Received: 27 April 2025 | Revised: 25 May 2025 | Accepted: 29 June 2025
DOI: 10.62460/IJEASS/2025.38

RESEARCHARTICLE

Interdisciplinary Journal of Emerging and Social Sciences

Investigation of E-Banking Products and Consumer Adoptability: A Study of the Pakistani Banking Industry

Catherine Addai Dwomoh[1] and Rabia Butt[2]

[1]Department of Management Studies Education, Akenten Appiah-Menka University of Skills Training and Entrepreneurial Development
AAMUSTED), Kumasi, Ghana.

[2]Department of Business Administration, GC Women University, Sialkot, Pakistan

Correspondence:
rabiabutt.gcwus.edu.pk@gmail.com

Abstract

The significant contribution of the study is to develop or construct a model that fulfils the perceived Performance Expectancy of customers in the context of Acceptance of E-Banking. The data was gathered through the development and testing of a questionnaire, and subsequent collection from a convenience sample. With the help of Google Docs, a survey was designed with a five-point Likert Scale. Twenty-five experts in their fields examined the study. A total of 640 unique users of m-bank applications were in total. The research hypotheses were tested by both CFA and SEM utilizing SPSS Amos version 26. The analysis outcomes established the significant influence of all the variables, alongside the considerable impact of the moderating variables except Presumed Charges. The model and research offer a banking management strategy for value-added services, which involves reprogramming Banking or E-Banking applications and advertising them to disseminate integrated information to customers. The model is suggested as an inventive extension of research on E-Banking customers. However, the investigation contributed novel knowledge and perceptions to the current frame of literature by endorsing the feasibility of the model.

KEYWORDS
Information of E-Banking; Acceptance of E-Banking; Performance expectancy; Pakistan

1 | INTRODUCTION

Unceasing developments in Information technology have led to various changes in the banking business. These transformations emphasized the improved association of consumers with digital methods for their banking requirements (Priya et al., 2018). Therefore, the usage of cell phone equipment to operate business transactions is called M-Banking (M-Banking) or E-Banking (E-Banking). It has developed as a standard banking approach (Sahoo and Sreejesh, 2017). Consumers can utilize their bank application on their cell phone or tabs for all the banking activities payment of utility, bills, transfer of currency (Tam and Oliveira, 2017; Priya et al., 2018), cheque credits, inspecting financial statements and account transactions are amongst the financial facilities used by consumers on E-Banking apps. This method of banking is a budget effective and resourceful technique of E-Banking services to customers as compared to usual service distribution networks. In recent times, there has been a significant rise in the usage of M-Banking all over the globe (Arcand et al., 2017).

E-Banking specifically for banks, supports saving operational costs (Santini et al., 2019) and acts as an extra facility network, therefore supporting them to deliver improved services for consumers (Tam and Oliveira, 2017; Parayil Iqbal et al., 2022). Moreover, delivers customized product suggestions (Sahoo and Sreejesh, 2017). Therefore, E-Banking application have been interpreted as an integral determinant for banks in consumer acquirement (Hilal and Varela-Neira 2022).

The expansion of M-Banking organization includes considerable investments (Imam et al. 2022). For that reason, sustained use of M-Banking or E-Banking by consumers has come to be an important program for banks to grow money-making revenues on these savings and uphold the long-term feasibility of the high-

tech structures (Parayil Iqbal et al., 2022). Hence, it turns out to be an important factor for banks to make sure that customer concentration in the digitalization does not decrease after the early acceptance of M-Banking (Foroughi et al., 2019). In contradiction of this background, the crucial goal line for banks must go out there to get the M-Banking application on consumers' cell phone gadgets. This moreover recommends that banking system arrangements need to emphasise the constant use of M-Banking by consumers (Shahid et al. 2022).

Therefore, this research similarly highlights that the banking system practice numerous approaches to make sure long relationships with their consistent customers (Abu-Taieh et al. 2022), an important factor of which is the preservation of a consistent link of contact between customer and bank, and providing services according to their needs and comfort (Ashraf et al., 2019). Thus, it has become an important aspect to study the character of performance expectations and their needs for making continuous use of E-Banking (Kamboj et al., 2021). To effectively reduce potential primary demands in the usage E-Banking, consumers may need some direction and more advance facilities in services (Shankar et al.. 2022). Similarly, information distribution from E-Banking empowers consumers to hold innovative technology more easily (Blut and Wang, 2020) through assisting them to practice more control towards information technology (Al Shraah et al. 2022). This control enhance customer's basic satisfaction, which is behaving positively because of intrinsic gratification instead of outside forces and incentives involved to continues use of M-Banking (Banerjee and Sreejesh 2021).

The influence of information distribution of continuous use of M-Banking remains understudied and shows a gap in the research. To cover this gap, this research offers an analysis of the E-Banking information extension of the model. The major contribution of study is to develop a model that fulfill the perceived PE of customers in the context of AEB. In the scenario, we developed a model which elaborates the significant characteristics and features of E-Banking applications from the banking side and their impact on the perception of perceived PE, and tested it in Pakistan, which gives us positive results for the model.

Therefore, this study describes the role of performance potentials by E-Banking or M-Banking from the banking industry relationship construction and relevant information sharing struggles in encouraging customers to carry on using E-Banking. Consequently, this research explains the study methodology, of data collection of 640 M-Banking users with the help of 25 experts; mainly the sample and statistics assortment procedure by using SEM analysis. Moreover, the research presents the positive outcomes of the data-analysis. This research explains the results, which emphasize the significance of bond between independent latent variables and information sharing of E-Banking procedures, facilities and their importance in dynamic consumers' behavior to remain an essential customer of M-Banking or E-Banking.

2. Literature Review

Innovative Technology Acceptance Models (TAM) and (UTAUT) Unified Theory Acceptance and Use of Technology as a method for assessing customer adoption of M-Banking technology may place excessive attention on the digitalization. Though the superiority of the technology-focused aspects might be compulsory but not adequate circumstances for sustained use of M-Banking (Banerjee and Sreejesh 2021).

E-Banking's wide-ranging apps, and alliance of Unified Theory Acceptance Use if Technology are valued in increasing consideration of technology acceptance and expanding the hypothetical limits of the research. Though the numerous research studies add to consider the value of Unified Theory Acceptance Use of Technology from diverse perspectives, there is still a requirement for an organised study and hypothesising of the significant issues that would spread over to a customer technology usage perspective. Constructed through the previous expansions to Unified Theory Acceptance Use if Technology; the purpose of effort is to increase specific consideration towards customer usage perspective and progress (UTAUT ideal endogenous expansion)**.** Innovative perspectives can find out numerous categories of significant alterations in concepts, like interpretation initially hypothesized relations to be non-substantial, altering the way of relations, changing the level of associations and generating innovative interactions. Respectively, alteration can expose the interruption of concepts that affect in the formation of creative information.

Characteristically, a concept is established through detection, which involves examining information or accumulating substantiated (or verified) theories. Further, the excessive significance of the high-tech factor of E-Banking acceptance may overlook various other aspects that may serve as a durable basis of the continuous practice of E-Banking. Previous research have unambiguously identified the significance of various aspects (Banerjee and Sreejesh 2021), like the prospective consequence of M-Banking facilities on customers identified the importance of the method. Undeniably, some researchers demand extra determinations from E-Banking to convey extra data for their customers, which can increase their awareness and interest in E-Banking facilities. In direction to safeguard customers from probable costs, some researchers contend on extra data provision by E-Bank customers. The need for banking information, which is essentially the level of service quality that banks provide to their customers, is based on the premise that

customers who have sufficient information about electronic banking features tend to be more loyal. A originates that banking info increases the concentration of consumers over the development of self-efficacy and approaches in the direction of banking service. Though literature confirmed that there is an influence from customers that they will agree to use E-Banking service if they are offered of integrated E-Banking information, and this approach of E-Banking would change to improve customers' acceptance behaviour to obtain improved performance probability of M-Banking. M-Banking qualities and its perception is the best common methods to attract E-Banking customers. It is primarily established on the practice of perceptions that are associated to the perceived features of M-Banking. Performance-expectancy has been taken from the model of UTAUT, which says more benefits from E-Banking than Manual banking, which is explained by customers' acceptance of technology and using M-Banking (Souiden et al., 2021). An effective digital transaction includes a prodigious pattern of transactions as the author Kamen writes: Penetration of an innovative Technology in the environment to affect customers' attitude is the difficult part" (Kamen, 2010; Akhlaq & Ahmed, 2015).

2.1. Theoretical framework

The Dependent determinations for the research as a durable base of sustainable uses of M-Banking are clearly specified the significance of aspects like Hypothetical Threats, Customer satisfaction, Community Effect, assumed cost, Facility excellence, perceived risk, Information of E-Banking, Recognition of E-Banking, Performance Expectancy, and demographics that are age, gender and education.

2.2. Presumed Hazards

Human errors, hazards of human derivation which can distract people's intentions; such an atmosphere or services for digital services is called a digital hazard. This type of hazard encompasses a broad spectrum of contemporary issues, including the significance of technology mishandling and business faults. As information technology becomes progressively multifaceted, technological hazards are expected to increase. The sound effects of technological misadventures on individuals may be extended long-lasting (Ghelani et al. 2022). Customers are tense, primarily because hazards are unsystematic and impulsive. Technological hazards can take along on an emergency, hazard the sustainability of a technological system, can probably cause damage of life expectancy and belongings, and can set the societal atmosphere in which risks happen (Skilodimou and Bathrellos 2021). Presumed Hazards are serious consideration when accompanying business transactions through electronic channels. Consequently, this could be one of the significant obstacles to the acceptance of E-Banking, as an individual or financial information could be exposed and used for fraudulent activities. Presumed Hazards are a risk which generates conditions, disorder, or occurrence with the probable to be a reason of financial suffering to information or system resources in the form of damage, revelation, and alteration of statistics, renunciation of facility and deception, surplus and shortage (Zhou et al. 2018). In a definite atmosphere, Presumed Hazard can be considered as electronic transaction supporting apps hazard, network Hazard risk, and Mobile Hazard risk. The Hypothetical Hazard device of M-Banking has a harmful consequence for usage (Aldammagh 2021; Ong et al. 2022). However, the maximum information about E-Banking will reduce this Hazard risk for users. This research examines the influence of Hypothetical Presumed Hazard experiments on M-Banking acceptance.

2.3. Public Motivation

Public Motivation refers to the preference that consumers and clients acquire by consuming a digital network. This is a satisfaction perception of customers which is perceived to effect customers' adoption and practice for an invention (Zhou et al., 2022). In the customer's situation, personal motivation is an influential aspect of technology acceptance and usage. When customers start to use a specific digital technology, they pay extra consideration to its innovation, information and evidence (Ashraf et al., 2018). As knowledge upsurges, customers usage of the M-Banking for decisions that are more practical (Banerjee and Sreejesh 2022).

2.4. Community Effect

Community Effect (CE) refers to an individual's observation of other people's ideas on whether they should engage in a specific conduct. Previous research on M-Banking acceptance has presented an association between CE and the objective of using M-Banking (Singh & Srivastava, 2018). CE explains the behaviours of societies where communities change and show preferences for following norms and values, reflecting the impact on individuals through the use of new technology (Tseng et al., 2018). Literature already proved that generation depends on friends, family and colleagues' suggestions when they are concerned with digital technology usage (Meet, Kala, and Al-Adwan 2022).

Therefore, this research examines whether societal impact has any consequence on clients' choice to utilise mobile banking, recommending the following hypothesis.

2.5. Presumed Charges

Presumed Charges (PC) explained as customer's thought of transactions of perceived advantage of availing services and price against availing the services (Venkatesh et al., 2012; (Tarhini et al. 2019). Moorthy et al. (2017) said that a customer acquiring a M-Banking service will be affected by the PC. A M-Banking customer will always compare PC for different banks for the same services and choose the one which provides more advantages. PC is as an individual intellectual transaction analysis, to compare the supposed advantage to the financial budget for expending a specific technological facility (Meet et al., 2022). PC is a prearranged influence on customers' technology usage. For example, in marketing studies, to observe the PC of goods or services, the cost examination is usually measured in relation to the product or service excellence (Hussain et al. 2019). In circumstances, wherever the cost value is less than the service offered, then there is a greater tendency for customers to accept an innovative technology (Merhi et al. 2020).

2.6. Perceived Risk

Perceived Risk (PR) creates obstacles and a negative perception in the mindset of customers to adopt M-Banking services (Lee and Chen 2022). Difficult languages or wording, unresolved queries, reliability of transaction methods, errors and emissions can moderate the risk in transactions of services (Manser Payne et al., 2018; Souiden et. al., 2021). Saprikis, et al. (2022) said that the results of risks are negative. They also revealed that many scholars mentioned that risk consideration is more important feature in M-Banking to evaluate results.

Perceived Risk in E-Banking has progressively captured transactions between customers and service-providing banks. The digital currency has a dual side effect, which is defined as follows: Digitalization creates costs at ease and smoothness but also makes risks that are essential to be reduced (Manser Payne et al., 2021). As specified, the association in the direction of the complete AEB, it needs more consideration than just profits. E-Banking clients who are concerned about their secrecy and safety, where customers can pay more for E-Banking products, and they are waiting to get assured that they will use appropriate, secure and risk-free service facilities. These risks are associated with capacities like secrecy, safety and right to use (Chauhan et. al, 2022). E-Banking service risk is related to the deficiency of face-to-face encounters through electronic gadgets in the digital-banking perspective (Sandhu and Arora, 2022). Shankar et al. (2022) mentioned that risk can affect the acceptance behavior of E-Banking customers through the information provided.

2.7. Facility Excellence

Facility Excellence (FE) refers to the degree to which a customer trusts that an organization has an efficient framework in place to serve them. In the context of M-Banking, there is a pressing need to acquire resources and establish a technical framework that meets the customer's needs (AlFahl, 2018; Farah et al., 2018). To fill the gap of this need, a more innovative and updated version of M-Banking services should be offered. Hence, customers could serve with the up-to-date features embedded in the services, then customers will be more likely to use these services (Tarhini et al. 2019).

FE denote the customers' declaration of the obtainability of services and sustenance methods to utilize an invention (Ong et al. 2022). It is the level of trust where customers have confidence that the technology will be presented to provide efficient services with more value addition. It has been detected that aged clients tend to face extra challenge in handling innovative or complicated info, as a consequence influencing their knowledge of innovative technologies (Nordhoff et al. 2020). Outstanding facilities have a significant impact on the usage behavior of customers therefore, in digital banking, the provision of excellent services can grab customers' attention more (Abu-Taieh et al. 2022). Various scholars agree to devote more value addition to decrease diverse tasks and difficulties to achieve their objectives. Better practices can lead to a better understanding through the technology and improved information and data arrangements to assist employer learning (Gupta and Arora 2020).

2.8. Expenditures Organization

Financial performance is calculated to measure the efficiency of resource utilization, including services offered by the banking sector to their customers, which are delivered to the end user after incurring costs to produce final goods and services. The income statement tells the true figures expended by banks to create value added services for their customers (Bani Khaled et. al., 2021). Chowdhury and Nehal (2020) said that there is a gap in research, as the effect of organizational expenditure has not been found in the literature. According to the literature, E-Banking features must be streamlined to ensure that customers experience positive outcomes. Customer's awareness has most important role to achieve the objectives of the created services. These objectives are both financial and non-financial (Ali et al., 2020; Javed et al., 2020; Nyarku & Ayekple, 2019; Bani-Khaled et al. 2021) to fascinate customers for accepting these services. Banks are doing research and developments in M-Banking to serve their customers efficiently with

more benefits and less cost, simultaneously reducing cost expenditure on creation of these services. Because the Expenditures of Organization (EO) remain an obstacle to adopting electronic M-Banking for developing countries. As this EO will be directly involved in deciding Price charges against the services, it will negatively affect low-income customers. In this scenario, the banking sector must deliver efficient M-Banking services but also customers should be informed of these services so it can help them to adopt M-Banking services. In this situation, the EO will be slightly increased. However, electronic M-Banking will be accepted more positively (Reeves and Sabharwal 2013; Nguyen 2020).

2.9. Information of E-Banking

Previous studies have empirically verified that individuals with an advanced level of field information were capable of managing analysis and data interrogations extra competently without fault and extra fast than beginners (Nisar et al. 2022). This research hypothesized that a positive relationship exists between area information and the superficial practicality of M-Banking.

Perception of M-Banking can be stated as the awareness of M-Banking customers on what they recognized about the characteristics of M-Banking services (Kamboj 2021). Jamshidi et al. (2018) discusses that obtainability of information about the services and characteristics of M-Banking and understanding revealed in the direction of these services under responsiveness standards. Literature emphasized that the accessibility of data and information would lead to the advanced possibility of acceptance intentions (Ali et al. 2020). The scope of M-Banking responsiveness be entirely determined by two main aspects: one in the data and information from the facility provider, and the next the customer's capability to search data and information about the facilities and services of M-Banking (Shankar et al., 2022; Samsudeen et al., 2022).

2.10. Acceptance of E-Banking

Acceptance of E-Banking is denoted as customers' supposed probability to use it in a particular circumstance. Data and info about the innovative method, its procedures, advanced characteristics and additional individuals' observations about this innovative method are significant matters that disturb customers' intention to adopt or not to adopt the innovative method and its usage (Ali et al. 2022; Samsudeen et al., 2022) .

Suhartanto et al. (2020) determined that the outcomes of this research revealed that the study providing an extra comprehensive description of banking customers' acceptance of E-Banking. The research proposed an opportunity for banking industry executives to upsurge the acceptance of their mobile-banking services. To raise the acceptance of mobile-banking services, the banking industry must not only offer an app that is beneficial and easy to use but also study the consumer's perception of actual demand, benefits and interest. All of their mobile-banking policies should emphasis making the availability of excellent mobile services while guaranteeing the banking industry procedures are accommodating with the clients circulating information about the services (Kamboj 2021).

Roy and Das (2018) believed that studying the consciousness or data and acceptance level of individuals in the countryside and city towards E-Banking Services before and after the demonetization period is important. This research suggests that banks and service providers should organise diverse operations and conduct preparation that might encourage individuals to adopt M-Banking. It is leading to the statement that Acceptance of E-Banking will influence M-Banking usage intention.

2.11. Performance Expectancy

According to Venkatesh et al. (2012), performance expectancy refers to the level to which individuals adopt a specific behaviour as a result of encouragement from others to adopt a particular conduct. This concept is particularly relevant for individuals who believe that the outcomes of M-Banking will enable them to achieve profitable accomplishments, provided they invest time and effort. Though developed nations like China are aware of the invention of M-Banking, it is quite innovative to several technology customers, particularly when mobile app features are recommended repeatedly (Tarhini et al. 2019). Performance expectancy is connected with customers' opinions about the effectiveness of the technology to perform altered tasks competently (Venkatesh et al., 2003; Ain et al., 2016). Literature has well-defined previous performance expectancy as the level to which customer considers that, by means of an information structure, such as mobile E-Banking, they will benefit from accomplishing improvements in work performance. Previous literature (Riffai et al., 2012; Oliveira et al., 2014) has indicated that performance expectancy is a dynamic factor preceding customers' adoption of M-Banking technology (Shaikh et al., 2018). In the E-Banking perspective, performance-expectancy reproduces the customer's awareness of performance enhancements, such as suitable transaction possibilities, quick response and service efficiency (Zhou et al., 2010). From the perspective of E-Banking, performance-expectancy refers to the level

of confidence customers have in using E-Banking, which can support them in earning an income or generating cash while utilising M-Banking (Sharma et al., 2020).

Three models, including UTAUT, TAM, and TPB, provide the basis for the proposed model depicted in Fig 1; they are then supplemented by service quality and four moderating elements. The model incorporates the UTAUT-derived PH, PM, CE, and PC structures. The TAM and TPB frameworks informed the adoption of two additional concepts: Expenditures Organization (EO) and the Theory of Elasticity and the Theory of Predictive Reasoning (EO). Information of E-banking (IEB) is influenced by seven constructs/independent variables, which, in turn, affect the Acceptance of E-banking (AEB), which, in turn, affects Performance Expectation (PE). Thirty-seven studies were used to create the suggested model and hypotheses.

The study used TAM and TPB-related theories to support the UTAUT-related ideas in the literature. Finally, the study explores and tests the moderating factors' and service quality-related hypotheses.

2.12. Hypotheses using Unified Theory of Acceptance and Use of Technology (UTAUT)

H_{01}: Presumed Hazard (PH) encourages users to adopt m-banking services by favorably influencing their Information E-banking (IEB).

H_{02}: Public motivation (PM) impacts consumers' Information of E-banking (IEB) usage of M-Banking services in a good way.

H_{03}: Community effect (CE) has a favourable impact on consumers' decisions to utilise m-banking services by influencing their information E-banking (IEB).

H_{04}: Presumed charges (PC) negatively influences the Information of E-banking (IEB) of customers to use m-banking services.

H_{05}: Clients' decisions to use M-Banking services are positively affected by their perceived risk (PR).

H_{06}: Facility-Excellence (FC) encourages users to adopt m-banking services by favorably influencing their Information E-banking (IEB).

H_{07}: The Information of E-Banking (IEB) of clients is favorably influenced by the Expenditures Organization (EO) to utilise m-banking services.

H_{08}: Acceptance of E-banking (AEB) is favorably influenced by knowledge of E-banking (IEB) among users of M-Banking.

H_{09}: Acceptance of E-banking (AEB) positively influences perceived Performance expectancy (PE) of m-bank application.

3 MATERIALS AND METHODS

3.1. Instrument development

The model for the research contains Nine latent variables and which are measured with multiple items. A scale was developed with these items to prove the assumptions made for the research study for E-Banking in Pakistan.

Research aims to examine the level of performance expectation (PE) that Pakistani users have for m-banking services. Due to a lack of prior studies, our team constructed the model depicted in Fig 1 and hypothesized the results. The data was gathered through the development and testing of a questionnaire, and subsequent collection from a convenience sample (Mostafa 2020). The survey design and technique of the research will be explained in depth in the following three sections (research background, measuring items, and participants and process). With the help of Google documents (Ali et al. 2022), a survey was designed with a five-point Likert Scale (Yaseen et al., 2018; Bubou and Job 2022) ranging from "strongly disagree" (1) to "strongly agree" (5) in both Urdu and English (5). Twenty-five experts in their fields examined the survey. We considered your suggestions and updated the survey as a result. As a result, 41 m-bank customers in Pakistan participated in a trial of the survey to ensure

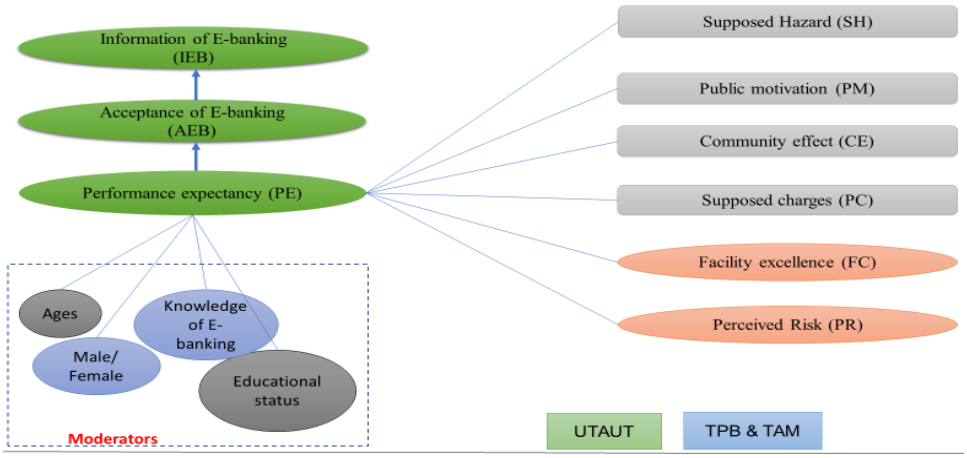

Fig. 1: Framework of the performance expectancy of M-Banking.

the questions could be understood. Some changes were made to the survey. The poll link was shared across the most prominent social media platforms in Pakistan, including Facebook, LinkedIn, and WhatsApp groups comprising students, researchers, and country natives. Data from Morgan Tables suggests that a sample size of 1120 application users is ideal for doing this study. The study was conducted from January 1, 2021, to February 20, 2021. After excluding incomplete responses, Table 1 reveals a total of 640 unique users of m-bank applications.

3.2. Research Models

The study used structural equation model (SEM), UTAUT, TAM, and TPB models. Machine learning validation (ML) was then utilised to determine the impact of moderating factors and form the basis of the proposed model depicted in Fig 1. The UTAUT model incorporates the PH, PM, CE, and PC structures. The TAM and TPB frameworks informed the adoption of two additional concepts. Expenditures Organization (EO) and the Theory of Elasticity and the Theory of Predictive Reasoning. While the outcomes and hypotheses were evaluated by SEM and CFA (Rigdon, Sarstedt, and Ringle 2017), ML verified the data and predicted the r-squared and p-value.

3.3. Descriptive Analysis

The average value of the information being measured, while the standard deviation provides an indicator of the data's variability and the results are shown in Table 2.

According to the data, all study variables are used in major Measurements, and respondents' PR traits actually exist to a lesser or greater extent. The average, standard deviation, measurement, and direction scores for each item are displayed in Table 3.

3.4. SEM Analysis

SEM analysis was utilized in the study to check the hypotheses. The research hypotheses were tested by both CFA and SEM utilizing SPSS Amos version-26. The properties of the instruments were checked using CFA. AVE, composite reliability, Cronbach's alpha, and factor loadings are displayed in Table 4. The estimation model verifies the reactions of noticed factors to dormant factors and indicates how idle factors or speculative builds are judged in relation to detectable factors. In addition, since every AVE value was more, and convergent validity could be demonstrated.

Discriminant validity can be seen in Table 5 as all of the intercorrelations between pairs of constructs are less than the square root of the AVE estimations of the two constructs. The results of the measurements proved that adequate convergent and discriminant measures.

3.5. Structural Equation Modeling (SEM)

Indirect effects can be tested alongside their direct counterparts using SEM. CE, PH, PM, PR, FE, and EO are favorably impacted as shown in Table 6. The hypotheses H_{01}, H_{02}, H_{03}, H_{05}, H_{06}, and H_{07} were all accepted, whereas H_{04} was rejected because enabling conditions did not affect IEB. IEB also has a positive and considerable effect on AEB, and AEB has an effect on PE, hence H08 and H09 are correct. Coefficients of determination R^2 for the intrinsic variables of IEB, AEB, and PE confirmed that the model well describes the observed variance. An overview of the assumptions that were put to the test is provided in Table 6.

The model's coefficient values are depicted in Fig 2. Based on these structures, one may deduce the following: When it comes to the profitability of M-Banking apps, the AEB is the most influential factor.

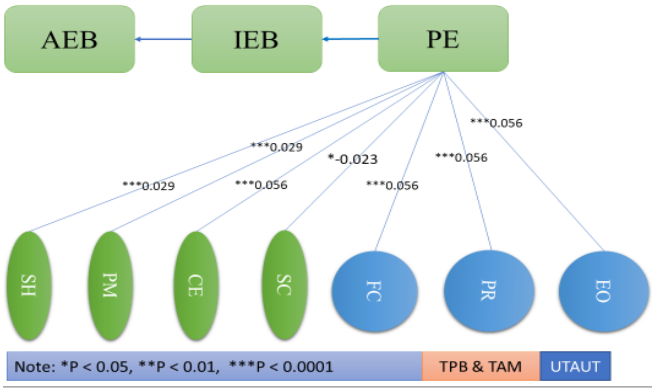

Fig. 2: The proposed model and the derived coefficient values

As a result, IEB has the second-highest coefficient value. As a result, IEB has the most significant impact on AEB. The effects of TE on IEB is the third largest coefficient value, with PE coming in at the fourth highest. IEB is affected by the fifth coefficient value, EO, and PM, and CE are responsible for the sixth and seventh coefficient values. values, respectively. Using the coefficient value, the negative impact of PR is clear but not overwhelming, while the impact of PC is the lowest.

3.6. Moderating Impacts

Separate Trials We used a t-test (Bubou and Job 2022) to see if there were any significant gender disparities in respondents' plans to act. In addition, an analysis of variance (ANOVA) (Shin et al., 2020) was used to identify statistically significant differences in respondents' behavior intentions by gender, age, level of education, and time spent online. Table 7 displays t-test findings indicating a gender- based difference in IEB, with males showing the greater difference.

Table 1: Demographics of the respondents

Group	Type	Regularity	Proportion (%)
Gender	Male	475	74.22
	Female	165	25.78
	Total	640	100
Age (year)	20 to less than 28	365	57.03
	28 to less than 36	123	19.42
	36 to less than 44	60	9.37
	44 to less than 52	72	11.25
	52 and over	20	3.13
	Total	640	100
Education Measurement	Matric	42	6.4
	Intermediate	85	13.28
	Undergraduate	430	67.19
	Graduate	90	14.07
	Total	640	100
Internet experience	Moderate	46	7.19
	Satisfactory	225	35.16
	Outstanding	369	57.66
	Total	640	100

Table 2: Summative mean and dispersion statistics for the study's variables

Variable Details	Variables	$\bar{X}$	St-Dev.	Measurement	Direction
Independent variables	Presumed Hazard (PH)	5.0147	0.8351	High	2
	Public motivation (PM)	5.0041	0.8456	High	4
	Community effect (CE)	4.0047	0.9784	High	7
	Presumed charges (PC)	5.0145	0.8794	High	3
	Facility excellence (FC)	4.0784	2.0871	Moderate	8
	Perceived Risk (PR)	5.0179	0.9864	high	3
	Expenditures Organization (EO)	4.1205	0.9642	High	4
Mediating variable	Information of E-banking (IEB)	5.0141	0.9765	high	3
	Acceptance of E-banking (AEB)	4.0256	0.9747	High	2
Dependent variable	Performance expectancy (PE)	4.0975	0.9456	High	…

Table 3a: Variable means and standard deviations

Presume Hazard (PH)	Mean	St. Dev.	Measurement	Direction
SH1	5.01	0.844	High	2
SH2	5.01	0.842	High	4
SH3	5.02	0.827	High	2
SH4	4.02	1.022	High	4
Public motivation (PM)				
PM1	5.02	0.844	High	2
PM2	4.01	0.799	high	4
PM3	4.56	0.802	high	4
PM4	4.97	1.02	high	2
Community effect (CE)				
CE1	5.09	0.724	High	2
CE2	4.29	0.746	High	4
CE3	5.09	0.744	High	2
Presumed charges (PC)				
PC1	5.01	0.84	High	2
PC2	5.22	0.291	High	2
PC3	5.09	0.846	High	4
PC4	5.23	0.704	High	4
Facility excellence (FE)				
FE1	4.99	2.26	Moderate	2
FE2	5.02	2.264	Moderate	4
FE3	4.97	2.264	Moderate	4
FE4	5.07	2.229	Moderate	2

Table 3b: Variable means and standard deviations

Perceived Risk (PR)	Mean	St-Dev.	Measurement	Direction
PR1	5.23	0.764	high	3
PR2	3.98	0.724	high	4
PR3	5.31	0.902	highest	2
PR4	3.97	0.706	high	2
Expenditures Organization (EO)				
EO1	4.7	0.298	High	2
EO2	5.01	0.294	High	2
EO3	4.86	0.707	High	4
Information of E-banking (IEB)				
IEB1	4.97	0.864	Very high	2
IEB2	5.027	0.866	High	2
IEB3	4.04	0.767	High	4
Acceptance of E-banking (AEB)				
AEB1	4.29	0.726	High	4
AEB2	4.74	0.702	High	4
AEB3	5.23	0.291	High	2
AEB4	4.01	1.026	High	2
Performance expectancy (PE)				
PE1	4.04	0.848	High	2
PE2	5.23	1.02	High	4
PE3	5.23	0.704	High	4
PE4	5.01	0.729	High	6
PE5	4.06	0.297	High	2
PE6	4.02	1.022	High	4

Table 4a: The final measuring model's results

Variables	FL	SD	SMC	EV	Cronbach Alpha	Composite Reliability	AVE**
Presumed Hazard (PH)					0.586	0.77	0.57
PH1	0.59	***	0.846	0.208			
PH2	0.67	0.044	0.645	0.0224			
PH3	0.67	0.06	0.57	0.084			
PH4	0.84	0.042	0.688	0.246			
Public motivation (PM)					0.67	0.77	0.77
PM1	0.645	***	0.57	0.264			
PM2	0.64	0.247	0.594	0.22			
PM3	0.598	0.247	0.574	0.088			
PM4	0.576	0.247	0.1986	0.26			
Community effect (CE)					0.586	0.77	0.57
CE1	0.586	***	0.695	0.202			
CE2	0.842	0.028	0.778	0.226			
CE3	0.592	0.04	0.842	0.246			
Presumed charges (PC)					0.59	0.84	0.77
PC1	0.592	***	0.598	0.22			
PC2	0.596	0.028	0.695	0.22			
PC3	0.594	0.044	0.842	0.226			
PC4	0.59	0.048	0.628	0.484			
Facility excellence (FE)					0.778	0.84	0.77
FE1	0.842	***	0.778	0.259			
FE2	0.774	0.042	0.64	0.198			
FE3	0.596	0.042	0.778	0.259			
FE4	0.645	0.046	0.695	0.442			

Table 8 shows the results of a comparison test, which reveals a truly enormous difference in respondents' IEB after accounting for age, education, and time spent online.

The importance of the age variances among separate groups is shown in Table 9. Table 2 shows that the five groups (20-29, 30-36, 36-44, 44-52, and 52+) differ significantly from one another, with the mean difference being significant at the 0.05 level of significance.

The statistical significance of the variations in levels of education between each pair of groups is shown in Table 10. Matriculation, Intermediate, Undergraduate, and Graduate levels were statistically distinct from one

Table 4b: The final measuring model's results

Expenditures Organization (EO)					0.548	0.79	0.82
EO1	0.603	***	0.567	0.302			
EO2	0.647	0.304	0.532	0.034			
EO3	0.549	0.052	0.604	0.087			
Perceived Risk (PR)					0.589	0.75	0.64
PR1	0.576	***	0.1986	0.208			
PR2	0.778	0.046	0.59	0.066			
PR3	0.695	0.247	0.574	0.088			
Information of E-banking (IEB)					0.598	0.84	0.84
IEB1	0.592	***	0.598	0.228			
IEB2	0.598	0.042	0.695	0.084			
IEB3	0.574	0.04	0.1982	0.198			
Acceptance of E-banking (AEB)					0.778	0.77	0.57
AEB1	0.695	***	0.576	0.284			
AEB2	0.842	0.044	0.778	0.206			
AEB3	0.846	0.042	0.695	0.247			
AEB4	0.596	0.044	0.776	0.222			
Performance expectancy (PE)					0.754	0.79	0.
PE1	0.509	***	0.632	0.201			
PE2	0.845	0.057	0.745	0.223			
PE3	0.874	0.031	0.622	0.079			
PE4	0.841	0.045	0.609	0.341			

Note: *, **, *** shows the p-value of 0.1, 0.05 and 0.001.

Table 5: Results of inter-correlations of all the variables

Variables	SH	PM	CE	PC	EO	TE	PR	IEB	AEB	PE
SH	0.82									
PM	0.73	0.84								
CE	0.91	0.51	0.93							
PC	0.91	0.73	0.58	0.91						
EO	0.09	0.03	0.07	0.07	0.78					
FE	0.73	0.71	0.53	0.71	0.11	0.92				
PR	0.72	0.57	0.72	0.58	0.03	0.58	0.93			
IEB	0.86	0.91	0.58	0.73	0.31	0.75	0.72	0.91		
AEB	0.75	0.73	0.57	0.77	0.06	0.57	0.74	0.71	0.88	
PE	0.75	0.73	0.58	0.86	0.12	0.73	0.53	0.69	0.91	0.84

Note: The diagonal components are the square roots of the component-wise average variances.

Table 6: Summarized version of the theoretical model's forecast outcomes

Exploration Projected Pathways		Coeff. V	t-v	p-v	Efficient mark
H_{01}: SH	⟶ PE	0.1250	7.4282	0.0001	Valid
H_{02}: PM	⟶ PE	0.2481	3.1510	0.0010	Valid
H_{03}: CE	⟶ PE	0.0486	1.5173	0.0090	Valid
H_{04}: PC	⟶ PE	0.0467	1.3104	0.1090	Not-Valid
H_{05}: PR	⟶ PE	-0.0919	-1.1845	0.0150	Valid
H_{06}: FE	⟶ PE	0.4284	17.751	0.0001	Valid
H_{07}: EO	⟶ PE	0.1136	3.5010	0.0000	Valid
H_{08}: PE	⟶ IEB	0.4855	13.328	0.0005	Valid
H_{09}: IEB	⟶ AEB	0.8013	40.231	0.0002	Valid

Table 7: The t-test of respondents' gendered behavior intentions results

Variable	Male			Female			t-value	diff.	Significance
	SD	$\bar{X}$	No. of Males	SD	$\bar{X}$	No. of Female			
Behavioral	1.025	5.003	475	1.0124	5.287	165	3.058	427.03	0.05

another at the $p < 0.05$ level of significance, the mean difference is noticeable.

The statistical significance of the variations in Internet use across the four groups is shown in Table 11. There was a significant statistical gap between the middle and top groups, as well as between the bottom and top groups. At the 0.05 level of significance, the mean difference is noticeable.

3.7. Artificial Intelligence Validation and Prediction

We evaluate five different machine learning (ML) characterization models, and how ML order methods may be used to map inputs to desired outputs through a structured set of variations. Those five models are the REF Tree Model, and the Arbitrary Woods, the Straight

Table 8: ANOVA Analysis of moderating variables variance

Variable		Sum of Squares	Df	Mean Square	F	Sig.
PE attributed to age.	Among sets	13.568	5	4.025	5.024	0.005
	Inside sets	302.517	417.05	0.784		
	Total	328.423	520			
PE attributed to educational Measurement.	Among sets	11.058	4	4.078	5.268	0.005
	Inside sets	294.12	412	0.741		
	Total	328.423	520			
PE attributed to Internet experience.	Among sets	9.08	3	5.028	7.021	0.005
	Inside sets	286.35	398	0.742		
	Total	328.423	520			

Table 9: Age-related differences in behavioral intent with a multiple-comparisons

Age		Mean			95% Confidence Interval	
	(j) Age	Dif. (i-j)	Std. Error	Sig.	Moderator Bound	Upper Bound
20 to less than 28	28 to less than 36	-0.3102	0.25478	0.098	-0.6248	0.0856
	36 to less than 44	-0.3014	0.22345	0.756	-0.6014	0.2045
	44 to less than 52	−0.5712	0.23684	0.702	-0.7233	0.2145
	52 and over	1.025 1*	0.32124	0.057	0.0528	2.0251
28 to less than 36	20 to less than 28	0.30145	0.23554	2.038	-7.0235	0.6542
	36 to less than 44	0.08452	0.22145	1.025	-0.4682	0.6287
	44 to less than 52	-0.03551	0.20148	2.033	-0.8649	0.5487
	52 and over	2.0045*	0.58974	0.001	0.36874	3.0269
36 to less than 44	20 to less than 28	0.32589	0.26589	0.789	-2.0645	0.4999
	28 to less than 36	-0.090124	0.35891	1.023	-0.62341	0.4887
	44 to less than 52	-0.128991	0.23554	1.045	-2.00568	0.5789
	52 and over	2.0358*	0.48971	0.078	0.23545	3.0289
44 to less than 52	20 to less than 28	0.56897	0.23899	0.356	-0.8985	0.7452
	28 to less than 36	0.057554	0.23558	2.031	-0.5789	0.6258
	36 to less than 44	0.20357	0.35456	1.011	-0.5023	0.2148
	52 and over	2.01478*	0.54566	0.023	0.6842	3.0244
52 and over	20 to less than 28	-1.02583*	0.30256	0.023	-2.0891	-0.4587
	28 to less than 36	-2.0089*	0.58999	0.023	-3.0089	-0.4587
	36 to less than 44	-2.0146*	0.47802	0.042	-3.0125	-0.7856
	44 to less than 52	-2.0048*	0.40283	0.001	-3.0589	-0.8456

Note: significance level is shown by '*' and $p < 0.05$.

Table 10: Education related behavioral intention comparisons

Edu. Measurement (i)	Edu. Measurement (j)	Dif. (i-j)	Std. Er	Signif.	95% confidence interval Moderator Bound	Upper Bound
Matriculation	Matriculation	-0.9246	0.5124	0.005	-2.0052	-0.30256
	Undergraduate	-0.72354	0.33546	0.005	-2.03146	-0.2471
	Graduate	-0.7405	0.3158	0.005	-0.038	-0.06487
Intermediate	Matriculation	0.92468	0.52146	0.005	0.3215	2.5124
	Undergraduate	0.5246	0.005	0.3298	2.0842	0.6248
	Graduate	0.32547	0.21354	0.4551	-0.2102	0.6241
Undergraduate	Matriculation	0.23481	0.21563	0.9312	-0.4565	0.7458
	Undergraduate	0.7124	0.3145	0.009	0.3245	2.0487
	Graduate	-0.32547	0.23549	0.4156	-0.6246	0.2351
Graduate	Matriculation	-0.0684	0.2146	1.0356	-0.5127	0.3216
	Undergraduate	0.76423	0.3189	0.0468	0.04235	2.0356
	Graduate	-0.21655	0.23568	0.9542	-0.7124	0.4687

Table 11: Multiple comparisons analysis of the behavioral intention attributed to Internet experience.

(i) Internet Knowledge	(j) Internet Knowledge	Mean Difference (I–J)	Std. Error	Sig.	95% Self-assurance Interval Lowest Bound	Higher Bound
Moderate	Satisfactory	-3.2891	0.3105	0.568	-0.8546	0.3265
	Outstanding	-0.57841	0.0451	-1.0325	-1.2245	-0.0318
Satisfactory	Moderate	0.32597	0.2351	0.5891	-0.3258	0.9542
	Outstanding	-0.35898	0.0071	-0.005	-0.6289	-0.0628
Outstanding	Moderate	0.57844	0.0521	0.0413	1.0214	1.2358
	Outstanding	0.25641	0.0555	0.001	0.0658	0.9564

$P < 0.05$

Regression, the Artificial Neural Network (ANN), Consecutive Minimal Streamlining Calculation for Support Vector Machine (SMO), the Packing with the. By recalculating the threshold for statistical significance, the SVM model's weighted vectors are updated via the SMO process. Several REF Tree models are constructed from a sample of the events and elements in the training set, and the final predicted value is the mean of the tree distributions. The irregular forest is a model of decision trees (DT) that is built on an ad hoc approach to inspecting and arranging key data and features. The model's output is the distribution of DT tree values. In this analysis, we examine the willingness of customers to use the m-banking system. In any event, the ML subfield provides techniques for building models with varying topologies, each of which, in the context of an order notion, links independent and dependent elements. The review validates three models: one describing the influence of UTAUT, Hat, and TPB components on the dependent variable BI; another relating the independent variable IEB to the AEB; and a third relating the AEB component to the PE variable. In Fig 3, the results of five ML computations are shown on three models. X-tomahawks represent models, while y-tomahawks display their R2 and MSE. The R^2 value indicates the extent to which diversity is the dependent variable resulting from the independent characteristics.

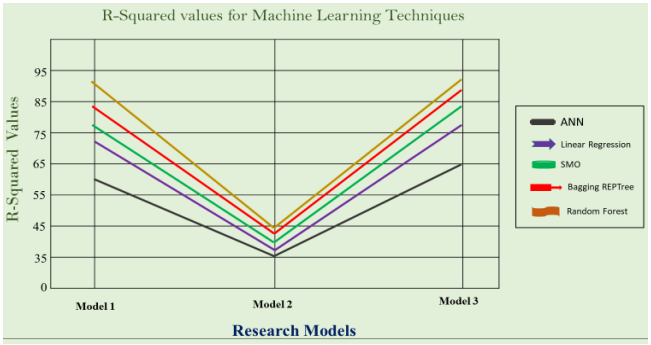

Fig. 3: Machine learning techniques R^2.

The MSE measures the average discrepancy between the modelled and observed benefits. Fig 3 shows that when comparing the R^2 values of the three models, the objective characteristics, the direct relapse, and the SMO, the ML models produce more reasonable results.

This demonstrates that the created models' straight coefficients have a stronger relationship to the objective labels. Model 1 uses direct regression and SMO models to predict the IEB variable from the independent variables using a positive coefficient for each independent variable relative to the dependent variable. Because of the robust relationship between the two components, ML models may infer the PE variable from the AEB variable. Fig 4 also ensures the success of the SMO model, which achieves a small MSE value between the desired and actual benefits.

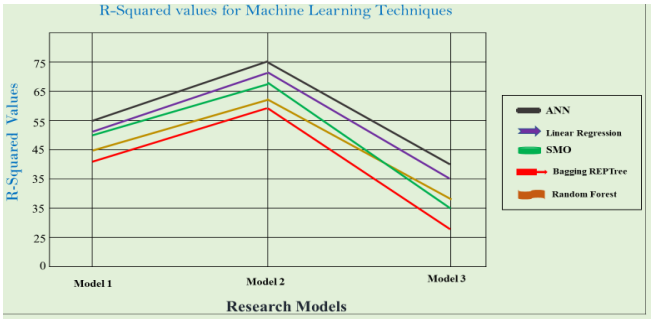

Fig. 4: Mean Squared Error of ML techniques.

4 | DISCUSSION

This research investigation contribution to the E-Banking literature. The study was conducted as a customer-oriented perception. The model is based on UTAUT, TAM, and TPB models, which are already relevant to the Technology acceptance behaviour of consumers. These models were tested many times for E-Banking customers in various region of the world to measure the acceptance behavior of consumers (Abu-Taieh et al. 2022). The extension of related variables can contribute to the rational understanding of essential phenomena. Therefore, the current study was conducted to measure the Perceived Performance Expectancy of customers after Acceptance of E-Banking Technology, while facilitated by valuable information. Perceived PE and AEB have found a significant relationship in the study. The higher amount of perceived PE predicted by the customer's AEB. The study found higher PE expectations after AEB.

5. Conclusion

Consumers accustomed to traditional banking systems often experience insecurities when using E-Banking, which can be mitigated by updating services with a focus on continuous improvement. E-Banking services offer no human dealings, which customers perceive as high Risk and uncertainty. A motivation arises when the customer perceives that they have access to value-added E-Banking services, which can be delivered through the focus strategies of banks. For strategic makers, the research outcomes suggest focusing on the importance of information and collaboration with customers, which ultimately creates a more customer-favorable environment and a win-win situation.

AEB is the milestone for the banking sector to achieve its potential and active customers in the current digital era. For this purpose, customers must be well-informed about the services offered by E-banking services. To understand the phenomenon, a model in

the study was developed, which reflected the customer's intimacy with E-Banking and M-Banking on the basis of the factors. The results of the survey indicate that us understand the behavior pattern that customers with more information about E-banking will accept E-banking services more quickly. This is the key point for banks to extend their market share by attracting more customers through disseminating E-banking services information in the market. Banks should evaluate and execute their strategies to their target customers of the market.

The model not only helps develop the infrastructure of E-Banking services but also suggests that banking management open collaboration ways between banks and their customers. This allows customers to access relevant and futuristic information about E-banking services, while E-Banking management can receive valuable feedback for future value-added services. The customers can be encouraged, fascinated and motivated towards E-Banking, when they feel secure, entertained well and happy to use E-banking activities. In this context, enhancing E-banking services and infrastructure quality is crucial. This should be followed by disseminating the improved services to end consumers, aiming to meet their performance expectancy targets, which are closely tied to the acceptance of E-Banking. Moreover, the study explained how a number of individual features, that is, age, knowledge of E-Banking, gender, and experience, together moderate the effect on AEB.

6. Limitations

As the research was conducted in Pakistan, where the technology of M-Banking and E-Banking services shows an emerging and moderate level of penetration rate of customers, the outcome findings might differ from those in other countries. The study focused on E-Banking services that could be integrated into the overall digital banking system. As mentioned, customers make their decisions based on the information provided to them. Future studies might be conducted to test in different countries, and also with different moderating variables. Further addition of more latent variables to the model might help increase the implementation of the model in research studies. As recommended, the ratio of AEB and the market share of E-Banking customers can be increased further by providing integrated services in real-time, with maximum available facilities, a reliable, secure platform and relevant information by educating customers, such as tutorials for using E-Banking services. E-Banking services should be integrated with other applications to assess their effectiveness. For example, other social media applications linkage, E-mail backup and double authorization options for their customers.

7. Abbreviations

Theory of Planned Behavior = TPB
The Unified Theory of Acceptance and Use of Technology = UTAUT
The Technology Acceptance Model = TAM
Structural Equation Modeling = SME
Confirmatory Factor Analysis = CFA
Machine Learning = ML
Artificial Neural Network = ANN
Support Vector Machine = SMO
Bagging Reduced Error Pruning Tree = RepTree

REFERENCES

Abu-Taieh, E. M., AlHadid, I., Abu-Tayeh, S., Masa'deh, R. E., Alkhawaldeh, R. S., Khwaldeh, S., & Alrowwad, A. A. (2022). Continued intention to use of M-Banking in Jordan by integrating UTAUT, TPB, TAM and service quality with ML. Journal of Open Innovation: Technology, Market, and Complexity, 8(3), 120.

Ain, N., Kaur, K., & Waheed, M. (2016). The influence of learning value on learning management system use: An extension of UTAUT2. Information Development, 32(5), 1306-1321.

Akhlaq, A., & Ahmed, E. (2015). Digital commerce in emerging economies: Factors associated with online shopping intentions in Pakistan. International Journal of Emerging Markets.

Aldammagh, Z., Abdeljawad, R., & Obaid, T. (2021). Predicting M-Banking adoption: An integration of TAM and TPB with trust and perceived risk. Financial Internet Quarterly, 17(3), 35-46.

AlFahl, H. (2018), "Mobile commerce adoption",in Mobile Commerce: Concepts, Methodologies, Tools, and Applications, IGI Global, PA, pp. 820-848.

Ali, A., Hameed, A., Moin, M. F., & Khan, N. A. (2022). Exploring factors affecting mobile-banking app adoption: a perspective from adaptive structuration theory. Aslib Journal of Information Management.

Ali, S., Poulova, P., Yasmin, F., Danish, M., Akhtar, W., & Javed, H. M. U. (2020). How big data analytics boosts organizational performance: the mediating role of the sustainable product development. Journal of Open Innovation: Technology, Market, and Complexity, 6(4), 190.

Al Shraah, A., Abu-Rumman, A., Al Madi, F., Alhammad, F. A. F., & AlJboor, A. A. (2022). The impact of quality management practices on knowledge management processes: a study of a social security corporation in Jordan. The TQM Journal, 34(4), 605-626.

Arcand, M., PromTep, S., Brun, I., & Rajaobelina, L. (2017). M-Banking service quality and customer relationships. International Journal of Bank Marketing. Jebarajakirthy, C., & Shankar, A. (2021). Impact of online convenience on M-Banking adoption intention: A moderated mediation approach. Journal of Retailing and Consumer Services, 58, 102323.

Banerjee, S., & Sreejesh, S. (2022). Examining the role of customers' intrinsic motivation on continued usage of M-Banking: a relational approach. International Journal of Bank Marketing, 40(1), 87-109.

Bani-Khaled, S. M., EL-DALABEEH, A. R. K., AL-OLIMAT, N. H., & AL SHBAIL, M. O. (2021). Relationship between corporate social responsibility expenditures and performance in Jordanian commercial banks. The Journal of Asian Finance, Economics and Business, 8(3), 539-549.

Blut, M., & Wang, C. (2020). Technology readiness: a meta-analysis of conceptualizations of the construct and its impact on technology usage. Journal of the Academy of Marketing Science, 48, 649-669.

Bubou, G. M., & Job, G. C. (2022). Individual innovativeness, self-efficacy and e-learning readiness of students of Yenagoa study centre, National Open University of Nigeria. Journal of Research in Innovative Teaching & Learning, 15(1), 2-22.

Chauhan, V., Yadav, R., & Choudhary, V. (2022). Adoption of E-Banking services in India: An extension of UTAUT2 model. Journal of Financial Services Marketing, 1-14.

Chowdhury, A. Y., & Nehal, M. N. (2020). Effect of corporate social responsibility expenditures on financial performance in banking sector of Bangladesh. Journal of Economics, Business and Management, 8(1), 44-49.

Farah, M.F., Hasni, M.J.S. and Abbas, A.K. (2018), "Mobile-banking adoption: empirical evidence from the banking sector in Pakistan", International Journal of Bank Marketing, Vol. 36 No. 7, pp. 1386-1413.

Foroughi, B., Iranmanesh, M., & Hyun, S. S. (2019). Understanding the determinants of M-Banking continuance usage intention. Journal of Enterprise Information Management.

Ghelani, D., Hua, T. K., & Koduru, S. K. R. (2022). Cyber Security Threats, Vulnerabilities, and Security Solutions Models in Banking. Authorea Preprints.

Gupta, K., & Arora, N. (2020). Investigating consumer intention to accept mobile payment systems through unified theory of acceptance model: An Indian perspective. South Asian Journal of Business Studies.

Haider, M. J., Changchun, G., Akram, T., & Hussain, S. T. (2018). Does gender differences play any role in intention to adopt Islamic M-Banking in Pakistan? An empirical study. Journal of Islamic Marketing.

Hilal, A., & Varela-Neira, C. (2022). Understanding Consumer Adoption of M-Banking: Extending the UTAUT2 Model with Proactive Personality. Sustainability, 14(22), 14708.

Hussain, M., Mollik, A. T., Johns, R., & Rahman, M. S. (2019). M-payment adoption for bottom of pyramid segment: an empirical investigation. International Journal of Bank Marketing, 37(1), 362-381.

Imam, T., McInnes, A., Colombage, S., & Grose, R. (2022). Opportunities and Barriers for FinTech in SAARC and ASEAN Countries. Journal of Risk and Financial Management, 15(2), 77.

Jamshidi, D., Keshavarz, Y., Kazemi, F., & Mohammadian, M. (2018). M-Banking behavior and flow experience: An integration of utilitarian features, hedonic features and trust. International Journal of Social Economics.

Javed, M., Rashid, M. A., Hussain, G., & Ali, H. Y. (2020). The effects of corporate social responsibility on corporate reputation and firm financial performance: Moderating role of responsible leadership. Corporate Social Responsibility and Environmental Management, 27(3), 1395-1409.

Kamboj, S., Sharma, M., & Sarmah, B. (2022). Impact of M-Banking failure on bank customers' usage behaviour: the mediating role of user satisfaction. International Journal of Bank Marketing, 40(1), 128-153.

Kamen, D. (2010), "Mr Segway's difficult path", The Economist, June 10, pp. 1-5.

Lee, J. C., & Chen, X. (2022). Exploring users' adoption intentions in the evolution of artificial intelligence M-Banking applications: the intelligent and anthropomorphic perspectives. International Journal of Bank Marketing.

Kwateng, K. O., Atiemo, K. A. O., & Appiah, C. (2018). Acceptance and use of M-Banking: an application of UTAUT2. Journal of enterprise information management.

Manser Payne, E., Peltier, J.W. and Barger, V.A. (2018), "M-Banking and AI-enabled M-Banking: the differential effects of technological and non-technological factors on digital natives' perceptions and behavior", Journal ofResearch in Interactive Marketing, Vol. 12 No. 3, pp. 328-346.

Manser Payne, E. H., Peltier, J., & Barger, V. A. (2021). Enhancing the value co-creation process: artificial intelligence and M-Banking service platforms. Journal of Research in Interactive Marketing, 15(1), 68-85.

Meet, R. K., Kala, D., & Al-Adwan, A. S. (2022). Exploring factors affecting the adoption of MOOC in Generation Z using extended UTAUT2 model. Education and Information Technologies, 27(7), 10261-10283.

Merhi, M., Hone, K., Tarhini, A., & Ameen, N. (2021). An empirical examination of the moderating role of age and gender in consumer M-Banking use: a cross-national, quantitative study. Journal of Enterprise Information Management, 34(4), 1144-1168.

Miraz, M. H., Hasan, M. T., Rekabder, M. S., & Akhter, R. (2022). Trust, transaction transparency, volatility, facilitating condition, performance expectancy towards crypto-currency adoption through intention to use. Journal of Management Information and Decision Sciences, 25, 1-20.

Moorthy, K., Ling, C.S., Fatt, Y.W., Yee, C.M., Yin, E.C.K., Yee, K.S. and Wei, L.K. (2017), "Barriers of mobile commerce adoption intention: perceptions of generation X in Malaysia", Journal of Theoretical and Applied Electronic Commerce Research, Vol. 12 No. 2, pp. 37-53.

Mostafa, R. B. (2020). M-Banking service quality: a new avenue for customer value co-creation. International Journal of Bank Marketing, 38(5), 1107-1132.

Nguyen, V. A., & Nguyen, T. P. T. (2020). An integrated model of CSR perception and TAM on intention to adopt M-Banking. The Journal of Asian Finance, Economics and Business, 7(12), 1073-1087.

Nordhoff, S., Louw, T., Innamaa, S., Lehtonen, E., Beuster, A., Torrao, G.,... & Merat, N. (2020). Using the UTAUT2 model to explain public acceptance of conditionally automated (L3) cars: A questionnaire study among 9,118 car drivers from eight European countries. Transportation research part F: traffic psychology and behaviour, 74, 280-297.

Nisar, Q. A., Haider, S., Ameer, I., Hussain, M. S., Gill, S. S., & Usama, A. (2022). Sustainable supply chain management performance in post COVID-19 era in an emerging economy: a big data perspective. International Journal of Emerging Markets, (ahead-of-print).

Nyarku, K. M., & Ayekple, S. (2019). Influence of corporate social responsibility on non-financial performance. Social Responsibility Journal, 15(7), 910-923.

Oliveira, T., Martins, C., & Popovič, A. (2014). Understanding the Internet banking adoption: A unified theory of acceptance and use of technology and perceived risk application. International journal of information management, 34(1), 1-13.

Ong, A. K. S., Prasetyo, Y. T., Kusonwattana, P., Mariñas, K. A., Yuduang, N., Chuenyindee, T.,... & Nadlifatin, R. (2022). Determining factors affecting the perceived usability of air pollution detection mobile application "AirVisual" in Thailand: A structural equation model forest classifier approach. Heliyon, e12538.

Parayil Iqbal, U., Jose, S. M., & Tahir, M. (2022). Integrating trust with extended UTAUT model: A study on Islamic banking customers'm-banking adoption in the Maldives. Journal of Islamic Marketing.

Priya, R., Gandhi, A. V., & Shaikh, A. (2018). M-Banking adoption in an emerging economy: An empirical analysis of young Indian consumers. Benchmarking: An International Journal.

Reeves, M., & Sabharwal, N. (2013). Microfinance and M-Banking for the bottom of the pyramid. Journal of Enterprising Communities: People and Places in the Global Economy.

Riffai, M. M. M. A., Grant, K., & Edgar, D. (2012). Big TAM in Oman: Exploring the promise of on-line banking, its adoption by customers and the challenges of banking in Oman. International journal of information management, 32(3), 239-250.

Roy, M., & Das, A. (2018). Impact of demonetization on adoption of digital banking services in India: a case study in rural and suburban area of West Bengal. Indian Journal of Economics and Development, 6(10), 1-9.

Sahoo, D., & Pillai, S. S. (2017). Role of M-Banking servicescape on customer attitude and engagement: An empirical investigation in India. International Journal of Bank Marketing.

Samsudeen, S. N., Selvaratnam, G., & Hayathu Mohamed, A. H. (2022). Intention to use M-Banking services: An Islamic banking customers' perspective from Sri Lanka. Journal of Islamic Marketing, 13(2), 410-433.

Sandhu, S., & Arora, S. (2022). Customers' usage behaviour of e-banking services: Interplay of E-Banking and traditional banking. International Journal of Finance & Economics, 27(2), 2169-2181.

Santini, F. D. O., Ladeira, W. J., Sampaio, C. H., Perin, M. G., & Dolci, P. C. (2019). A meta-analytical study of technological acceptance in banking contexts. International Journal of Bank Marketing, 37(3), 755-774.

Saprikis, V., Avlogiaris, G., & Katarachia, A. (2022). A comparative study of users versus non-users' behavioral intention towards M-banking apps' adoption. Information, 13(1), 30.

Shahid, S., Islam, J. U., Malik, S., & Hasan, U. (2022). Examining consumer experience in using m-banking apps: A study of its antecedents and outcomes. Journal of Retailing and Consumer Services, 65, 102870.

Shaikh, A. A., Glavee-Geo, R., & Karjaluoto, H. (2021). How relevant are risk perceptions, effort, and performance expectancy in M-Banking adoption? In Research Anthology on Securing Mobile Technologies and Applications (pp. 692-716). IGI Global.

Shankar, A., Tiwari, A. K., & Gupta, M. (2022). Sustainable M-Banking application: A text mining approach to explore critical success factors. Journal of Enterprise Information Management, 35(2), 414-428.

Sharma, R., Singh, G., & Sharma, S. (2020). Modelling internet banking adoption in Fiji: A developing country perspective. International Journal of Information Management, 53, 102116.

Shin, J. W., Cho, J. Y., & Lee, B. G. (2020). Customer perceptions of Korean digital and traditional banks. International Journal of Bank Marketing, 38(2), 529-547.

Singh, S., & Srivastava, R. K. (2018). Predicting the intention to use M-Banking in India. International Journal of Bank Marketing.

Skilodimou, H. D., & Bathrellos, G. D. (2021). Natural and technological hazards in urban areas: Assessment, planning and solutions. Sustainability, 13(15), 8301.

Souiden, N., Ladhari, R., & Chaouali, W. (2021). M-Banking adoption: a systematic review. International Journal of Bank Marketing, 39(2), 214-241.

Suhartanto, D., Dean, D., Ismail, T. A. T., & Sundari, R. (2020). M-Banking adoption in Islamic banks: Integrating TAM model and religiosity-intention model. Journal of Islamic Marketing, 11(6), 1405-1418.

Tarhini, A., Alalwan, A. A., Shammout, A. B., & Al-Badi, A. (2019). An analysis of the factors affecting mobile commerce adoption in developing countries: Towards an integrated model. Review of International Business and Strategy.

Tam, C., & Oliveira, T. (2017). Literature review of M-Banking and individual performance. International Journal of Bank Marketing, 35(7), 1044-1067.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. MIS quarterly, 425-478.

Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. MIS quarterly, 157-178.

Zhou, F., Mou, J., & Kim, J. (2022). Toward a meaningful experience: an explanation of the drivers of the continued usage of gamified mobile app services. Online Information Review, 46(2), 285-303.

Zhou, T. (2011). Understanding mobile Internet continuance usage from the perspectives of UTAUT and flow. Information Development, 27(3), 207-218.

Zhou, W., Jia, Y., Yao, Y., Zhu, L., Guan, L., Mao, Y.,... & Zhang, Y. (2018). Discovering and understanding the security hazards in the interactions between iot devices, mobile apps, and clouds on smart home platforms. arXiv preprint arXiv:1811.03241.

Ashraf, S. F., Cai, L., Butt, R. S., Naz, S., & Zafar, Z. (2019). Education as moderator: integrative effect towards succession planning process of small family businesses. *Pacific Business Review International, 11*(12).

Ashraf, S. F., Li, C., Dodor, A., & Murad, M. (2018). Entrepreneurial motivation is the key to success for entrepreneur business. *International Journal of Management Sciences and Business Research, 7*(3), 43-59.