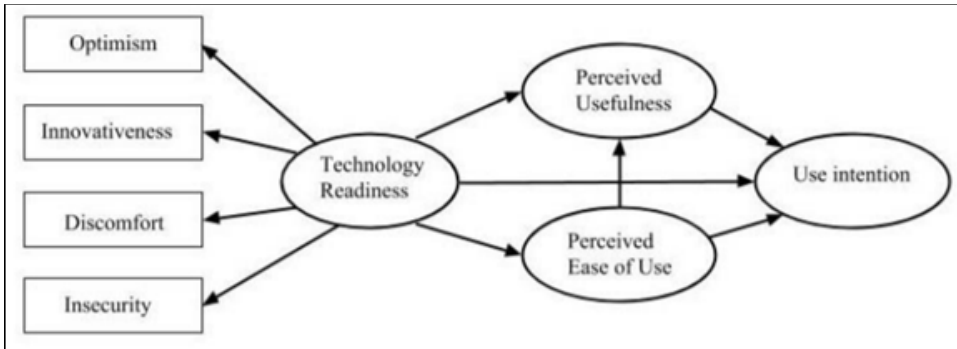


Figure: Technology readiness acceptance model (Source: Lin, Shih & Sher, 2007).

Research Model and Hypotheses Development

Perceived usefulness (PU) describes an individual acceptance of a particular system which is introduced newly in the market. Hence, It want to have been perceived as a person behavior and his/her level of interest to adopt new technology because at the first stage the individual is unaware of the benefits and negative aspects of new technology as well (Munoz-Leiva, Climent-Climent & Liebana-Cabanillas, 2017). However, it takes some time to well-known with the suitable aspects of that technology. The user intention is predicted by perceived usefulness (PU) and it also tells how much this technology will get recognition in the market (Shahbaz et al., 2019).

As per Durodolu (2016), perceived usefulness is a vital motivational factor as well as a determinant toward the goal to utilize technology and innovation. The technology and innovation's level of use determined firstly, how much it is advanced and helpful for the user and how much it will be easy to use. There are several studies to investigate the mediating effect of perceived usefulness such as, the study concentrated on the mediating role of user perceptions in the relationship between accounting students' technology preparedness and Artificial intelligence adoption (Damerji & Salimi, 2021). In this research, the aim of research to mediating effect of perceived usefulness between Technology readiness and behavior intension.

In contrast to apparent convenience, perceived usefulness significantly altered users' expectations; this conclusion was consistent with Davis's (1989). It is accentuating that perceived usefulness is a basic determining factor of expectation to usage because of the reason that purchasers are headed to embrace a development principally due to the value of the advancement for them.

In addition, the construct of technology readiness (Optimism, innovation) has a positive impact on perceived usefulness (Walczuch et al., 2007). Optimism identifies

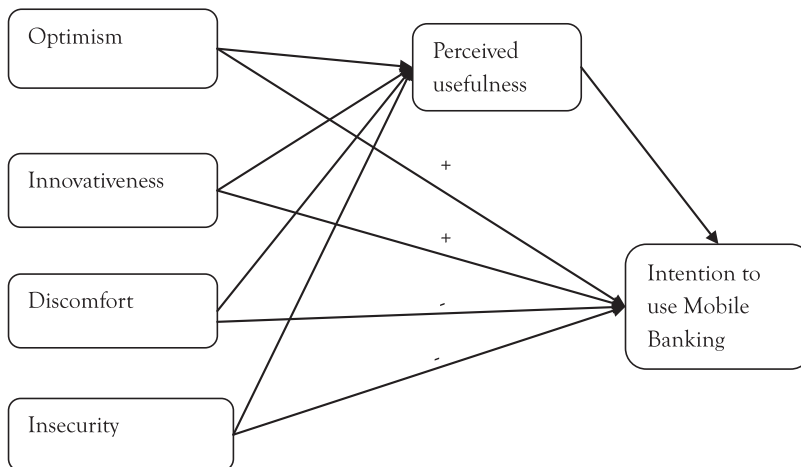
with that conviction that innovation expanded adaptability and productivity of those suggested. Insecurity and discomfort with innovation, on the other hand, lead to low perceived usefulness (Chen et al., 2009). In this manner, Optimism individuals see innovation as being more valuable since they stress less over conceivable negative results. However, prior researchers proposed that optimism and innovativeness may debilitate the impact of apparent helpfulness on conduct goals (Liljander et al., 2006). Likewise, comment that apparent helpfulness is relied upon to impact aims to utilize SSTs all the more emphatically for individuals with small dimensions of TR. Conversely, Chen et al. (2009) presumed that close to insecurity and discomfort with innovation will prompt low perceived usefulness of innovation.

Technology Readiness (TR) and Behavioral Intentions (BI)

Technology nervousness might be altogether identified with key self-service innovation (SST) experience results, for example, informal exchange and rehash utilize (Meuter et al., 2005) while influencing client preliminary on the SSTs. This study has additionally demonstrated that shoppers have low inspiration to utilize SSTs on the grounds due to low technology readiness that they don't expect profits from it. Besides, technology readiness is emphatically identified with conduct objectives for SSTs. Along these lines, this exploration anticipates that technology readiness will positively affect clients' conduct aims as upheld by (Demirci et al., 2008).

Research Framework

In light of the literature survey, there is a need to analyze the relationship between independent variables (Technology Readiness) towards a goal to utilize mobile banking with a mediator (perceived usefulness). The below figure demonstrates the research structure and the hypotheses utilized in this research study.



Research Model

H₁: There is a significant effect of optimism on ITUMB.

H₂: There is a significant impact of innovativeness on ITUMB.

H₃: Discomfort negatively affects ITUMB.

H₄: There is a negative impact of insecurity on ITUMB.

H₅: PU mediates the association between optimism and ITUMB

H₆: PU mediates the association between innovativeness and ITUMB.

H₇: PU mediates the association between discomfort and ITUMB.

H₈: PU mediates the association between insecurity and ITUMB.

Research methodology

A pilot survey was performed by taking twelve responses from eight small business owners and four unbanked users, seeking the feedback on the questionnaire in terms of understanding and clarity. Based on the feedback received, five-question statements were reworded to improve the clarity. Each dimension has Cronbach's α value more than 0.7 which shows reliability. Convenience and purposive sampling were used to recruit 392 respondents in total.

Data Collection

This investigation analyzed the goal to utilize versatile mobile banking among bank's clients. The data was collected from the five most famous banks Pakistan Bank al Habib, Mezan Bank, United Bank, Islamic Bank, Muslim Commercial Bank, National bank to include in this survey. As representative clients of the bank, they must have a bank account in mentioned banks. They utilize a similar service, items, and administrations given by the bank. Ultimately, because of the constraint of time, it is less demanding to acquire and extricate information from the bank personnel. Therefore, this study specifically addressed the various customers of the chosen banks who also utilize online banking, particularly mobile banking.

Response Rate and Screening

The response rate of the questionnaire was not 100 % because of unreturned questionnaires. The detail of the responses is given below:

Total Population	Approximately 25000 clients (almost 5000 client per bank)
Unit of analysis	Only bank branches situated in major cities in Multan, Lahore and Faisalabad regions
Required Sample size	379 at confidence level of 95%
Successful collected sample size	380 (at response rate of 84.44%)
Sample techniques	Convenience sampling
Targeted Banks	Bank al Habib, Mezan Bank, United Bank, Islamic Bank, Muslim Commercial Bank, National bank
Reason of selection of these banks	In selected regions, citizen trust on these banking sectors, these banks facilitate all the customers with their most efficient, and effective banking services as well as they are running the Apps regarding mobile banking.

Responses	Frequency	Percentage rate
Total questionnaires	450	100%
Returned	400	88.88%
Excluded	20	4.44%
finalized questionnaires	380	84.44%

Response rate and Frequency

Data Analysis

This exploration is a cross-sectional investigation. The collected information was examined through the Statistical Package for the Social Sciences SPSS 24 software. To get the results of hypotheses, A descriptive analysis test was conducted using multiple regression models, correlation, and regression analysis tests. Furthermore, the hierarchical regression analysis was performed for mediating testing.

Reliability Test

The reliability of all constructs measured on the basis of Cronbach's Alpha. Cronbach's Alpha is considered to be greater than 0.7 (Sekaran, 2009). Additionally, the dependability of including the estimate of 0.6 is poor. The Cronbach's Alpha value is more reliable when it is near to 1.00 (Sekaran, 2009).

Descriptive Analysis

It is explained by the maximum mean value of standard deviation is 4.3898 for insecurity and the lowest value of 0.54239. It shows that insecurity is most affecting

Reliability results of the variables (Pilot Study)

Variables	No. of Items	Cronbach's alpha
OPT	4	.722
INN	4	.700
DIS	4	.814
INS	4	.809
PU	4	.810
ITUMB	4	.737

Reliability test of Variables

Note: All Cronbach's Alpha value within the limit i.e. According to Bagozzi and Yi (1988), Over and above 0.7

factor if a customer avails mobile banking facility. Whereas least value of the mean is 3.5658 and the standard deviation is high as compared to the innovation mean 4.1854 and standard deviation of 0.58425. It shows respondents want attraction and advancement. The results of perceived usefulness indicate that customer satisfaction must be significant, with a mean of 3.8174 and a standard deviation of 0.62145. The respondent finds it difficult to adjust to potential advancement.

Variables	N	Mean	St. D
OPT	360	3.8551	0.62581
INN	360	4.1854	0.58425
DIS	360	3.5658	0.61469
INS	360	4.3898	0.54259
PU	360	3.8174	0.62145
ITUMB	360	4.4415	0.64684

Descriptive Measures (N = 360)

Testing of Research Hypotheses

The relationship among the factors is analyzed by Pearson correlation (Sekaran & Bougie, 2016). The significant results are existing between -1 to +1 as While +1 indicates a good relationship, -1 indicates a weak relationship between the variables. Hence the two-tailed correlation tests and significant level 0.01 is applied.

Multiple Regression Analysis (Hypothesis Testing)

The multiple regression analysis describes the dependency of every independent

	1	2	3	4	5	6
1. ITUMB	1					
2. OPT	.412**	1				
3. INN	.532**	.321**	1			
4. DIS	.245**	.198	.331**	1		
5. INS	.287**	.080	.222**	.349**	1	
6. PU	.821**	.402**	.462**	.382**	.221*	1

factor on perceived usefulness. According to Pallant (2020) the standard coefficient analysis of the β number explains that which factor has a strong bounding with the mediator whereas the contrast of other factors and the variance shows all variables are under control.

Below table shows the independent factor's coefficient commitment towards Intention to use Mobile banking.

Model	Unstandardized Coefficient		Standardized Coefficient	T	Sig.
	β	Std. Error	β		
(Constant)	-.273	1.2414.		3.515	0.000
OPT	.121	.057	.089	2.554	0.000
INN	.148	.055	.137	2.194	0.026
DIS	-.036	.062	-.027	1.273	0.161
INS	.088	.058	.068	1.30	0.277

a. Dependent Variable: ITUMB. *Significant at .05 level.

R ²	Adjust R ²	R	F
0.614	0.609	0.783	181.827

Optimism has a standardized β value of 0.089 and shows a significant effect on a client's ITUMB. As p-value < 0.05, we accept H1. Next INN standardized β value of 0.137 gives the highest strong relationship between INN and ITUMB, with p-value < 0.026, this hypothesis (H2) is also accepted. Similarly, DIS effects a client's ITUMB with an adverse effect -.027, whose p-value > 0.05, we reject this hypothesis (H3). Finally, insecurity has the standardized β value of 0.68, which shows a weak relationship with ITUMB, as p-value > 0.277 so we reject the hypothesis (H4).

Hierarchical regression analysis: Mediation Testing

Model	Unstandardized Coefficient		Standardized Coefficient
	β	Std. Error	β
1 (Constant) Perceived Usefulness	2.458	.783	.855
	.866	.048	
(Constant)	-.254	1.2425	
Perceived Usefulness	.781	.062	.715
Optimism	.126	.055	.081
Innovativeness	.137	.052	.140
Discomfort	-.033	.068	-.024
Insecurity	.080	.059	.066

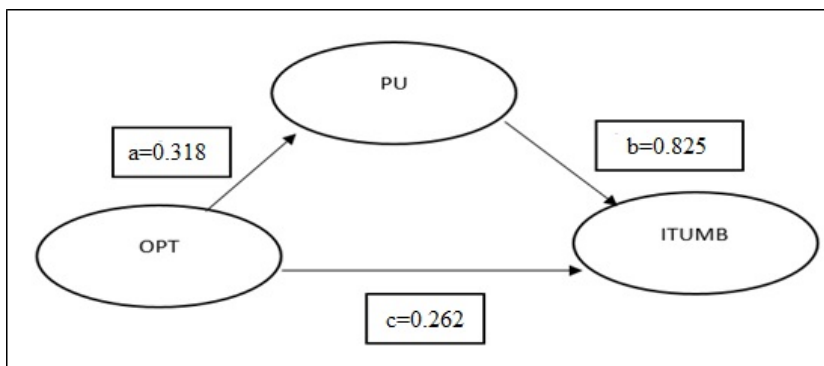
Report of Coefficients (IV with DV)a. Dependent Variable: ITUMB

Perceived usefulness (Mediator) relationship with OPT and ITUMB.

It describes the relationship between three variables Optimism (OPT), Perceived Usefulness (PU), and Intention to Use mobile banking (ITUMB) tested through regression coefficient beta.

Regression Results OPT, PU, ITUMB

Standardized Regression			
Coefficient (β)			Sig
OPT →	PU (Path a)	0.318	.000
PU →	ITUMB (Path b)	0.825	.000
OPT →	ITUMB (Path c)	0.094	.000



The above figure demonstrates the test of mediation PU effect on OPT and ITUMB. The results of the direct and indirect impact of factors are further anticipated the below calculation.

$$X=y*z$$

Whereby:

X is implicit effect or the intermediation effect (Baron & Kenny, 1986)

$y = a = \beta$ value for path a

$z = b = \beta$ value for path b

$$X = (0.318) (0.825)$$

$$X = 0.262$$

Indirect Impact value (X) is 0.262 (see in above table)

Whereas:

Immediate direct impact value of $x = 0.094$

$X = 0$ or $X > x$ (full mediation) (Baron & Kenny, 1986)

$X < x$ (halfway mediation) (Baron & Kenny, 1986)

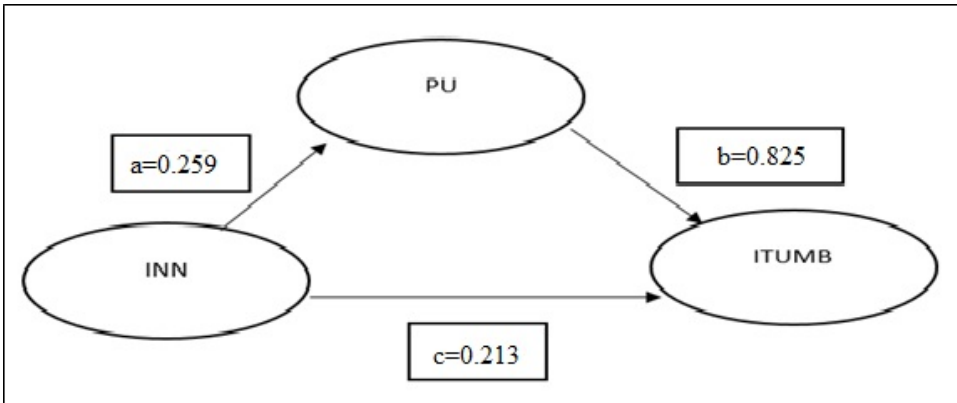
Thus, this tends to be $X > x$ which is 0.262 greater than 0.094 and ($p < .001$) that is distinguished PU as a **full mediation** of OTP and ITUMB.

PU (Mediator) relationship with INN and ITUMB

It describes the relationship between three variables innovativeness, Perceived Usefulness, and Intention to Use mobile banking tested through regression coefficient beta.

Regression Results INN, PU, ITUMB

Standardized Regression			
Coefficient (β)			Sig
INN →	PU (Path a)	0.259	.000
PU →	ITUMB (Path b)	0.825	.000
INN →	ITUMB (Path c)	0.142	.000



The above figure demonstrates the test of mediation PU effect on OTP and ITUMB. The results of the direct and indirect impact of factors are further anticipated the below calculation.

$$X=y*z$$

Whereby:

X is implicit effect or the intermediation effect (Baron & Kenny, 1986)

y = a = β value for path a

z = b = β value for path b

$$X = (0.259) (0.825)$$

$$X = 0.213$$

Indirect Impact value (X) is 0.213

Whereas:

Immediate direct impact value of x = 0.142 (see in above table)

X = 0 or X > x (Full mediation) (Baron & Kenny, 1986)

X < x (halfway mediation) (Baron & Kenny, 1986)

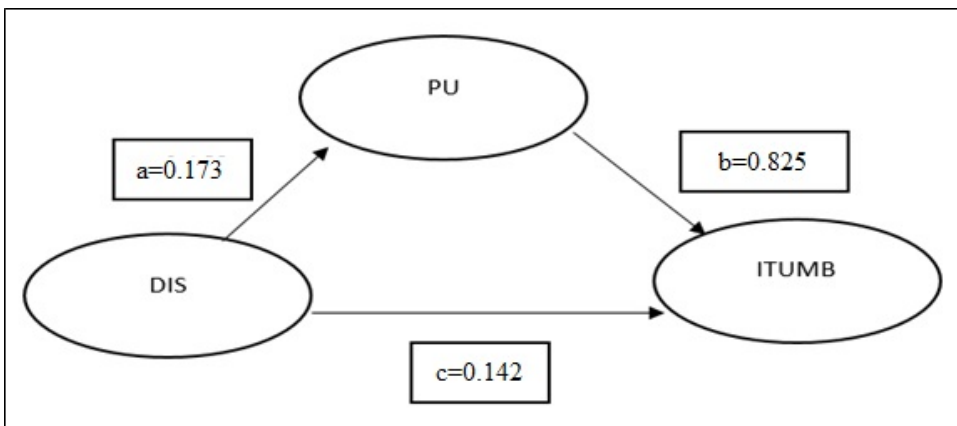
Thus, this tend to be X > x, which is 0.213 greater than 0.142 and (p<.001) that is clearly distinguished PU is a **full mediation** of INN and ITUMB.

PU (Mediator) relationship with DIS and ITUMB

It describes the relationship between three variables DIS, PU, and ITUMB tested through regression coefficient beta.

Regression Results INN, PU, ITUMB

Standardized Regression			
	Coefficient (β)		Sig
DIS →	PU (Path a)	0.173	.000
PU →	ITUMB (Path b)	0.825	.000
DIS →	ITUMB (Path c)	-0.22	.000



The above figure demonstrates the test of mediation PU effect on DIS and ITUMB. The results of direct and indirect impact of factors are further anticipated the below calculation.

$$X = y * z$$

Whereby:

X is implicit effect or the intermediation effect (Baron & Kenny, 1986)

$$y = a = \beta \text{ value for path a}$$

$$z = b = \beta \text{ value for path b}$$

$$X = (0.173) (0.825)$$

$$X = 0.142$$

Indirect Impact value (X) is 0.142

Whereas:

Immediate direct impact value of $x = -0.22$ (see in above table)

$X = 0$ or $X > x$ (full mediation) (Baron & Kenny, 1986)

$C < c$, (half mediation) (Baron & Kenny, 1986)

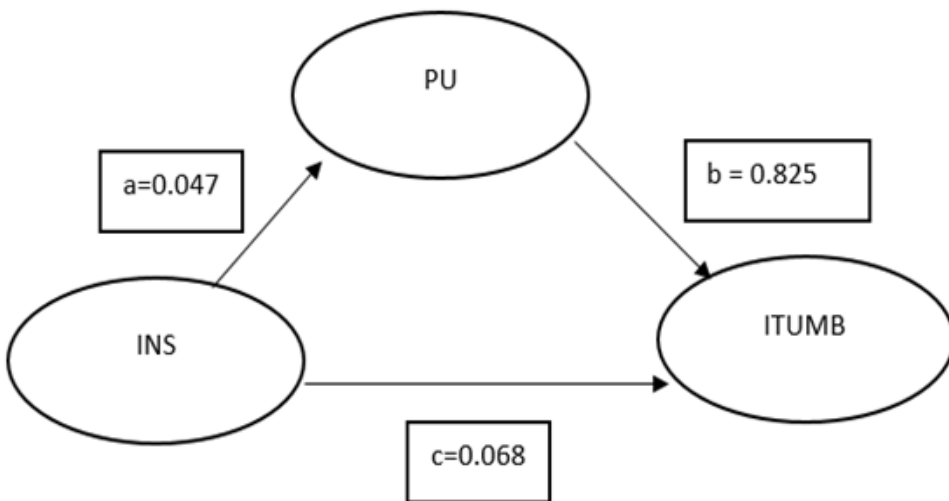
Thus, this tends to be $X > x$, which is 0.142 greater than -0.22 and ($p < .001$) that is distinguishes PU is as a **full mediation** of INN and ITUMB.

PU (Mediator) relationship with INS and ITUMB

It describes the relationship between three variables INN, PU, and ITUMB tested through regression coefficient beta.

Regression Results INN, PU, ITUMB

Standardized Regression			
	Coefficient (β)		Sig
INS →	PU (Path a)	0.052	.000
PU →	ITUMB (Path b)	0.825	.000
INS →	ITUMB (Path c)	0.073	.000



The above figure demonstrates the test of mediation PU effect on OPT and ITUMB. The results of the direct and indirect impact of factors are further anticipating through below calculation.

$X = y * z$ whereby:

X is implicit effect or the intermediation effect (Baron & Kenny, 1986)

$y = a = \beta$ value for path a

$z = b = \beta$ value for path b

$X = (0.052) (0.825)$

$X = 0.042$

Indirect Impact value (X) is 0.042

Whereas:

Immediate direct impact value of $x = 0.073$ (see in above table)

$X = 0$ or $X > x$

it implies that it is a full mediation. (Baron & Kenny, 1986)

$X < x$,

it implies that it is a halfway mediation. (Baron & Kenny, 1986)

Thus, this tends to be $C < c$, which is 0.042 less than 0.073 and ($p < .001$) that makes a difference PU is as a **partial mediation** of INN and ITUMB.

Hypothesis	Findings
H1: There is a significant relationship between OPT and ITUMB.	Accepted
H2: There is a significant relationship between INN and ITUMB.	Accepted
H3: There is a (negative) relationship of DIS with ITUMB.	Rejected
H4: There is a (negative) relationship of INS with ITUMB.	Rejected
H5: PU mediates the relationship between OPT and ITUMB.	Full mediation
H6: PU mediates the relationship between INN and ITUMB.	Full mediation
H7: PU mediates the relationship between DIS and ITUMB.	Full mediation
H8: PU mediates the relationship between INS and ITUMB	Partial mediation

Results and Discussions

Accordingly, this study used an inferential statistical analysis to infer from the sample data what the population may believe and to assess the possibility that an observed difference between groups is a true one or one that occurred by chance in this study. The association between technological readiness variables, including optimism (OPT), innovativeness (INN), discomfort (DIS), insecurity (INS), and perceived usefulness (PU) demonstrates a greater understanding of the challenges at hand. This study hypothesized that discomfort and insecurity would have a negative effect on perceived usefulness.

However, this study must reject the hypothesis because the measurable outcomes of multiple regression analysis show that discomfort and insecurity both positively affect perceived usefulness. Lin et al. (2007) defined perceived usefulness as the extent to which an individual anticipates that using a certain technology will improve his or her performance, whereas perceived ease of use indicates that using a particular technology will be simple. Lin et al. (2007) used the Pearson Correlation Analysis to measure the quality of perceived usefulness in connection to the objective of mobile banking usage. Considering the measurable outcome, perceived usefulness suggests a strong association with the objective of mobile banking usage.

The hypothesis was examined using linear regression analysis to determine whether or not perceived usefulness positively influences the propensity to use mobile banking. Because of the quantifiable result, perceived usefulness provides a significant coefficient for influencing a consumer's intent to use mobile banking (Durodolu, 2016; Daragmeh et al., 2021; Bhatt, 2021).

Conclusion

Banks in Pakistan's mobile banking services should pay close attention to the technological readiness of their consumers. When compared to online banking, mobile banking is still in its infancy in Pakistan. Therefore, further research is necessary to determine whether mobile banking is technologically suitable. This study will fill in this gap by consumer a technological readiness acceptance model with the purpose of using mobile banking in the setting of banks in Multan, Lahore and Faisalabad, Pakistan.

Because of the small targeted unit of analysis and the fact that this model relies on information from a limited number of banks, it would be interesting to replicate the study using larger number of organizations and have unique technology preparation conditions (having new innovative Information system). In larger firms, where

different responders may have differing viewpoints on their technology available, it is especially important to reflect on prior lack of knowledge in a progressive point-by-point manner.

Both the negative association between discomfort and intention to use mobile banking as well as the negative relationship between insecurity and intention to use mobile banking are hypotheses those are refuted when applied to COVID-19 circumstances. Because there is simply a connection of financial transactions that have been completed online utilizing mobile banking apps, the variable of insecurity and discomfort cannot be overcome when there is complete lockdown or partial lockdown.

Theoretical Contribution

In this study, contribution in the theoretical aspects regarding the variables of readiness, perceived usefulness, and behavior intention regarding the adaptation of services of mobile banking.

Limitations and Recommendation

The purpose of this study is to examine the desire of bank customers to use mobile banking. As a result, customers of the Bank made up the study's sample. There are many more factors that can be tested regarding customer satisfaction and self-sufficiency; just four have been highlighted. The findings of this study and the constraints those have been put in place, have a significant impact on future research plans. With a quantitative approach, the conclusions of this study could be tested further. Gathering data from various groups, confirming, and analyzing the links between the various elements that influence mobile banking acceptance would be made possible by this method. Multan is a Pakistani district where this study took place. In the future, researchers should also look at the impact and necessity of mobile banking in other parts of Pakistan.

Reference

- Angelia, A., Panjaitan, E. S., & Yunis, R. (2021). Effect of Attitude on Mobile Banking Acceptance Using Extended UTAUT Model. *Jurnal Mantik*, 5(2), 1006-1013.
- Abbas, M., Zaman, U., Ahmad, J., Nawaz, M. S., & Ahraf, M. (2019). Diffusion of mobile banking in Pakistan. *SMART Journal of Business Management Studies*, 15(1), 10-19.
- Abbas, S. K., Hassan, H. A., Asif, J., Junaid, H. M., & Zainab, F. (2018). What are the key determinants of mobile banking Adoption in Pakistan. *International Journal of Scientific & Engineering Research*, 9(2), 841-848.

- Akhtar, S., Irfan, M., Sarwar, A., & Rashid, Q. U. A. (2019). Factors influencing individuals' intention to adopt mobile banking in China and Pakistan: The moderating role of cultural values. *Journal of Public Affairs*, 19(1), 1884.
- Alalwan, A. A., Dwivedi, Y. K., & Rana, N. P. (2017). Factors influencing adoption of mobile banking by Jordanian bank customers: Extending UTAUT2 with trust. *International Journal of Information Management*, 37(3), 99-110.
- Bhatt, V. (2021). An empirical study to evaluate factors affecting customer satisfaction on the adoption of Mobile Banking Track: Financial Management. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, 12(10), 5354-5373.
- Baabdullah, A. M., Alalwan, A. A., Rana, N. P., Kizgin, H., & Patil, P. (2019). Consumer use of mobile banking (M-Banking) in Saudi Arabia: Towards an integrated model. *International Journal of Information Management*, 44, 38-52.
- Benbasat, I., & Barki, H. (2007). Quo vadis TAM?. *Journal of the association for information systems*, 8(4), 7.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, 51(6), 1173.
- Beldad, A. D., & Hegner, S. M. (2018). Expanding the technology acceptance model with the inclusion of trust, social influence, and health valuation to determine the predictors of German users' willingness to continue using a fitness app: A structural equation modeling approach. *International Journal of Human–Computer Interaction*, 34(9), 882-893.
- Chaouali, W., Souiden, N., & Ladhari, R. (2017). Explaining adoption of mobile banking with the theory of trying, general self-confidence, and cynicism. *Journal of Retailing and Consumer Services*, 35, 57-67.
- Chen, N. H. (2019). Extending a TAM–TTF model with perceptions toward telematics adoption. *Asia Pacific Journal of Marketing and Logistics*.
- Chen, J. V., Yen, D. C., & Chen, K. (2009). The acceptance and diffusion of the innovative smart phone use: A case study of a delivery service company in logistics. *Information & Management*, 46(4), 241-248.
- Cho, C. J., & Park, Y. (2016). New monitoring technologies for overhead contact line at 400 km·h⁻¹. *Engineering*, 2(3), 360-365.
- Cho, H., & Chiu, W. (2020). Sport nostalgia builds customer equity and future behavior. *Marketing Intelligence & Planning*.
- Curran, J. M., & Meuter, M. L. (2005). Self-service technology adoption: comparing three technologies. *Journal of services marketing*.
- Chiu, W., Cho, H., & Chi, C. G. (2020). Consumers' continuance intention to use fitness and health apps: an integration of the expectation–confirmation model and investment model. *Information*

Technology & People.

- Chawla, D., & Joshi, H. (2019). Consumer attitude and intention to adopt mobile wallet in India—An empirical study. *International Journal of Bank Marketing*.
- Colby, C. (2014). Technology readiness index primer.
- Choudrie, J., Junior, C. O., McKenna, B., & Richter, S. (2018). Understanding and conceptualising the adoption, use and diffusion of mobile banking in older adults: A research agenda and conceptual framework. *Journal of Business Research*, 88, 449-465.
- Daragmeh, A., Sági, J., & Zéman, Z. (2021). Continuous intention to use e-wallet in the context of the Covid-19 pandemic: Integrating the Health Belief Model (HBM) and Technology Continuous Theory (TCT). *Journal of Open Innovation: Technology, Market, and Complexity*, 7(2), 132.
- Dwivedi, Y. K., Hughes, D. L., Coombs, C., Constantiou, I., Duan, Y., Edwards, J. S., ... & Upadhyay, N. (2020). Impact of COVID-19 pandemic on information management research and practice: Transforming education, work and life. *International journal of information management*, 55, 102211..
- Damerji, H., & Salimi, A. (2021). Mediating effect of use perceptions on technology readiness and adoption of artificial intelligence in accounting. *Accounting Education*, 30(2), 107-130.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340.
- Durodolu, O. (2016). Technology Acceptance Model as a predictor of using information system 'to acquire information literacy skills. *Library Philosophy & Practice*.
- Demirci, A. E., & Ersoy, N. F. (2008). Technology readiness for innovative high-tech products: how consumers perceive and adopt new technologies. *The Business Review*, 11(1), 302-308.
- Fishbein, M., & Ajzen, I. (1977). Belief, attitude, intention, and behavior: An introduction to theory and research. *Philosophy and Rhetoric*, 10(2).
- Gummerus, J., Lipkin, M., Dube, A., & Heinonen, K. (2019). Technology in use—characterizing customer self-service devices (SSDS). *Journal of Services Marketing*.
- Geebren, A., Jabbar, A., & Luo, M. (2021). Examining the role of consumer satisfaction within mobile eco-systems: Evidence from mobile banking services. *Computers in Human Behavior*, 114, 106584.
- Ghazali, E. M., Mutum, D. S., Chong, J. H., & Nguyen, B. (2018). Do consumers want mobile commerce? A closer look at M-shopping and technology adoption in Malaysia. *Asia Pacific Journal of Marketing and Logistics*, 30(4), 1064-1086.
- Hernandez, G., Allen, J. K., Woodruff, G. W., Simpson, T. W., Bascaran, E., Avila, L. F., & Salinas, F. (2001). Robust design of families of products with production modeling and evaluation. *J. Mech. Des.*, 123(2), 183-190.

- Holden, R. J., & Karsh, B. T. (2010). The technology acceptance model: its past and its future in health care. *Journal of biomedical informatics*, 43(1), 159-172.
- Jin, C. (2013). The perspective of a revised TRAM on social capital building: The case of Facebook usage. *Information & Management*, 50(4), 162-168.
- Kaushik, A. K., & Rahman, Z. (2017). An empirical investigation of tourist's choice of service delivery options: SSTs vs service employees. *International Journal of Contemporary Hospitality Management*.
- Kiani, M. N., & Gillani, S. H. M. (2020). What Brings the Innovation in Business Model (s)? Evidence from Pakistan Mobile Banking Sector. *South Asian Journal of Management*, 14(2), 187-203.
- Kim, T., & Chiu, W. (2018). Consumer acceptance of sports wearable technology: The role of technology readiness. *International Journal of Sports Marketing and Sponsorship*.
- Kim, H., Mei, T., Byun, H., & Yao, T. (2018). Exploiting web images for video highlight detection with triplet deep ranking. *IEEE Transactions on Multimedia*, 20(9), 2415-2426.
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and psychological measurement*, 30(3), 607-610.
- Khraim, H. S., Al Shoubaki, Y. E., & Khraim, A. S. (2011). Factors affecting Jordanian consumers' adoption of mobile banking services. *International Journal of Business and Social Science*, 2(20).
- Khrais, L. T., & Shidwan, O. S. (2020). Mobile commerce and its changing use in relevant applicable areas in the face of disruptive technologies. *International Journal of Applied Engineering Research*, 15(1), 12-23.
- Kim, M. J., Lee, C. K., & Contractor, N. S. (2019). Seniors' usage of mobile social network sites: Applying theories of innovation diffusion and uses and gratifications. *Computers in Human Behavior*, 90, 60-73.
- Laukkanen, T. (2016). Consumer adoption versus rejection decisions in seemingly similar service innovations: The case of the Internet and mobile banking. *Journal of Business Research*, 69(7), 2432-2439.
- Liljander, V., Gillberg, F., Gummerus, J., & Van Riel, A. (2006). Technology readiness and the evaluation and adoption of self-service technologies. *Journal of Retailing and Consumer Services*, 13(3), 177-191.
- Lin, J. S. C., & Chang, H. C. (2011). The role of technology readiness in self-service technology acceptance. *Managing Service Quality: An International Journal*, 21(4), 424-444.
- Lin, H. F. (2011). An empirical investigation of mobile banking adoption: The effect of innovation attributes and knowledge-based trust. *International journal of information management*, 31(3), 252-260.
- Luppincini, R. (2005). A systems definition of educational technology in society. *Journal of Educational Technology & Society*, 8(3), 103-109.
- Lin, C. H., Shih, H. Y., & Sher, P. J. (2007). Integrating technology readiness into technology acceptance: The TRAM model. *Psychology & Marketing*, 24(7), 641-657.
- Meuter, M. L., Bitner, M. J., Ostrom, A. L., & Brown, S. W. (2005). Choosing among alternative

- service delivery modes: An investigation of customer trial of self-service technologies. *Journal of marketing*, 69(2), 61-83.
- Mostafa, A. A., & Eneizan, B. (2018). Factors affecting acceptance of mobile banking in developing countries. *International Journal of Academic Research in Business and Social Sciences*, 8(1), 340-351.
- Munoz-Leiva, F., Climent-Climent, S., & Liébana-Cabanillas, F. (2017). Determinants of intention to use the mobile banking apps: An extension of the classic TAM model. *Spanish journal of marketing-ESIC*, 21(1), 25-38.
- Mutahar, A. M., Daud, N. M., Ramayah, T., Isaac, O., & Aldholay, A. H. (2018). The effect of awareness and perceived risk on the technology acceptance model (TAM): mobile banking in Yemen. *International Journal of Services and Standards*, 12(2), 180-204.
- Noreen, S., Maqbool, I., & Madni, A. (2021). Dexamethasone: Therapeutic potential, risks, and future projection during COVID-19 pandemic. *European journal of pharmacology*, 894, 173854.
- Naqvi, M., Li, S., Jiang, Y., & Naqvi, M. H. A. (2019). The rise of social networking sites: an empirical investigation applying demographic differences and the technology acceptance model. *Asia Pacific Journal of Marketing and Logistics*.
- Oh, J. C., Yoon, S. J., & Chung, N. (2014). The role of technology readiness in consumers' adoption of mobile internet services between South Korea and China. *International Journal of Mobile Communications*, 12(3), 229-248.
- Oruç, Ö. E., & Tatar, Ç. (2017). An investigation of factors that affect internet banking usage based on structural equation modeling. *Computers in Human Behavior*, 66, 232-235.
- Pallant, J. (2020). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS*. Routledge.
- Payne, E. H. M., Peltier, J., & Barger, V. A. (2021). Enhancing the value co-creation process: artificial intelligence and mobile banking service platforms. *Journal of Research in Interactive Marketing*.
- Parasuraman, A. (2000). Technology Readiness Index (TRI) a multiple-item scale to measure readiness to embrace new technologies. *Journal of service research*, 2(4), 307-320.
- Parasuraman, A., & Colby, C. L. (2015). An updated and streamlined technology readiness index: TRI 2.0. *Journal of service research*, 18(1), 59-74.
- Purwanegara, M., Apriningsih, A., & Andika, F. (2014). Snapshot on Indonesia regulation in mobile internet banking users attitudes. *Procedia-Social and Behavioral Sciences*, 115, 147-155.
- Rizvi, S. K. A., Naqvi, B., & Tanveer, F. (2017). Mobile banking: A potential catalyst for financial inclusion and growth in Pakistan. *The Lahore Journal of Economics*, 22, 251-281.
- Rose, J., & Fogarty, G. J. (2010). Technology readiness and segmentation profile of mature consumers. In *Proceedings of the 4th Biennial Conference of the Academy of World Business, Marketing and Management Development* 4(1), 57-65.

- Siyal, A. W., Ding, D., & Siyal, S. (2019). M-banking barriers in Pakistan: a customer perspective of adoption and continuity intention. *Data Technologies and Applications*.
- Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill building approach*. John Wiley & sons.
- Sekaran, U. (2009). *Research Method for Business (5th ed.)*. UK: John Wiley & Sons, Ltd.
- Shahbaz, M. S., Sohu, S., Khaskhelly, F. Z., Bano, A., & Soomro, M. A. (2019). A Novel Classification of Supply Chain Risks. *Engineering, Technology & Applied Science Research*, 9(3), 4301-4305.
- Shaikh, A. A., & Karjaluooto, H. (2015). Mobile banking adoption: A literature review. *Telematics and informatics*, 32(1), 129-142.
- Shankar, A., & Jebarajakirthy, C. (2019). The influence of e-banking service quality on customer loyalty: A moderated mediation approach. *International Journal of Bank Marketing*.
- Singh, S., & Srivastava, R. K. (2020). Understanding the intention to use mobile banking by existing online banking customers: an empirical study. *Journal of Financial Services Marketing*, 25(3), 86-96.
- Venkatesh, V., Davis, F., & Morris, M. G. (2007). Dead or alive? The development, trajectory and future of technology adoption research. *Journal of the association for information systems*, 8(4), 267-286.
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management science*, 46(2), 186-204.
- Walczuch, R., Lemmink, J., & Streukens, S. (2007). The effect of service employees' technology readiness on technology acceptance. *Information & management*, 44(2), 206-215.
- Zhou, T. (2012). Examining mobile banking user adoption from the perspectives of trust and flow experience. *Information Technology and Management*, 13(1), 27-37.

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