CAPITAL UNIVERSITY OF SCIENCE AND TECHNOLOGY, ISLAMABAD

Factors Impacting the Adoption of E-Banking by Public in Pakistan

by

Nigarish Fazal

A thesis submitted in partial fulfillment for the degree of Master of Science

in the

Faculty of Engineering
Department of Mechanical Engineering

2024

I am dedicating this piece of hard work to my beloved parents and husband who have meant and continue to mean so much to me. Thank you for the constant love, trust and support at my lowest. To my father whose trust has always motivated me to work even harder after every downfall and to my mother whose prayers have always surrounded me.

CERTIFICATE OF APPROVAL

Factors Impacting the Adoption of E-Banking by Public in Pakistan

by

Nigarish Fazal

(MEM213017)

THESIS EXAMINING COMMITTEE

S. No.	Examiner	Name	Organization
(a)	External Examiner	Dr. Afshan Naseem	NUST, Rawalpindi
(b)	Internal Examiner	Dr. Ghulam Asghar	CUST, Islamabad
(c)	Supervisor	Dr Muhammad Javed Hyder	CUST, Islamabad

Dr Mohammad Javed Hyder
Thesis Supervisor
May, 2024

Dr. Muhammad Mahabat Khan
Head
Dept. of Mechanical Engineering
February, 2019

Dr. Imtiaz Ahmad Taj
Dean
Faculty of Engineering
February, 2019

Author's Declaration

I, **Nigarish Fazal** hereby state that my MS thesis titled **"Factors Impacting the Adoption of E-banking by Public in Pakistan"** is my own work and has not been submitted previously by me for taking any degree from Capital University of Science and Technology, Islamabad or anywhere else in the country/abroad.
At any time if my statement is found to be incorrect even after my graduation, the University has the right to withdraw my MS Degree.

Nigarish Fazal

(Nigarish Fazal)
Registration No: MEM213017

Plagiarism Undertaking

I solemnly declare that research work presented in this thesis titled "**Factors Impacting the Adoption of E-banking by Public in Pakistan**" is solely my research work with no significant contribution from any other person. Small contribution/help wherever taken has been duly acknowledged and that complete thesis has been written by me.

I understand the zero tolerance policy of the HEC and Capital University of Science and Technology towards plagiarism. Therefore, I as an author of the above titled thesis declare that no portion of my thesis has been plagiarized and any material used as reference is properly referred/cited.

I undertake that if I am found guilty of any formal plagiarism in the above titled thesis even after award of MS Degree, the University reserves the right to withdraw/revoke my MS degree and that HEC and the University have the right to publish my name on the HEC/University website on which names of students are placed who submitted plagiarized work.

Nigarish Fazal

(Nigarish Fazal)
Registration No: MEM213017

Acknowledgement

First and foremost, I would like to thank my Allah Almighty who has helped me throughout my life.

I would like to pay my sincere gratitude to Dr. Muhammad Javed Hyder for the supervision provided throughout my research work. I am grateful for his guidance, motivation and support during this time period. His patience and believe in me motivated my spirit to complete this research work.

A special thanks to my family for their boundless efforts and support they have always provided. I would have not been able to do anything without their support.

(Nigarish Fazal)

Abstract

In the digital world today, it is very important for a country to grow digitally. The factors that influence of adoption Electronic Banking system profiles the way individual's preferences to financial facilities offered by one's country. This study explores the impact of security factors, user friendliness and customer services on the adoption of digital banking also called Electronic Banking in Pakistan.

This work analyzes the User Friendliness (UF), Customer Services (CS) factors and Security Factors (SF) directly or indirectly impacting the Technology Acceptance Model (TAM) and that ultimately impacts the adoption of e banking channels in Pakistan. User Friendliness and customer services are a common and most influential factors that impact TAM. The questionnaire is prepared according to the scope and distributed among various users of e banking channels. The response of the participants are analyzed through SPSS also known as Statistical Package for Social Sciences. Three hypothesis are build up to study the impact of factors impacting the adoption of e banking in Pakistan.

Contents

List of Figures

List of Tables

Abbreviations

ATM	Automatic Teller Machine
CS	Customer Services
E-Banking	Electronic Banking
IVR	Interactive Voice Recording
IB	Internet Banking
SF	Security Factors
TAM	Technology Acceptance Model
UF	User Friendliness

Chapter 1

Introduction

1.1 Background

History of currency goes back to the pre-currency era also called barter system when people traded food against services directly and then slowly and gradually the concept of metal coins began to take over the financial system of the world. Chinese were one of the first people who began to use the paper money instead of metal coins. As the trade began to expand all over the world, the banking system took into place which gave birth to International Monetary System. In today's world, the paper money is converted to digital money [1].

Technology has evolved drastically now a days. If we look back, one will be amazed to see how far we have come in aspect of technology. From the currency of metals and stones to digital currency where people can only see digits depicting their money, technology evolution played a huge role through this journey of financial development across the globe [2]. Hence, the emergence of the digital currency has shaken the overall status of the financial world. With respect to the global view, world's financial industry has started to invest their manpower and efforts on digitalization of the currency [3].

The banking sectors have been the back of economy for any country since the days of stone-age. The only fact that back in stone age, people do not have big buildings called banks now a days but the currency still existed back then, in the shape of

sticks, stones, food and many more. The history of currency digitalization is rich and vast. The banking sector, plans and executes the economy of each country and monetary actions for each of them. Any downfall in the currencies may impact the financial standards and currency all over the world[4].

As the technology grows and people began to adopt E-banking system, challenges and issues are faced by people. One of the study[5] conducted by Belbergui Chaima in 2020 to identify the issues faced by the people. He finds that security, risk factors, cost factors and frauds were one of the main issues faced by people. Preety Rana and Duresh Panday in one of their research study[6] identified that factors like security, theft, phishing etc may be one of the reasons that impact or influence the adoption of e-banking system. In one of the journal [7] by Amul Fatima, it was explicitly mentioned that privacy concerns are one of the main factors that impact the adoption of the e-banking system. Amul Fatima also suggested the solution that one can opt biometric verification system to minimize the privacy and security issues.

1.2 Problem Statement

In today's digital age, electronic banking (e-banking) has become the main module of financial industry. However, the adoption of e banking varies all over the world depending upon the demographic characteristics and multiple factors. Factors like security, trust in technology, cultural variations etc. shapes ones willingness to adopt the e-banking system. These factors influence the adoption of E banking system.

Identification of the factors that are influencing the people of Pakistan to adopt the e banking services.

1.3 Research Questions

- What is the impact of security factors on adopting e-banking system in Pakistan?

- What is the impact of User-friendliness of various E-banking channels on adopting e-banking system in Pakistan?
- What is the impact of Customer services provided by banks on adopting e-banking system in Pakistan?
- What is the relationship of age and gender on adopting the e-banking system in Pakistan?

1.4 Research Objectives

- To study the impact of security factors on e-banking system adoption in Pakistan
- To study the impact of User-friendliness of various E-banking channels on e-banking system adoption in Pakistan
- To study the impact of Customer services provided by banks on e-banking system adoption in Pakistan
- To study the impact of gender and age on e-banking system adoption in Pakistan

1.5 Introduction

Electronic banking (also known as E-Banking or Internet Banking (IB)) provisions the delivery of banking products and services through digital delivery channels like Automatic Teller Machines (ATMs), Mobile Apps, Unstructured Supplementary Service Data (USSD) Channels and many more. E-banking (or Internet Banking) is a service provided by the financial bodies that provides its customer the facility to conduct the banking services like:

- Transferring funds,
- Paying bills,

- Access the bank accounts,
- View the account balances,
- Withdrawal of money and
- Anything imaginable banking related activity.

Electronic Banking has been very popular in early times in the form ATMs which is now continuously evolving through internet. E-banking has potentially transformed the banking business as it has lowered the cost of transactions and delivery of other banking services. Electronic Banking has been providing the flexibility and accessibility to the customers which allows them to use the desired service anytime and from anywhere from the world. It allows the faster processing and reduces the extra effort of paper work[8]. It has also reduced the workload from the bank employees since customers are directly carrying out the activities from outside the bank and at any time of the day. Internet technologies have evolved and have a great potential that has changed the banking industry. E-banking has transformed and digitized the Banking Industry. The best technology that has helped banking system to digitize and prosper in digital world was of Automatic Teller Machines (ATM). ATM technology was the first digital banking service provider which has revolutionized the whole banking sector by giving an idea of how banks can provide the banking services just on a single click from any part of the world. There are three main types of E-Banking Channels:

1. Mobile App Banking
2. Internet Banking
3. Telephone Banking.

Mobile App Banking as its name implies the transactions and fund transfer through Mobile App was introduced in early 2000s [9] made into practice by financial institutes. It allows users to use a specific mobile App of a particular banking system to manage the finances remotely without going to the brick-based branches of banks. Some common examples of Mobile App services are accessing:

- The account information, as a customer logs in to the mobile app which is secured (multi-level) by the credentials set by the user, he can view the account information like bank account holder names, account number, names and information of beneficiaries etc.
- Fund Transfers like sending money within the banks and across the Banks known as Inter-bank Fund Transfer.
- One of the amazing advantages and the feature the mobile banking Apps now a days provide with the feature of paying bills without a hefty process by a single click on Utility Bill Payment Company of their choice.
- Along with these features, customers can get the alerts and notifications on their phones which keep them posted and updated. Mobile App provides a number of services.

Below is list of Services provided through Mobile App:

1. Account Management
2. Inter Bank Fund Transfer (IBFT)
3. Fund Transfer (FT)
4. In App Utility Bill Payment System
5. Credit Card Management
6. Loan Services Management
7. Mobile Top-Ups
8. Branch Locator
9. Customer Support
10. Notification and Alerts Management.

Internet banking itself depicts the usage of this type by its name, it is a web-based baking system which allows the users to manage their funds remotely.

While using this type of e-banking system customers' needs to have access to a PC and an internet system. Usually while accessing this type of e-banking system the authentication tokens are generated for security purposes. It also enables a user/customer to add the digital signature for keeping the accounts more secure. Internet Banking offers all the all the services provided by the Mobile App as mentioned above. The only difference is of accessibility. If a customer does not have access to their Mobile Phones for using the Mobile App Banking, they can access the web-based services of their banks where you get a replica of Mobile App. Telephone banking has two types:

1. Interactive Voice Recording (IVR)
2. Real Time call center

Interactive Voice Recording (IVR) enables a user to get an automated response on the phone. IVR services use the pre-recorded voice system that allows a user to perform a certain function. It allows the user to use the services of banking without human intervention [10]. It helps the user to troubleshoot the issues, book the complaints, report an instant issue like blocking the debit cards or apps in case of any unfortunate situation like theft etc. **Real time call center**, where agents are active 24/7 to cater the requests of a customer. This allows customer to call on a specific help line that connects the customer to an agent and registers the complaints or guides a customer for any kind of service requested. Traditional banking was physical decentralization of branches if the banks scattered over the country. A customer must visit a branch in order to avail the services offered by a bank like cash deposit, cash withdrawal, fund transfers etc. on the other hand E-Banking has prevailed as a system that allows the customers to use the same services without visiting the specific branch or branches of the banks. It has recently employed by many financial institutes and banking service providers. Over the recent years it is identified by many researchers that e-banking has reduced the cost of customer service, increased the speed of services like Fund Transfers (FTs) and many more [11]. E-banking is not only getting the strong grounds in developed countries but it is also prevailing in the developing countries. E-banking is very convenient and it saves time. One of the studies in Malaysia [12] shows that

the gap among the international level adoption if E-banking system and national level adoption of this digital system.

Internet banking or Electronic Banking is a type of E-business which is now a days the most popular and considerable among the general public. Moving with the fact that, are we ready for this evolution or still want to keep on adopting the traditional banking systems. This research will identify what keeps the Pakistani banking customers away from adopting this revolutionary banking system. A researcher examines the readiness of the people that want to adopt this revolutionary system. V. Maugis et al [13] carried out a research to investigates what the trust plays the role while adopting the Mobile banking Apps as the means of banking system in the developing countries. R. F. Malaquias and Y. Hwang [14] conducted survey in Pakistan among the 325 Mobile Banking App users. They found that trust plays a very important role for people to switch from traditional baking to the e-banking system. The trust that as service provider develops among the people is very influential factor among the users. The study also identifies that the people tend to trust in government and technology in order to accept Mobile App banking system. The study concludes that as compared to international level adoption of e-banking system, within Pakistan it is important for the service providers to gain the trust of the users by prioritizing the security and improving the transparency of their services. It is suggested that government plays a very important role in providing the awareness among people which creates a level of trust for using such kind of services. Different campaigns among the people should be conducted which can keep people well aware of international standards of banking system. In this way government can regulate the service providers while providing the security to the users.

1.6 Technology Acceptance Model (TAM)

In order to study and understand the factors affecting the adoption of electronic banking system, number of theoretical models are used. In this research study Technology Acceptance Model also known as TAM is adopted to study the factors influencing the adoption of E-banking in Islamabad, Pakistan. TAM is one of

the most frequently adopted theoretical model because of its easiness, reliability and flexibility having an effectual explanatory power [15]. TAM consists of two major core variables i.e. perceived ease of use and perceived usefulness that helps to evaluate and study the adoption of various technologies [16]. In this research study, below two core variables of TAM will be categorized in to multiple sub-measures to study the significance of different factors impacting the adoption of e banking system in Islamabad, Pakistan.

1. Perceived ease of use
2. Perceived usefulness

Chapter 2

Literature Review

S.Sharma et al carried out a multi-analytical study that was conducted in Bangladesh to investigates the factors influencing the adoption of e-banking system in a developing country [17]. S.Sharma's study is based on the survey that was conducted among 208 Mobile App users for the banking services. Technology Acceptance Model (TAM) was implemented during this study and it was revealed that perceived use of ease and demographic variables were not statistically significant whereas, the following variables were assigned a high significance and importance by neural network model.

- Social influence in the people
- The level of trust
- How people perceive the ease of using the e-banking systems

As a matter of fact, the people tend to use the apps that are easy to use and they perceive it to be useful. Meanwhile, it was also identified that trust on service provider is also an important factor that allows a user to adopt the e-banking system. Recommendations from friends and family also matters a lot and contributes in adopting this revolutionary system. It is concluded that the system electronic bank service providers should focus on creating the awareness among the people of developing countries that how useful, easy and trust worthy is the adoption of

the internet banking.

N.Popoola carried out a qualitative study in Nigeria [18] where interviews were conducted among customers of 40 banks in order to investigate the effect of trust in adoption of internet banking. The study revealed that factors that were affecting the people to adopt internet banking were the security issues, bank reputation, trust on the company and technology.

Financial Education refers to having financial literacy which includes the process of learning different concepts of how to manage your personal finances and use your money in an effective manner. It can be delivered through various channels like schools, social media, seminars etc. The role of financial education is also highlighted and considered to be very important factor that contributes the facilitation for the adoption of e-banking system.

P.Tobbin [19] carried out a study in Ghana to identify the factors that influence the acceptance of e banking system by unbanked people. Technology Acceptance Model (TAM) was implemented to find out the factors affecting the acceptance of e banking system in Ghana. The discussion was carried out where open ended questions were asked so the people could clearly address their concerns and queries with the focus on consumers. The findings may help the policy makers to include the awareness of financial education to the unbanked people of a developing country so that e-banking may cover the gaps which are identified at international level. It is clearly identified that the gaps include the following list of factors in comparison of developed countries:

1. Poor technology infrastructure
2. Financial illiteracy
3. Internet Connectivity Issues

The fact that banking system is globalizing day by day. It is becoming popular and adopted in developed countries like China, US, etc. the factors that contributed the growth of the banking system are studied by many researchers [20]. Factors like technology boom, increasing of competition and cross border transactions and financial flows that contribute in globalization of e-banking system. In opposite to

the factors contributing the globalization is the challenges that are faced are the potential risks, the financial instability of a country and also the unawareness of the technological use like usage of smart Mobile phones, Internet etc. among the general public. It is identified that the key drivers of the e-banking globalization are advances in technology with international level, changes in the frameworks of regulatory bodies and competition among the international financial institutes. A developing country must be competitive internationally in order to cover up. The policy makers of a financial institute must be able to identify the key drives of globalization of the e-banking systems so that general public should stay aware of technological use.

In recent years, E-banking has been growing rapidly in Pakistan. More and more people are adopting E-banking system in Pakistan from not carrying cash to usage of online money transfer in daily routine for various purposes. Banks are digitally transformed in Pakistan to facilitate the customers all over the world. However, in Pakistan there are few challenges need to be eliminated. Pakistan being a developing country lacks financial and digital literacy a lot. People in Pakistan are usually pushed back to adopt E-banking system because they don't have much knowledge that how secure the e-banking system can be.

A study[21] was conducted by Atif Ali Gill that examines that E-banking by using cognitive motivational theory by considering the top five Private Pakistani bank population that identifies the e-banking factors impacting the customers loyalty. It was found that factors like web-designing, service quality and informational quality have a positive effect on customer loyalty. The author suggests that e-banking system in Pakistan can be improved by adopting some international standards like considering the customer needs. These needs and gaps are listed as below:

1. Friendly user interface
2. Better Services
3. Easy Digital Journey

Since customer loyalty plays a very important role in success of manufacturing of organizations. It is very important to consider the customers loyalty in order

to maintain the success of an organization. Usually organizations tend to invest money on advertisements and marketing strategies which is one of the factor customers are kept attracted and aware of the services that a bank is providing. Technological innovation is one of the factor that can eliminate above mentioned gaps by inducing user friendly interfaces. Customer can experience a very smooth and easy user journey which helps the banking system to maintain the number of loyal customers. On the other hand it is suggested by researches [22] that the wide use of technology shifted the traditional delivery methods to the advance digital delivery channels. On the basis of which Pakistan's e-banking system is based upon. The introduction and implementation of the technology can cover up the gaps like providing better services as compared to international standards. Where customer will not face the lags and delays during the routine usage of Mobile Apps and other digital e-banking channels.

A case study[23] conducted by J. R. Kala Kamdjoug for the use of e-banking and customer e-engagement was held in a country named Cameroon in South Africa. The study was carried out for NFC bank in Cameroon. Since Cameroon is an developing country so considering the factors it was identifies that following were the main gaps that the bank had in comparison to an international standard e-banking system:

1. Customer Trust in technology
2. Ease of Use i.e Customer Friendly interfaces
3. Perceived usefulness
4. Security

Additionally study suggested that NFC Bank of Cameroon can eradicate these gaps by providing a better platform to its customers. The platform provided to customers should be convenient to use and should be easily accessible without any hefty process. This promotes and interactive platform leading to satisfactory customers experience. The case study for NFC Bank Cameroon helps to high spot the challenges in context of a developing country. The study found out that despite of making the e-banking platforms interactive and accessible still the country

faces the challenges like low internet connectivity and financial illiteracy among the general public. Generally, this case study for NFC Bank Cameroon suggests that e-banking can be made potentially improves by promoting the financial and digital awareness among the customers. However, e-banking systems needs to be such that customer needs are fully addressed. It is recommended to also address the factors of providing a secure banking system to the customers along with investing in developing the platforms that are very interactive to use for a general customer.

A case study[24] was held by Y.K Nagar in India which compared the e-baking adaption rate of the customers among two Banks of India namely; State Bank of India (SBI) and Housing Development Financial Cooperation (HDFC) Bank. This case study highlights that banking through digital platforms has significant effect on preferences of the customers. Customers prefer digital banking over traditional banking services if the provided platform is interactive and accessible. The study also found the HDFC Bank is more alert and tend to be more responsive to the customer needs as compare to the traditional banking system of SBI. Which clarifies the point that the e-banking systems should be more flexible and alert while considering the customer needs. In comparison, SBI have a very slower response to the customer needs. A clear gap was identified here that is an e-banking platform should be aware of market needs. SBI in contrast also tend to lose the number of customers for not being actively responsive to market changes. An e-banking system should be very responsive in order to be remain competitive.

In article [25] V. Thi and K. Chi examines the factors that affect the customer's satisfaction and intentions towards the usage of e-banking systems in Vietnam. This Study adopted the Technology Acceptance Method (TAM) for their study. TAM is basically a theory where it studies how users come and accept/adopt a certain technology. It highlights that below are the gaps in contrast to international level standards of e-banking which usually a developing country like Vietnam experiences:

1. Perceived Ease of Use
2. Perceived Trust in technology

3. Lack of Financial Education

In order to increase an improve the adoption rate of e-banking system a Bank should focus on hoe interactive the platform hey are offering can be in addition to the of financial awareness. The study also highlights that the demographic factors such as age, gender and income can play vital role in adoption rate of e-banking system. It was found that the customers with less age tend to use e-banking more than people who are older. Also, people with higher income use e-banking system. It proves that educated people with better financial knowledge prefer digital banking over traditional banking. The mentioned gaps can be covered by inducing advertisements that promote financial knowledge and digital literacy.
Rapid technological changes have changed our lives over a number past years. Some studies suggest that developed countries like Japan and Korea are among one the top countries which follow and maintain the international standards of e-banking system [26]. Following are some international standards followed by Japan and Korea:

1. IS0 27001: This standard outlines the best practices of the Information Security
2. Payment Card Industry Data Security Centre: Sets Security standards for the Card holders.
3. Basel Committee on Banking Supervision: This committee allows to set the international guidelines in order to practice best Risk Management Techniques.
4. Financial Action Task Force: It helps to avoid fraudulent activities and Money Laundering.

In fact Pakistan follows all of above international standards but still the gaps like Financial and digital illiteracy over comes the adaption rate of e-banking system. Thus it is very important to follow these standards in order to keep the customers adoption rate up to the mark. A study by A.Tahtamouni [27] was held in Jordan to study the dimensions of quality that may impact the adaption of electronic

banking system. A.Tahtamouni studied the relationship of ease of use, security, confidentiality and safety with the customer satisfaction by implementing Technology Acceptance Model (TAM). It is found in this study that the significance of the dimensions of quality i.e ease of use, security, time and confidentiality were higher. Thus reveals that bank needs to keep the level high for these factors in order to maintain the customer satisfaction and electronic banking adaption.

B.Almansour et al. [28] carried out a study in Libya to study the impact analysis of perceived use of ease, perceived credibility (security) and customer attitude towards the adaption of electronic banking system. This study was a descriptive analysis where 215 surveys were distributed among Libyans to study the customer satisfaction followed by use of ease, perceived credibility and perceived usefulness. It was concluded that security and perceived use of ease had a higher impact on public satisfaction for adopting electronic banking system.

Ali Khan Junaid et al. [29] distributed questioner among 350 people in south Punjab, Pakistan to study the impact of reliability, safety, security, effectiveness, efficiency and responsiveness upon the customer satisfaction for electronic banking services. This study revealed that efficiency and reliability are the main factors impacting the customer services followed by security, responsiveness and safety.

A new model of Technology Acceptance Model (TAM) was proposed by M. Almaiah et al. [30] where it was categorized into six main sub measures i.e perceived security, perceived use of ease, perceived risk, service quality, perceived trust and usefulness by using Structural Equation Modelling (SEM) to study the impact of adoption of mobile banking apps. This study found that perceived security, perceived trust and ease of use plays an important role for adoption of mobile banking apps. Whereas, the perceived risk had a negative impact. B.Kaulu et al. [31] carried out a study where they studied the customer's aim to adopt the electronic banking system. Perceived use of ease, perceived usefulness, security and privacy were the main factors identified in this study which had an impact on rate of adoption of electronic banking system. Data for this study was collected from 209 people upon random selection. The perceived risk of cybercrime strengthens the relationship between the perceived use of ease and adoption of electronic banking system. Security ensures the confidentiality of customer's financial data.

It is very important for any customer to maintain the privacy. This may lead to loyal bank customers. A study by D.Gautam et al. [32] was held where the impact analysis was carried out between the customer satisfaction and electronic banking customer's loyalty. The E-S-QUAL model was adopted to measure the service quality of electronic banking system. It was revealed that the proficiency of the electronic banking channel is highly influencing the customer's adoption of electronic banking system. The security and user friendliness are also highly contributing to the customers loyalty.

A study was carried out by V.B.Prasad et al. [33] where the factors affecting the adoption of electronic banking services were studied in detail. It was mentioned in this study that quality of information, security, and usability of web based banking services, convenience and privacy were the factors that were impacting the rate of adoption of electronic banking system.

J.Situmourang [34] in one of his study in 2024 studied and compared the adoption of Internet Banking and Mobile App banking by the impact analysis of security factor. This study revealed that the number of customers using mobile apps banking are larger than the users of internet banking. The customers find the security of mobile app banking more in practice than internet banking.

A case study was carried by S.Singh et al. [35] to study the behavior of customers towards the banking services provided by the banking sectors in Maihar city of India. They used qualitative and quantitative research approach to study the adoption, satisfaction and usage of electronic banking services by public. This study finds and concludes that banks in Maihar need to improve the security, support to the customers and better customer experiences. Understanding the customer behavior towards the electronic banking services is very important for the adoption of these services.

2.1 Literature Summary

According to the past studies discussed in the above section, it is identified that below are three main factors that influence the adoption of electronic banking system:

1. Security
2. Customer Services
3. User Friendliness

Below Table 2.1 shows the overall summary of the above factors and their respective references.

TABLE 2.1: Summary of Literature Review

Factor	**References**
Security	[17] [23] [25] [27] [28] [29] [30] [31] [32] [33] [34] [35]
User Friendliness	[17] [18] [21] [23] [27] [28] [30] [31] [32] [33] [35]
Customer Services	[17] [19] [21] [23] [24] [27] [28] [29] [30] [32] [35]

Chapter 3

Research Methodology

3.1 Research Philosophy

Research Philosophy is the set of norms or beliefs that designs and executes a research study. It helps to justify the researcher's point of view to the world. Research Philosophy contains Positivism, interpretivism and pragmatism [36]. **Positivism** is the approach that is based on logic, reasoning and mathematical proofs[37].Whereas, **interpretivism** is the philosophical approach which is based on sociological method of research in which any event or action is analyzed based on the beliefs, norms and culture of the society[38]. **Pragmatic study** on the other hand, deals with the approach of facts and figures. It comprises of both subjective and objective approach[39].

In this study inter-pretivism philosophical approach is adopted. The goal of the inter-pretivism research is to study relationships between social factors and people. This helped to make accurate and positive predictions about the social adoption of e-banking system by different people of the society. It finds out how people react to different situations and deal with them accordingly.

3.2 Research Methodology

A research design is a structural framework that highlights the outlines of the

whole research process that a researcher uses to carry out a study or an investigation. The research design ensures that a study is well-organized enough to answer the researcher's questions with logics and reasons [40]. It comprises of a plan that answers the general researchers' questions i.e what, when, how and why?
This study is an exploratory research approach being qualitative. This questioner/Survey focuses to collect data that is primarily cross-sectional.

3.3 Population

In research analysis, population is defined as the group of interest that you select for a particular study[41]. The population of this study comprises of customers and ex-customers of Banks that are offering E-banking system. The participants of this survey belonged to age group starting from 18 years and above that once used or are using the E-banking system. Respondents were approached through professional and personal contacts by sending emails/messages etc and by distributing the survey/questioners randomly among the E-banking users.

3.4 Sampling Technique

There are two types of sampling techniques i.e probability sampling technique and non-probability sampling technique. In probability sampling technique the population size is known and all the population has equal chance of being selected as subject. It is further classified into simple random, stratified random, random cluster and systematic random[42]. In non-probability sampling technique the population size is unknown and all the population do not have an equal chance to be selected as subject. It is further classified into, convenience, consecutive, snowball, quota and purpose sampling[43].

This study is identified to have non-probability sampling technique with convenience sampling. Non-probability sampling is used in this research study because the aim is to gain the view of targeted set of people based on their characteristic

of being the customer or ex-customer of electronic banking system, where convenience sampling is done when researcher needs easy and available data [44]. The sample data and subjects are closely in contact with the researcher. This sampling data is the convenient of all to implement which facilitates the researchers with the results in a short time period.

3.5 Sample Size

By using the rule of thumb to estimate the sample size we use below formula.
N = 5 x (No of questions in questionnaire)
No of questions in questionnaire = 32
N = Sample Size
N = 5 x 32
N = 160

3.6 Sampling Error

It is the measure of deviation of sampled value from the true population. It is the amount of inaccuracy while we estimate some values in a survey analysis.

3.7 Unit of Analyses

The unit of analyses are the individuals who are or were the customers of any banking services offering electronic banking system.

3.8 Data Collection Method

Self-managed questioners were used to collect the data among the population selected. The data was collected in the time period of two months.

3.9 Questionnaire Design

The questioner comprises of the demographic questions where age and gender of the respondent is asked. It also comprises of questions related to below mentioned factors that may influence the adoption of e banking system.

1. Security
2. Customer Services
3. User Friendliness

Questions related each factor is asked with regard to Mobile App banking, web based banking and ATM services.

3.10 Conceptual Framework

The goal of this research is to study the impact of various factors that affect the adoption of e-banking systems in Pakistan. In the literature review, various theories are relevant for the adoption of technology to study consumer behavior.

Figure 3.1 shows the research model of this study. Customer services and security are independent variables, whereas user friendliness is the dependent variable. Customer services will impact the perceived use, and perceived ease of use is impacted by user friendliness, ultimately indirectly impacting the adoption of e-banking.

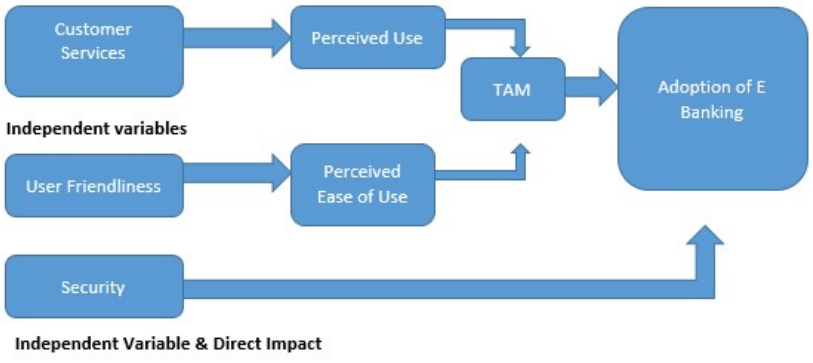

FIGURE 3.1: Research Model

3.11 Development of Hypothesis

H_1 : Security Factors (SF) have a positive and significant relationship in adoption of e banking system.

H_2: Customer Services (CS) have a positive and significant relationship in adoption of e banking system.

H_3: User Friendliness (UF) have a positive and significant relationship in adoption of e banking system.

Chapter 4

Data Analysis and Research Findings

This part of the research will explain the data analysis and the findings of overall research which is done by using the data analysis tool called Statistical Package for Social Sciences (SPSS) version 25.0. Descriptive analyses are adopted to analyze the demographic part/profile of the respondents/participants in the survey.
In this part of the research, response rate, evaluation of each factor involved and demographic effect on the factors influencing people from adopting the E-banking.

4.1 Analysis of Response Rate

Total surveys that were distributed online were 60 and the responses received was from 42 people. However, physically 100 surveys were distributed among the general population and 67 responses were received. Which means 160 surveys were distributed including physical and online surveys out of which 109 responses were received. The response rate is 68% Below Table 4.1 summarizes the above Figures.

The low response rate is due to lack of good internet connection for people responding through online surveys and uncooperative people for physical survey responses. Most people do not have much time and interest to answer the questions with full

TABLE 4.1: Analysis of Response Rate

Description	**Outcome**	**Rate**
Surveys distributed	160	100%
Surveys Responses Received	109	68%

interest and honesty approached either way. This proved to be a huge challenge to me while performing the research.

4.2 Data Screening

Data screening is the process where any missed, duplicate, incorrect or incorrectly formatted data is removed or fixed. In this research study it is ensured that the data is entered correctly in the data sheet and screening/data cleansing is performed. For further evaluation and analyses the data SPSS version 25.0 is used. In this research, qualitative data coding is adapted in a way that normality tests are conducted through it. Hence in order to achieve the accuracy and optimum results, missing values and normality tests are performed through SPSS.

4.3 Missing Values

During the data collection process some questions are left responded. This values of a particular question are said to be missing values in data collection sheet[45]. In this research, it was ensured that no value is missed by cross checking the filled online questioners and also the physically filled questioners, considering the dangers connected with missing values in a research analysis part of the study. By checking the data collection sheer multiple times, it was concluded that no data has been missed.

4.4 Normality Test

One of the common and most important factors in research analysis is to find out

whether the population is normally distributed or not.

In research industry, many methods for normality analysis have been used and suggested. In this research, normality is performed. Normality can be measured by graphical or statistical analysis [46]. The most used and important techniques of Normality test analysis are skewness and kurtosis.

4.5 Skewness

Skewness is the measure of asymmetric distribution, i.e the distribution is asymmetric when its left and right images are not mirror images of each other. Skewness may be positive, negative or zero depending upon the direction if tail or value.

4.6 Kurtosis

Kurtosis is the measure by which probability distribution falls towards the positive or negative side (tails) instead of the center.

In graphical analysis, the normality analysis is done through the analysis of residual plots of histograms, through which one can easily indicate the normal distribution if multiple variables. However, if we talk statistically, the scores/range of skewness must be between +2 to -2. Similarity, the range for kurtosis must be between +7 to -7.

As per the below normality test scores of skewness and kurtosis for different variables it is identified that score/range of skewness lie between +2 to -2 for all variables and +7 to -7 for kurtosis. Which proves that the population's normally distributed. Hence, the normality test is successfully conducted.

Below Table 4.2 shows the skewness and kurtosis ranges for all variables.

TABLE 4.2: Explanation of Variables

Variables	Explanation	Skewness	Kurtosis
S1	Security factor impact while using Mobile Banking App	-1.876	3.51
S2	Security factor impact while using Web-based Banking Channels	-1.006	-1.006
S3	Security factor impact while using ATMs	0.969	-1.081
UF1	User Friendliness impact while using Mobile Banking App	-0.742	-0.376
UF2	User Friendliness impact while using Web-based Banking Channels	-0.574	-0.175
UF3	User Friendliness impact while using ATMs	-1.042	0.874
CS1	Customer Service Impact while using Mobile Banking App	-0.546	0.338
CS2	Customer Service Impact while using Web-based Banking Channels	0.134	0.156
CS3	Customer Service Impact while using ATMs	-0.441	0.238

4.7 Demographic Characteristics

Demographic characteristics such as age, gender and education can greatly influence in adopting different factors [47].

In this research, descriptive statistics are analyzed to understand the vital role of people while adopting E-banking. We have analyzed how age and gender can influence the adoption of different channels of E-banking systems.

TABLE 4.3: Demographic Characteristics

S No	Items	Categories	Frequency	Percentage
1.	Gender	Male	53	48.6
		Female	56	51.4
2.	Age	18-24	15	13.8
		25-34	49	44.8
		35-44	15	13.8
		45-54	15	13.8
		55+	15	13.8

Above Table 4.3 summarizes the overall frequency and percentages of the demographic profile of the respondents for this survey. It is clearly mentioned in above tabulated summary that female's respondents are 56 out of 109 respondents in number with the percentage of 51.4 while the male respondents are 53 out of 109 respondents with the percentage of 48.6. Which shows that the males and females almost equally participated in this survey. But if we see the age groups, we find that 49 out of 109 respondent's maximum number of respondents lie in the age group of 25-34 years with total percentage of 44.8. While only15 respondents were the age group of 18- 24 years, 15 for 35-44, 15 for 45-54 and 15 for 55+. This number is very low with the contribution of 13.8% out of 109 respondents.
E-banking channels are mostly used by the age ranging from 25-34 years of age group in Pakistan, which can be a result of more familiarity with technology and also because most of the people may be working and e-banking channels may be the their use on daily basis. Also majority of Pakistani population is generation so our analysis properly depicts the population. This result shows that people with age range of 25-34 years in Pakistan find e-banking channels to be more convenient in aspect of time management by avoiding long queues in bank for small operational processes. People with ae range of 18-24, 35-44, 45-54 and 55+ are less aware of the benefits of usage of digital banking system and prefer to continue with already adopted methods and are hesitant to the change.

4.8 Analysis of Usage of E-Banking Channels In Pakistan

In this survey, 109 random people were asked the usage of E-banking channels where options were categorized as Daily, Weekly, Monthly and Rarely. Options Daily and Weekly can be further considered as "frequent usage" while discussing the results. Whereas the options monthly and rarely will be considered "not often used" in this discussion. SPSS Version 25.0 is used for this question for descriptive analysis.

How often do you use e-banking services? Below table 4.4 shows that out of

Table 4.4: Usage of E-Banking Services

	Frequency	**Percent**
Daily	40	36.7
Weekly	47	43.1
Monthly	16	14.7
Rarely	6	5.5
Total	109	100.0

109 respondents, 40 respondents use the E-banking services on daily basis while 47 respondents out of 109 people use E-banking services on Monthly basis. From these Figures it is concluded that most of the people of Pakistan with age range of 25-34 years use E-banking services frequently. On the other hand 16 respondents use the E-banking services on Monthly basis. However, 6 respondents use on Monthly basis. Hence, 22 respondents out of 109 respondents are considered to be using the E-banking channels less frequently.

It is observed that age group of 18-24, 35-44, 45-54 & 55+ years use the E-banking services on Monthly or rarely basis only. While the age range of 25- to 34 years respondents mostly use E-banking services on frequent basis as this age group has contact and familiarity with technology more than any age group. One of the factors may be that this age group of Pakistan is currently the bread earner. They deal with money flow by paying bills, rents, buying groceries etc on frequent basis. This age group in Pakistan is also the busiest one so they don't have much time to wait in bank queues for cash withdrawals or deposits and paying bills etc instead they find it much easier to do all financial activities through digital banking channels.

4.9 Security Factors Impacting the Adoption of E-Banking Channels

1. Mobile App
2. Web based Channel
3. ATM

4.9.1 Influence of Security Factors on Mobile App

It is very concerning and important to understand that technology comes up with several challenges and security concerns. Substantial security concerns like theft, fraud, hacking attacks and many more may influence the adoption of digital banking channels [48]. In this research study, 109 respondents were asked multiple questions related to security of E-banking channels through which impact of the adoption of E-banking system in Pakistan is analyzed. Below Table 4.5 shows the responses when asked question if they have every faced security concerns.

Have you ever had Security concerns while using Mobile App e-banking services platforms?

TABLE 4.5: Security Concerns in Mobile App E-Banking Services

	Frequency	**Percent**
Yes	65	59.6
No	44	40.4
Total	109	100.0

It was asked from people that have they have had any security concerns while using Mobile App for E-banking. The answers were categorized into Yes and No. While performing statistical analysis in SPSS version 25.0, answer "Yes" was mapped against "1" and "No" was mapped against "2". The purpose of mapping the answers to numeral was of easy statistical analyses. In the above Table out of 109 respondents 65 respondents had replied with "Yes" upon asking if they had faced any security concerns while using the Mobile App for E-banking. While 44 of the respondents relied with "No" against the same concern. It is seen that majority of the people are facing the security issues which draws the banking customers back from adopting the E-banking system. Further, the exact security concerns were asked from the customers. In this part of research analyses, below are the security concerns listed that the 65 respondents faced:

1. Skimming
2. Hacking of E-banking Mobile Apps
3. Private Data Leakage (passwords etc)

4. Scamming from own banking employs

It is observed that almost all of 44 respondents had concerns of hacking and data leakage which influence the customers for adoption of Mobile Banking. Upon asking if they have experienced theft and fraud while using Mobile Banking and 28 people responded in "Yes". This makes the overall image of mobile app to be un-safe.

4.9.2 Influence of Security Factors on Web-based Channels

Web-based channels are hosted on URLs which can be accessed through any browser on your laptop or mobile [49]. Fraud, theft and skimming is not only limited to Mobile Banking App but also it is a threat to online web based system of banking. In this research work, below table 4.6 shows the summary of frequencies Yes = 1 & No = 2 (mapped to numerals) along with percentages of if people have ever faced security issues while using web-based banking.

Have you ever had Security concerns while using Web Based Internet Banking services platforms?

Security Concerns	**Frequency**	**Percent**
Yes	32	29.4
No	77	70.6
Total	**109**	**100.0**

TABLE 4.6: Stats for Security Concerns While Using Web Based Banking System

Surprisingly, the above table shows that 77 respondents out of 109 respondents do not face any challenge while using web-based banking system. However, only 32 respondents have faced the security issues. Below is the list of concerns in this case:

1. Skimming

2. Hacking of E-banking Mobile Apps

3. Private Data Leakage (passwords etc)

4. Scamming from own banking employs

This is a positive finding as many people do not face the security issues with web-based channels. Hence that implies a positive impact on adoption of E-Banking system. Therefore, people of Pakistan are satisfied with security services of web based banking.

4.9.3 Influence of Security Factors on ATM Channel

Customer retention and their engagement is one of the biggest challenges[50]. Currently in Pakistan several steps are taken in order to upgrade the security system of banking channels including ATMs. In this survey, we have asked multiple people if they had ever faced security issues while using any ATM and their answers are mapped Yes = 1 and No = 2 for statistical analyses which are summarized in below Table 4.7

Have you ever had Security concerns while using ATM Banking services platforms?

TABLE 4.7: Stats for Security Concerns While Using ATM Based Banking System

Frequency	**Percent**
Yes	79 (72.5)
No	30 (27.5)
Total	109 (100.0)

Above statistics show that 79 out of 109 respondents face the security concerns while using ATMs with 72.5%. Unfortunately, this is a huge number. While only 30 people do not face any security challenge. Below security concerns are listed upon ATM usage:

1. Theft & Robbery

2. Skimming

4.9.4 Summary of Security Issues Influencing the Adoption of E-Banking Channels

It is summarized from above analyses that security factor plays a major role in adopting the E-banking channels. In Pakistan, majority of the people are facing security issues because of which people are hesitant to adopt the digital system of banking. This may be one of the reasons why older people are adopting it since the interaction with the younger generation and their feedback place an important role in making decisions. This makes us lagging behind the overall world outside.

4.10 User Friendliness Factors Impacting the Adoption of E-banking Channels

1. Mobile App
2. Web based Channel
3. ATM

In this section the answers to the **"How satisfied you are with Mobile App services (User Friendliness)?"** are mapped against below scale for easy statistical analyses:

- Very Dissatisfied = 1
- Dissatisfied = 2
- Neutral = 3
- Satisfied = 4
- Very dissatisfied = 5

4.10.1 Influence of User Friendliness Factors on Mobile App Banking

User friendliness play an important role in any App for customer engagement and retention both. A user friendly app makes the customer journey easy to learn, use and understand[51]. Since the digital system is entirely computer operated, it is necessary that customer feels engaged and experiences a smooth journey on each session. One of the main factor that can influence any customer from adopting the digital banking through mobile app is "user friendliness".

It was asked from the users that how satisfied they are with User friendliness of their mobile banking app and answers were mapped as below for statistical analyses through SPSS version 25.0. Below Table 4.8 shows the statistics of answers upon asking the level of satisfaction in terms of user friendliness.

How satisfied you are with Mobile App services (User Friendliness)?

TABLE 4.8: Stats for Rating of User Friendliness While Using ATM Based Banking System

Rating	Frequency	Percent
1	8	7.3
2	17	15.6
3	13	11.9
4	53	48.6
5	18	16.5
Total	**109**	**100.0**

Above Table 4.8 shows that the 18 number of respondents are very satisfied and 53 respondents are satisfied. Whereas, 13 respondents are with the Neutral opinion. However, 17 respondents are dissatisfied and remaining 8 are very dissatisfied. From this statistical data it is analyzed that majority of the respondents are satisfied total 71 in number. However, only few have negative experience with user friendliness of the Mobile App.

4.10.2 Influence of User Friendliness Factors on Web-based Channels

Below Table 4.9 shows the statistics shows graphical representation when it

was asked from the digital banking channels that how satisfied they are with the user experience on web based channels.

How Satisfied you are with Web Based Internet banking in terms of User Friendliness?

SPSS version 25.0 was used to perform descriptive analyses for the above data.

TABLE 4.9: Stats for Rating of User Friendliness While Using Web Based Banking System

Rating	Frequency	Percent
1	4	3.7
2	16	14.7
3	24	22.0
4	53	48.6
5	12	11.0
Total	**109**	**100.0%**

It is observed that the 12 respondents out of 109 respondents are very satisfied from the user friendliness of the web based channels and 53 respondents out of 109 respondents are satisfied. We can consider this category as satisfied overall with the total percentage of 59%. However, on the other hand 24 respondent had the Neutral point of view in this regard. Further, 20 respondents are very dissatisfied and dissatisfied in total with the percentage of 18.4% out of all.

From this statistical data we can conclude that most of the people who participated in this survey are satisfied from user journey of web based users.

4.10.3 Influence of User Friendliness Factors on ATM Channels

ATMs are one of the most common channel for digital banking system[52].In Pakistan, day by day ATMs are becoming widely used but question is that are they fully adopted or there are some factors which limit the use of ATMs? In this part of the study, user friendliness is checked by asking the level of satisfaction they associate with ATM user journey. Below Table 4.10 shows the statistics for the user friendliness of ATM channel.

How satisfied you are with ATM platform in terms of User Friendliness?

The above Table shows that about 21 respondents are very satisfied and 61 re-

TABLE 4.10: Stats for Rating of User Friendliness While Using ATM

Rating	Frequency	Percent
1	4	3.7
2	11	10.1
3	12	11.0
4	61	56.0
5	21	19.3
Total	**109**	**100.0**

spondents are satisfied with the user friendliness of the ATM channel. While 12 respondents out of 109 respondents have neutral response and 4 respondents out of 109 respondents are very dissatisfied while 11 are dissatisfied. Which shows that 87.3% of respondents out of 109 respondents experience a good user journey while others are of neutral and 13.8% are dissatisfied. Hence, according to this survey customers are happy with the user journey of different banking ATMs and it is a positive aspect.

4.11 Customer Services Impacting the Adoption of E-banking Channels

1. Mobile App
2. Web based Channel
3. ATM

4.11.1 Customer Service Impact on Mobile App Channel

The studies state that there is a direct relationship of customer service with adoption of E-banking channels[53]. The level of satisfaction is directly impacting the number of people adopting the Mobile App for banking. Customer service may include how a customer is treated when he lodges the complaint and how fast his/her reported issues are being resolved. Below are statistical analysis using

SPSS Version 25.0 when asked how satisfied you are with the customer service while using the Mobile app? The Table 4.11 is scaled and mapped as per the below details and shows the stats

1. Excellent = 5
2. Good = 4
3. Average = 3
4. Poor = 2
5. Very poor = 1

TABLE 4.11: Stats for Rating of Customer Service While Using Mobile App

Rating	**Frequency**	**Percent**
1	3	2.8
2	52	47.7
3	33	30.3
4	12	11.0
5	9	8.3
Total	**109**	**100.0**

Above levels are mapped against the numerals for statistical analyses in SPSS. According to the above data mapped, 52 out of 109 respondents rate the level of customer as poor and 3 respondents rate the level of customer service as very poor. While, 33 respondents rated average. However, 12 out of 109 respondents and 9 out of 109 respondents rated good and excellent customer service respectively.
Collectively concluding, 50.5% of the population that participated is rating the Mobile App banking customer service provided as poor. This is almost half of the respondent's percentage participated and is not a good number. This means only 19.3% targeted population are satisfied with the customer service. This may result in bad experiences for the customers. Customers experience and how their opinion and suggestions are given priority as it is one of the main factors which allows a person to fully adopt a particular digital banking channel. This impacts

the adoption if Mobile App hugely.

About 44 out of 109 respondents switched the Mobile banking App due to poor customer services.

4.11.2 Customer Service Impact on Web based Channels

Customer service refers how an organization assists t is customers whenever they face any type of issue [54]. It involves any kind of troubleshooting, registering the complaints and their timely resolution. Same as mobile App, customer service with respect to web based channel is equally important. Below are statistics when people were asked about how they would rate the customer service if they ever experienced any issue while using web based channels.

How would you rate the level of customer service provided by Web Based Internet Banking services?

TABLE 4.12: Stats for Rating of Customer Service While Using Web-Based Banking

Rating	Frequency	Percent
1	1	0.9
2	38	34.9
3	34	31.2
4	26	23.9
5	10	9.2
Total	**109**	**100.0**

Above stats in Table 4.12 show that, 38 out of 109 respondents categorized the service of customers while using web-based channels as poor and one of them as very poor which is 35% out of all. However, 31.2% people rated average. Only 26 out of 109 respondents rated the customer service of web based channels as good and 10 respondents as very good.

The findings state that the customers are not happy with the assistance that any organization provides while using web based E-banking services.

4.11.3 Customer Service Impact on ATMs

ATMs are the most convenient form of the digital banking. Below are the findings in Table 4.13 upon asked how would they rate the customer services if they face any issue while using ATMs.

How would you rate the level of customer service provided by ATM Banking services? The above statistics state that the 40 respondents out of

TABLE 4.13: Stats for Rating of Customer Service While Using ATM

Rating	Frequency	Percent
1	2	1.8
2	40	36.7
3	36	33.0
4	21	19.3
5	10	9.2
Total	**109**	**100.0**

109 respondents marked the rate of customer service while using the ATMs to poor and 2 respondents marked as very poor. However, 36 respondents find the customer service as average while 21 and 10 respondents out of 109 respondents marked the customer service as good and excellent respectively.

In this case, customers are also not satisfied with the current situation of the assistance that organizations are providing to the ATM users. Hence, this factor impacts the adoption of ATMs.

4.12 Age Wise Analysis (Age group 25-34)

4.12.1 Security Factors Influencing Age Group (25-34) to Adopt Mobile Banking Apps, ATMs & Web based Banking Channels in Pakistan

4.12.1.1 Mobile App

From the age wise analysis, it is resulted that the most usage of digital banking is

by the age group starting from 25 years to 34 years.
Below are the statistical analysis for this age group with respect to each security factor that is impacting the adoption of digital banking channels.

Have you ever had Security concerns while using Mobile App Banking services platforms?

TABLE 4.14: Stats for Security Concerns While Using Mobile App Banking (25-35 years)

Response	**Frequency**	**Percent**
Yes	13	26.53
No	36	73.47
Total	**49**	**100.0**

4.12.1.2 Web Based Banking Channels

As this age group is mostly familiar with the banking channels, despite web based channels being very uncommon among the people it is mostly adopted by the age group of 25-34 of years.

Below are the statistics if this age group is satisfied with the security controls of this channel.

Have you ever had Security concerns while using Web Banking services platforms?

TABLE 4.15: Stats for Security Concerns While Using Web Based Banking (25-35 years)

Response	**Frequency**	**Percent**
Yes	15	29.2
No	34	70.8
Total	**49**	**100.0**

4.12.1.3 ATMs

Below Table 4.16 show that 9 out of 49 frequent users face security concerns while others feel safe.

Have you ever had Security concerns while using ATMs services platforms?

TABLE 4.16: Stats for Security Concerns While Using ATMs (25-35 years)

Response	Frequency	Percent
Yes	9	18.4
No	40	81.6
Total	**49**	**100.0**

4.12.2 User Friendliness Factors Influencing Age Group (25-34) to Adopt Mobile Banking Apps, ATMs & Web Based Banking Channels in Pakistan

4.12.2.1 Mobile App

In this part of analysis, it is analyzed that how user-friendliness of a certain digital banking platform impacts this age group. Below statistics were obtained in case of mobile banking.

How satisfied you are with Mobile App services (User Friendliness)?

TABLE 4.17: Stats for User Friendliness While Using Mobile Apps (25-35 years)

Responses	Frequency	Percent
Very dissatisfied	3	6.1
Dissatisfied	5	10.2
Neutral	6	12.2
Satisfied	27	55.1
Very satisfied	8	16.3
Total	**49**	**100.0**

4.12.2.2 Web Based Banking Services

Young people belonging to age group 25-34 years are much involved with technology. User friendliness defines the easiness one individual feels while using any digital banking channel.

Below are the statistics that show how satisfied this age group is with the interactive digital banking platforms. **How satisfied you are with Web based Banking services (User Friendliness)?**

TABLE 4.18: Stats for User Friendliness While Using Web Based Banking (25-35 years)

Responses	**Frequency**	**Percent**
Very dissatisfied	0	0.0
Dissatisfied	8	16.3
Neutral	16	32.7
Satisfied	21	42.9
Very satisfied	4	8.2
Total	**49**	**100.0**

4.12.2.3 ATMs

ATMs are the most important and common platform of the digital banking. With the passage of time banking organizations have improved their user interactivity. Below table 4.19 show the satisfaction level of age group 25-34. **How satisfied you are with Mobile App services (User Friendliness)?**

TABLE 4.19: Stats for User Friendliness While Using ATMs (25-35 years)

Responses	**Frequency**	**Percent**
Very dissatisfied	1	2.0
Dissatisfied	3	6.1
Neutral	4	8.2
Satisfied	33	67.3
Very satisfied	8	16.3
Total	**49**	**100.0**

4.12.3 Customer Service Factors Influencing Age Group (25-34) to Adopt Mobile Banking Apps, ATMs & Web Based Banking Channels in Pakistan

4.12.3.1 Mobile App

Young users may have more expectations for the quality of customer services specially while using mobile apps. They value responsive customer care. Below Table 4.20 show the statistics when the age group 25-34 years in Pakistan were asked how they would rate the level of customer service in Pakistan.

How would you rate the level of customer service provided by Mobile App?

TABLE 4.20: Stats for Customer Services While Using Mobile Apps (25-35 years)

Response	Frequency	Percent
1	1	2.0
2	19	38.8
3	15	30.6
4	9	18.4
5	5	10.2
Total	**49**	**100.0**

4.12.3.2 Web Based Banking

The quality of customer service may vary from platform to platform of digital banking. Customer service defines how approachable the customer representatives of a financial organization are?

How would you rate the level of customer service provided by Mobile App?

TABLE 4.21: Stats for Customer Services While Using Web Based Banking (25-35 years)

Response	Frequency	Percent
1	0	0.0
2	17	34.7
3	13	26.5
4	16	32.7
5	3	6.1
Total	**49**	**100.0**

4.12.3.3 ATMs

Below Table 4.22 show how the young users of ATM rate the customer service provided when they face any issue.

TABLE 4.22: Stats for Customer Services While Using ATMs (25-35 years)

Response	Frequency	Percent
1	0	0.0
2	19	38.8
3	16	32.7
4	9	18.4
5	5	10.2
Total	**49**	**100.0**

4.13 Usage Wise Analysis (Frequently)

Below analysis have been done on the basis of daily and weekly usage that are considered as frequently used.

Total 87 respondents used the digital banking services on daily and weekly basis.

4.13.1 Security Factors Influencing Frequent Users of Digital Banking in Pakistan to Adopt Mobile Banking Apps, ATMs & Web Based Banking Channels in Pakistan

4.13.1.1 Mobile App

Below (table 4.23 are the statistics that show the number of people that use Mobile App on daily and weekly basis that is considered as frequently used. Hence below stats depict that how unsafe people safe while using mobile banking app. We can see that maximum number of people feel safe while using e-banking systems.

Have you ever had Security concerns while using Mobile App e-banking services platforms?

TABLE 4.23: Stats for Security Services While Using Mobile Apps (Frequent Users)

Responses	Frequency	Percent
Yes	35	40.2
No	52	59.8
Total	**87**	**100.0**

4.13.1.2 Web Based Banking

Below (Table 4.24) are the statistics that show maximum number of frequent users are satisfied and feel safe while using web based banking.

TABLE 4.24: Stats for Security Services While Using Web Based Banking (Frequent Users)

Responses	Frequency	Percent
Yes	25	28.7
No	62	71.3
Total	**87**	**100.0**

4.13.1.3 ATMs

ATMs are one of the common and most used platform of the digital banking system. It is very important for the frequent users to feel safe while using ATMs.

Below (Table 4.25) are the statistical analysis for the people using ATMs on frequent basis.

TABLE 4.25: Stats for Security Services While Using ATMs (Frequent Users)

Responses	Frequency	Percent
Yes	25	28.7
No	62	71.3
Total	**87**	**100.0**

4.13.2 User Friendliness Factors Influencing Frequent Users of Digital Banking in Pakistan to Adopt Mobile Banking Apps, ATMs & Web Based Banking Channels in Pakistan

4.13.2.1 Mobile App

User friendliness is one of the most important factor that influence the adoption of any platform. Below Table 4.26 statistics show how frequent users of mobile banking app feel in aspect of user friendliness. **How satisfied you are with Mobile App services (User Friendliness)?**

TABLE 4.26: Stats for User Friendliness While Using Mobile App (Frequent Users)

Responses	Frequency	Percent
Very dissatisfied	6	6.9
Dissatisfied	13	14.9
Neutral	13	14.9
Satisfied	41	47.1
Very satisfied	14	16.1
Total	**87**	**100.0**

4.13.2.2 Web Based Banking

Web based banking is most uncommon but still the frequent users were asked how do they rate the user friendliness of web based banking.

Hence, below stats in Table 4.27 show that most of the frequent users are satisfied with the interactive user journey.

TABLE 4.27: Stats for User Friendliness While Using Web Based Banking (Frequent Users)

Responses	**Frequency**	**Percent**
Very dissatisfied	1	1.1
Dissatisfied	12	13.8
Neutral	20	23.0
Satisfied	42	48.3
Very satisfied	12	13.8
Total	**87**	**100.0**

4.13.2.3 ATMs

User friendliness include clear instructions throughout the user journey. User should not be in lot of technical jargon. Users that user ATM on frequent basis should be satisfied with the interactive experience.

In this survey, below stats were obtained when frequent users were asked how satisfied they are with the user friendliness of the ATMs. Most of the users are happy with the user journeys.

TABLE 4.28: Stats for User Friendliness While Using ATMs (Frequent Users)

Responses	**Frequency**	**Percent**
Very dissatisfied	2	2.3
Dissatisfied	8	9.2
Neutral	9	10.3
Satisfied	49	56.3
Very satisfied	19	21.8
Total	**87**	**100.0**

4.13.3 Customer Service Factors Influencing Frequent Users of Digital Banking in Pakistan to Adopt Mobile Banking Apps, ATMs & Web Based Banking Channels in Pakistan

4.13.3.1 Mobile App

Customer services include the answering of queries, lodging the complains, quick solutioning of the customer reported issues etc. while using mobile app by the frequent users out of 109 respondents' maximum users were unhappy with the services provided by their banking organization.

Below stats Table 4.29 summarizes the above.

TABLE 4.29: Stats for Customer Services While Using Mobile App (Frequent Users)

Response	Frequency	Percent
Very Poor	3	3.4
Poor	29	33.3
Average	28	32.2
Good	18	20.7
Excellent	9	10.3
Total	**87**	**100.0**

4.13.3.2 Web Based Banking

Detailed knowledge-based help centers are one of the ways the quality of customer service of web based banking can be implemented.
Below stats in Table 4.30 is showing when frequent users of web based banking were asked how would they rate the level of customer services.

TABLE 4.30: Stats for Customer Services While Using Web Based Banking (Frequent Users)

Response	**Frequency**	**Percent**
Very Poor	0	0.0
Poor	29	33.3
Average	29	33.3
Good	19	21.8
Excellent	10	11.5
Total	**87**	**100.0**

4.13.3.3 ATMs

Banking organizations should ensure that the customer services are accessible to the users/customers 24/7 with quick closure of their issues. In this aspect, below statistics show that maximum number of frequent users of the app are of satisfied with the ATM customer services provided.

TABLE 4.31: Stats for Customer Services While Using ATMs (Frequent Users)

Response	**Frequency**	**Percent**
Very Poor	1	1.1
Poor	31	35.6
Average	26	29.9
Good	21	24.1
Excellent	8	9.2
Total	**87**	**100.0**

Chapter 5

Results & Analysis

5.1 Reliability Test

It is a statistical measure that ensures the stability and consistency under various conditions. It can be performed by Cronbach's alpha.
Cronbach Alpha test is performed through SPSS 25.0 software and values are improve by deleting the items. According to the studies it is suggested that value of alpha should be more than 0.6 [55]. Below Table 5.1 shows the values of alpha against Cronbach Alpha test. It is clearly observed that the values are within limits and data is reliable.

Table 5.1: Cronbach's Alpha Test

Variables	**SPSS Name**	**No. of Items**	**Alpha Values**
Customer Services	CS	6	0.621
Security Factors	SF	6	0.778
User Friendliness	UF	6	0.625

Security factors have highest value of alpha i.e 0.778. Customer services obtained 0.621 and total 6 items are included in this variable. Whereas, user friendliness also included 6 items with the values of alpha as 0.625.From the above table it

can be seen that Cronbach alpha values for all variables are higher than 0.6 and are in acceptable value of reliability.

5.2 Pearson's Correlation Analysis

Pearson test also known as Pearson's r is commonly used to assess the relationship between two variables [56]. The direction and strength between two variables is evaluated through Pearson test. The range of Pearson's r must be between -1 and +1. If the Pearson's r is between +0.5 to +1 the relation is categorized as positive correlation among different variables whereas if the value of r is between -1 to -0.5, there is a negative correlation among the variables [57]. Values that are far from zero show a strong relationship whereas values near to zero are considered as weak relationship.

In this section, Pearson's test is conducted to check H2 and H3 where it states that User Friendliness has a positive relationship with adoption of e banking and Customer Services (CS) have a positive and significant relationship with adoption of e banking. Hence, after conducting the results for both variables it is identified that UF and CS have a positive and significant relationship with the R-value of 0.360** and a p-value less than 0.01. Moreover, it is seen that SF has r value of -0.547** and -0.288**. Below Table 5.2 shows the overall results conducted on SPSS. Hence, hypothesis H2 and H3 are validated and is marked as accepted.

Table 5.2: Statistics of Security Factors

Factors	UF	CS	SF
UF	1		
CS	0.360**	1	
SF	-0.547**	-0.288**	1

We can see from above table that SF has a negative impact on UF and CS that shows security factors negatively impact the adoption e-banking channels in Pakistan.

This test suggests that UF and CS are positively correlated to each other. If customers face are happy with user friendliness ultimately they will be happy with the customer services as well.

5.3 Regression Analysis

Regression analysis study the statistical procedure that calculates the change in dependent variable with respect to independent variable from given/observed set of data. In this study, Customer Services (CS) are identified to be an independent variable whereas User friendliness is a dependent variable. Hence, we have performed regression analysis to check how CS impacts UF. Below Table 5.3 shows the summary of the results conducted on SPSS.

TABLE 5.3: Regression Analysis

User Friendliness			
Predictors	β	R^2	p
Customer Services	0.325	0.129	0.000

From the regression analysis results, it is analyzed that CS (independent variable) shows a significant and positive relationship with UF (dependent variable).

Hence, the value of p is less than 0.01 in the above test which concludes that the increase in CS will ultimately impact UF. Value of beta is equivalent to 0.325 which lies between the acceptable ranges of beta from 0 to 1 or 0 to -1. The positive values of beta shows the relationship between UF and CS is positive.

Alternatively, any decrement in CS will cause a decrease in UF as well. The value of R square shows the degree of variability that is 0.129 in this result. Hence, the independent variable CS cause a change of 13% in the dependent variable UF. Conclusively, hypothesis H2 & H3 are accepted and validated.

5.4 Impact Analysis of Security Factors

Security of any e banking platform is the most critical factor. It ensures all security protocols that a financial organization should meet. H1 states that security has a positive and significant impact on adoption of e banking system.

Table 5.4 shows the overall response from the respondents when asked if they have ever had security concerns while using any e banking services. Approximately 54% people answered yes and 46% people were observed to say that they didn't observed any issue related to security.

TABLE 5.4: Statistics of Security Factors

Channel	YES (%)	NO (%)
ATM	59.6	40.4
Mobile App	72.5	27.5
Web-based banking	29.4	70.6
Total Percentage	53.83	46.17

It is clearly observed from above table that majority of the customers face security issues while using different e banking channels. Which implies a negative impact on adoption of e banking. Security Factors (SF) also have negative correlation with other factors i.e CS and UF with the significant value less than 0.01. Pearson's correlation test was conducted to check the correlation of SF with UF and CS. It is identified that SF has a negative value of Pearson's r which indicates the negative relationship with UF and CS. Above table 5.2 shows a summary of correlation.

Security factor being and independent has a direct impact on adoption of e banking system. Hence, according to the above summary of factors it is concluded that H1 is rejected as security is negatively impacting the adoption of e banking. Conclusively, Security Factors (SF) has a negative impact and significance on adoption e banking. Customers were also asked to if they ever had experienced any theft or fraud related events while using any e banking channel. It was observed that 81 respondents responded with yes that is more than 50% of the people. Security

Factors are the paramount components of any financial organization due to several critical reasons.

5.5 Summary of Accepted and Rejected Hypothesis

All build up hypothesis in this study have been accepted or rejected under different tests and analysis. In this study, all responses are collected through designed questionnaire according to the formulated hypothesis. Tests are conducted through SPSS that are relevant to hypothesis statements. Upon conducting different tests the decisions were undertaken. Below is the summary of hypothesis.

H_1: Security Factors have a positive and significant relationship in adoption of e banking system. **(REJECTED)**

H_2: Customer Services have a positive and significant relationship in adoption of e banking system. **(ACCEPTED)**

H_3: User Friendliness have a positive and significant relationship in adoption of e banking system. **(ACCEPTED)**

Chapter 6

Conclusions and Recommendations

6.1 Conclusions

In this research study, below analysis are performed by using SPSS version 25.0 tool.

1. Response Rate Analysis
2. Analysis of Usage of E-banking channels in Pakistan
3. Analysis of security factors impacting the adoption of digital channels in Pakistan
4. Analysis of user friendliness factor impacting the adoption of digital channels in Pakistan
5. Analysis of customer services impacting the adoption of digital channels in Pakistan
6. Analysis of frequent users and their adoption of digital channels
7. Reliability Test
8. Normality Test

9. Pearson's Correlation Analysis
10. Regression Analysis
11. Impact Analysis of Security Factors

As per the usage analysis, out of 109 respondents 40 users use the digital banking on daily basis and 47 users use on monthly basis. Surprisingly, most of the users of digital banking belong to the age group of 25-34 years. This generation may be titled as "tech savvy generation". As this age group is grown up in a digital era. In general, age group of 25-34 is more familiar with the technology so naturally they adopt the more digital ways to function their daily life chores.

It is more convenient for this group of age to use digital channels as they are mostly busy during their working hours. Hence, they do not visit the banks physically rather they tend to perform complex tasks on a single click. Young users of age group 25-34 are most likely to use the Mobile Apps for online shopping which concludes that they experience a consistent financial experience. One of the main factor is cost saving. Younger age group can perform transaction on a single click on any platform this saves cost by not travelling to bank physically. Hence it is concluded from this analysis that most of the users of digital banking are frequent users of age group 25-34.

When using any digital channel it is very important to ensure the **security measures** of the particular system. In this research study, it is found that 65 out of 109 mobile app users feel unsafe while using mobile app banking. While only 32 users of web based banking users feel unsafe. The ATM users are also concerned about security factors. It found in this survey that 79 ATM users feel unsafe.

M.Afroze et al. state that it is very important for any banking organization to protect the financial information of the customers in order to ensure the better usage of digital banking [58]. Security is very fundamental to banking organization. In this survey analysis, it is concluded that security implementation in Pakistan is very weak due to which people resist to adopt the digital banking in Pakistan.

People of Pakistan feel unsafe while using Mobile Apps and ATMs while they feel safe while using web based banking. One of the factor may be that web based banking are one of the most uncommon platform for banking and people are not much aware. People of Pakistan have several security concerns as well like skimming, fraudulent activities etc.

Digital banking users when joining any banking organization trust the security measures but in Pakistan people are very helpless as there is a need to use the digital banking on one and on other hand people feel unsafe which refrain the new users to adopt the digital banking services. Hence, current security concerns negatively affects the adoption of digital banking services in Pakistan.

A. D states in her study that **user friendliness** and an interactive user journey for any user is very important while using digital channels [59]. User interactivity directly impacts the customer experiences. In this survey analysis, majority of respondents ae happy with the smooth and interactive user journeys. E-banking users find the logical and easy process and navigation process.

Customer service is one of the most important factor for an organization while providing any product or services. In this survey analysis, 53 respondents out of 109 respondents rated the customer services to poor while using mobile banking apps while 53 respondents also rated poor customer services of web based banking. However, 61 respondents rated poor customer services of ATM channels. It is very surprising to get this number of dissatisfaction from the daily users. Hence, it is concluded that overall, people of Pakistan are not satisfied with the customer services provided by banking organizations.

R.A Mosa explains in his study that customer services directly impacts the usage and adoption of E-banking system[60]. There should be good feedback mechanism for customers to lodge the complaints. After lodging of complaints customer representatives should be able to resolve the issues on urgent basis.Therefore, from this study it is concluded that people of Pakistan are not satisfied with customer

services provided hence it is negatively impacting the adoption of E-banking system. **Gender** plays and important role in adoption of e-banking system as males tend to use technology more often than females. That is because males have more exposure to outside world if communication then females.

In this survey analysis it was identified that 56 females participated however, 53 males participated. Males and females equally were not satisfied with the security measures of the digital banking in Pakistan while both genders equally responded that they have a good interactive user friendliness experience. Similarly, males and females respondents in this survey analysis were also not satisfied with the overall security measures of the ATM system. Hence, it is concluded that males and female respondents in this survey are not satisfied with factors i.e. security and customer services. This negatively impacts the adoption of E-banking system.

Analysis for age group 25-34 years was also performed. It was identified that majority of the people if this age group are satisfied with the security concerns of different digital banking channels whereas the concerns in this case remains same. People of this age group still feel unsafe while using digital banking platforms. However, majority of this age group is also satisfied with user friendliness. One of the main reason may be because this age group is more familiar with technology and they understand the user journeys and navigations of the digital services easily. Whereas, majority of this age group is not satisfied with the customer services provided. This is due to irresponsive attitude of customer representatives.

If we talk about the usage **wise analysis (frequent basis)** we found that see that maximum number of people feel safe while using e-banking systems whereas majority people are also have good experience with user interface of different channels. However, majority of the frequent users are not happy with the customer services provided by the banking organizations. This concludes that the factor of customer service negatively influences the adoption of digital banking channels.
User Friendliness (UF) and Customer Services (CS) are directly impacting the adoption of e banking system. Both factors have a positive relationship with each

other that means if one of them negatively impacting the other one will automatically impacted. Hence, both factors i.e UF and CS directly impact the perceived ease of use and perceived usefulness respectively. Their impact is indirectly dependent upon the adoption of e banking system ultimately. The main conclusion derived is that UF and CS controls the TAM indirectly whereas SF directly impacts TAM. Due to the involvement of TAM, successful implementation of technology is possible. The positive attitude of users make the implementation of technology possible.

Overall, this study helps to provide a deep understanding of influencing factors that impact the adoption of e banking system. It helps any financial organization to devise the policies and procedures in order to understand the customer needs.

6.2 Recommendations

With the passage of time, world is growing digitally. It streamlines the physical banking activities into digital processes and eliminates the manual processes.

It saves cost and help users to perform transactions in a faster way. This survey concludes that maximum users of digital banking in Pakistan are not satisfied with the security factors and customer services offered by different banking organization. While the interactive and smooth user journeys are offered by different banks for their various banking channels this makes the majority users of banks in Pakistan are happy.

Ro-bust process of security system must be implemented by the banking organizations in Pakistan. Multi-factor authentication system should be ensured where users should be allowed to register the pin codes on each log in session. Biometric verification system should be implemented on different digital banking channels to ensure the good security system. Proper security measures should be taken if any fraudulent activity is observed. Banking organization should use standard encryption process by imposing SSL certificates over each digital channel. Any un-authorized logins or phishing activities should be actively reported and action

should be taken accordingly. Backups for after every short interval of time should be taken for critical data so that data may not be lost. International standards of security should be maintained properly to ensure security protocols.

Easy and intuitive designs and workflows of different e-banking channels must be implemented to lodge the complaints. 24/7 availability of the customer representative should be implemented. A detailed frequently asked questions sections should be developed on each digital banking platform which should be easily accessible to the customers. Customers support should be offered through different channels like emails, toll free numbers, live chats and social media. A feature on in-app messaging also called chat bot should be made available so that customers can ask for help and report issues immediately. Customers should be informed prior to any system degradation on time and services should be resumed as soon as possible.

Bibliography

[1] G. B. Gorton *et al.*, "Nber working paper series making money," 2022.

[2] M. A. Khan and H. A. Alhumoudi, "Performance of e-banking and the mediating effect of customer satisfaction: A structural equation model approach," *Sustain.*, vol. 14, no. 12, 2022.

[3] H. Ji, "International currency competition under the background of digitization and its international enlightenment to rmb," *Acad. J. Bus. Manag.*, vol. 4, no. 14, pp. 93–97, 2022.

[4] Santhosh and K. Raj, "Normalising the digital currency as an innovation in digital banking practice," *East Asian J. Multidiscip. Res.*, vol. 1, no. 6, pp. 1045–1058, 2022.

[5] B. Chaimaa, E. Najib, and H. Rachid, "E-banking overview: Concepts, challenges and solutions," *Wirel. Pers. Commun.*, vol. 117, no. 2, pp. 1059–1078, 2021.

[6] P. Rana and D. Pandey, *Challenges and Issues in E-Banking Services and Operations in Developing Countries*. January 2015.

[7] A. Fatima, "E-banking security issues-is there a solution in biometrics?," *J. Internet Bank. Commer.*, vol. 16, no. 2, 2011.

[8] P. Weekly, "E-banking: Challenges and," *Volume 38, Number 51*, pp. 5377–5381, 2015.

[9] S. J. Barnes and B. Corbitt, "Mobile banking: concept and potential," *Int. J. Mob. Commun.*, vol. 1, no. 3, pp. 273–288, 2003.

[10] G. Angelakopoulos and A. Mihiotis, "E-banking: Challenges and opportunities in the greek banking sector," *Electron. Commer. Res.*, vol. 11, no. 3, pp. 297–319, 2011.

[11] R. P. Sundarraj and J. Wu, "Using information-systems constructs to study online- and telephone-banking technologies," *Electron. Commer. Res. Appl.*, vol. 4, no. 4, pp. 427–443, 2005.

[12] A. Sulaiman, L. C.H, and A. WEE, "Prospects and challenges of e-banking in malaysia," *Electron. J. Inf. Syst. Dev. Ctries.*, vol. 22, no. 1, pp. 1–11, 2005.

[13] V. Maugis *et al.*, "Global e-readiness—for what? readiness for e-banking," *Inf. Technol. Dev.*, vol. 11, no. 4, pp. 313–342, 2005.

[14] R. F. Malaquias and Y. Hwang, "An empirical study on trust in mobile banking: A developing country perspective," *Comput. Human Behav.*, vol. 54, pp. 453–461, 2016.

[15] R. A. Alsharida, M. M. Hammood, and M. Al-Emran, "Mobile learning adoption: A systematic review of the technology acceptance model from 2017 to 2020," *International Journal of Emerging Technologies in Learning (iJET)*, vol. 16, no. 5, pp. 147–162, 2021.

[16] N. Al-Qaysi, N. Mohamad-Nordin, and M. Al-Emran, "Employing the technology acceptance model in social media: A systematic review," *Education and Information Technologies*, vol. 25, no. 6, 2020.

[17] S. Sharma, M. Govindaluri, S. Al-Muharrmi, and A. Tarhini, "A multi-analytical model for mobile banking adoption: A developing country perspective," *Rev. Int. Bus. Strateg.*, vol. 27, no. 1, pp. 222–237, 2017.

[18] N. Popoola, "The effect of trust in adoption of internet banking: A case study of nigeria," *International Journal of Economics, Business and Management*, vol. 1, no. 2, pp. 19–24, 2013. [Online]. Available: http://www.academicresearchjournals.org/IJEBM/PDF%202013/November/POPOOLA.pdf.

[19] P. Tobbin, "Towards a model of adoption in mobile banking by the unbanked: A qualitative study," *Info*, vol. 14, no. 5, pp. 74–88, 2012.

[20] L. S. Goldberg, "Understanding banking sector globalization," *IMF Staff Pap.*, vol. 56, no. 1, pp. 171–197, 2009.

[21] A. A. Gill, R. H. Ansari, K. Akram, and M. W. Tufail, "Application of cognitive motivational relational theory to examine the influence of e-banking quality factors on customer loyalty," *J. Account. Financ. Emerg. Econ.*, vol. 7, no. 1, pp. 241–249, 2021.

[22] L. Pio, L. Cavaliere, and S. Bhatia, "Digital technologies' implementation within financial and banking system during socio distancing restrictions – back to the future.pdf," *International Journal of Advanced Research in Engineering and Technology*, vol. 11, no. 6, pp. 307–315, 2020.

[23] J. R. K. Kamdjoug, A. O. N. Teutio, U. T. Tchouanga, and J.-P. Gueyie, "Use of e-banking and customer e-engagement in developing countries: Case of nfc bank cameroon," *Theor. Econ. Lett.*, vol. 12, no. 05, pp. 1378–1406, 2022.

[24] Y. K. Nagar, "Impact of e-banking on customer preferences in private and public banks. a comparison between sbi and hdfc," 2021.

[25] V. Thi and K. Chi, "Examining factors affecting customers' intention to use e-banking in vietnam phân tích các nhân t tác ng n Ý nh s dng e-banking ca khách hàng vit nam," *Practitioners and Academia in the Banking Sector*, vol. 226, no. 09, pp. 46–56, 2021.

[26] E. Sepashvili and E. Sepashvili, "Digital chain of contemporary global economy: E-commerce through e-banking and e-signature," *Economic and Business Review*, vol. 11, no. 3, pp. 239–249, 2020.

[27] A. Tahtamouni, "E-banking services and the satisfaction of customers in the jordanian banks," *Journal of Science, Technology, and Policy Management*, vol. 14, no. 6, pp. 1037–1054, 2023.

[28] B. Almansour and S. Elkrghli, "Factors influencing customer satisfaction on e-banking services: A study of libyan banks," *International Journal of Technology Innovation and Management*, vol. 3, no. 1, pp. 34–42, 2023.

[29] A. J. Khan, N. Hanif, J. Iqbal, T. Ahmed, W. U. Hameed, and A. A. Malik, "Greening for greater good: investigating the critical factors for customer satisfaction with sustainable e-banking," *Environmental Science and Pollution Research*, 2023.

[30] M. A. Almaiah *et al.*, "Investigating the role of perceived risk, perceived security and perceived trust on smart m-banking application using sem," *Sustainability*, vol. 15, no. 13, pp. 1–17, 2023.

[31] B. Kaulu, "Factors influencing customers' intention to adopt e-banking: a tam and cybercrime perspective using structural equation modelling," 2024.

[32] D. K. Gautam and G. K. Sah, "Online banking service practices and its impact on e-customer satisfaction and e-customer loyalty in developing country of south asia-nepal," *SAGE Open*, vol. 13, no. 3, pp. 1–14, 2023.

[33] V. B. Prasad, "Factor affecting adoption of e-banking," *Asian Journal of Management and Commerce*, vol. 4, no. 1, pp. 242–245, 2023.

[34] J. R. Situmorang, "Comparing mobile banking and internet banking in indonesia based on technology acceptance mobile & security factor," *Journal of Economics*, vol. 13, no. 01, pp. 856–872, 2024.

[35] S. Singh and A. Sayeed, "Customer behavior regarding e-banking services in private sector banks: A case study in maihar city," pp. 0–5, 2024.

[36] D. P. S. Andrew, P. M. Pedersen, and C. D. McEvoy, *Research Methods and Design in Sport Management*. 2011.

[37] L. Busetto, W. Wick, and C. Gumbinger, "How to use and assess qualitative research methods," *Neurology Research and Practice*, vol. 2, no. 1, 2020.

[38] H. H. Alharahsheh and A. Pius, "A review of key paradigms: positivism vs interpretivism," *Global Academic Journal of Humanities and Social Sciences*, vol. 2, no. 3, pp. 39–43, 2020.

[39] M. M. Al-Ababneh, "Linking ontology, epistemology and research methodology," *Science and Philosophy*, vol. 8, no. 1, pp. 75–91, 2020.

[40] S. Turale, "A brief introduction to qualitative description: A research design worth using," *Pacific Rim International Journal of Nursing Research*, vol. 24, no. 3, pp. 289–291, 2020.

[41] S. Ahmad, S. Wasim, S. Irfan, S. Gogoi, A. Srivastava, and Z. Farheen, "Qualitative v/s. quantitative research- a summarized review," *Journal of Evidence-Based Medicine and Healthcare*, vol. 6, no. 43, pp. 2828–2832, 2019.

[42] D. Läkens, "Sample size justification," *Collabra Psychology*, pp. 1–32, 2022.

[43] J. R. Lindner and K. E. Dooley, "Journal of international agricultural and extension education: From the editors," *Journal of International Agricultural and Extension Education*, vol. 15, no. 2, p. 5, 2008.

[44] F. Farrokhi and A. Mahmoudi-Hamidabad, "Rethinking convenience sampling: Defining quality criteria," *Theory and Practice in Language Studies*, vol. 2, no. 4, pp. 784–792, 2012.

[45] Y. Sei, J. A. Onesimu, H. Okumura, and A. Ohsuga, "Privacy-preserving collaborative data collection and analysis with many missing values," *IEEE Transactions on Dependable and Secure Computing*, vol. 20, no. 3, pp. 2158–2173, 2023.

[46] M. G. G. Hatem, J. Zeidan and C. Moreira, "Normality testing methods and the importance of skewness and kurtosis in statistical analysis," *BAU J. - Sci. Technol.*, vol. 3, no. 2, 2022.

[47] A. J. Luther and S. Sumani, "The influence of demographic factors and financial literature on students' investment perceptions," *Int. J. Appl. Bus. Int. Manag.*, vol. 8, no. 2, pp. 26–39, 2023.

[48] R. H. G. X. L. Huang, Y. Huang and W. Cai, "Factors influencing returning migrants' entrepreneurship intentions for rural e-commerce: An empirical investigation in china," *Sustain.*, vol. 14, no. 6, 2022.

[49] G. R. J. A. V. M. B. S. K. Sasikala, C. Sharanya and E. N. Ganesh, "Design and implementation of bio signal platform using internet of things," in *AIP Conf. Proc.*, vol. 2463, 2022.

[50] L. Bharmal, "Use of biometric machine for security in atm system," pp. 2114–2117, 2022.

[51] M. A. Gul *et al.*, "Ease, availability, accessibility, reliability and user friendliness of internet to online banking customers," *Int. Res. J. Mod. Eng. Technol. Sci.*, vol. 4, no. 10, pp. 1670–1684, 2022.

[52] S. J. N. Gokhe and P. Thakur, "The power of e-banking on the use of banking facilities and clients happiness," vol. 7, no. 2, pp. 29–32, 2022.

[53] M. A. Bashir, M. A. Haque, A. Salamzadeh, and M. M. Rahman, "Customers' satisfaction of e-banking in bangladesh: Do service quality and customers' experiences matter?," *FinTech*, vol. 2, no. 3, pp. 657–667, 2023.

[54] A. Angusamy, C. J. Yee, and J. Kuppusamy, "E-banking: An empirical study on customer satisfaction," *Journal of Systems Management Sciences*, vol. 12, no. 4, pp. 27–38, 2022.

[55] G. Ursachi, I. A. Horodnic, and A. Zait, "How reliable are measurement scales? external factors with indirect influence on reliability estimators," *Procedia Econ. Financ.*, vol. 20, no. 15, pp. 679–686, 2015.

[56] J. Benesty, J. Chen, Y. Huang, and I. Cohen, "Optimal filters in the time domain," in *Springer Top. Signal Process.*, vol. 2, pp. 1–18, 2009.

[57] N. J. Gogtay and U. M. Thatte, "Principles of correlation analysis," *J. Assoc. Physicians India*, vol. 65, no. MARCH, pp. 78–81, 2017.

[58] M. Afroze, G. Abid, S. Rehman, and N. S. Elahi, "Impact of privacy and security on e-banking loyalty: Mediating role of customer satisfaction and moderation of reliability," *Industrial Higher Education*, vol. 3, no. 1, pp. 1689–1699, 2021. [Online]. Available: http://journal.unilak.ac.id/index.php/JIEB/article/view/3845.

[59] A. D, "A study of consumer awareness towards e-banking," *International Journal of Economics, Management, and Science*, vol. 5, no. 4, pp. 4–7, 2016.

[60] R. A. Mosa, "The influence of e-customer relationship management on customer experience in e-banking service," *International Journal of Academic Research in Business and Social Sciences*, vol. 12, no. 2, pp. 193–215, 2022.

Questionnaire

This Survey Form is designed to identify the gaps of E-banking system in Pakistan in comparison to International level. Which will help me to manage and suggest the ways out to eliminate these gaps.

Please tick the below options according to your answer.

Survey Questions

1. What is your age range?

   ☐ 18-24
   ☐ 25-34
   ☐ 35-44
   ☐ 45-54
   ☐ 55+

2. What is your gender?

   ☐ Male
   ☐ Female
   ☐ Other

3. How often do you use e-banking services?

   ☐ Daily
   ☐ Weekly
   ☐ Monthly
   ☐ Rarely
   ☐ Never

4. Which E-banking Type/Mode do you use more often?

☐ Mobile App ☐ ATMs

☐ Web-based Channels

5. Which e-banking services have you used in the recently?

☐ Online account management ☐ Mobile banking

☐ Bill payment ☐ ATM services

☐ Fund transfer ☐ All of above

6. How satisfied are you with the Mobile App services of e-banking you have used?

☐ Very satisfied ☐ Somewhat dissatisfied

☐ Somewhat satisfied ☐ Very dissatisfied

☐ Neutral

7. How satisfied you are with Mobile App services (User Friendliness?)

☐ Very satisfied ☐ Somewhat dissatisfied

☐ Somewhat satisfied ☐ Very dissatisfied

☐ Neutral

8. Have you ever faced any technical issues while using Mobile App?

☐ Yes ☐ No

9. If yes, then how often have you faced the technical issues?

☐ Every time ☐ Frequently

☐ Sometime ☐ Rarely

10. Have you ever had Security concerns while using Mobile App e-banking services platforms?

☐ Yes ☐ No

11. Do you think using Mobile App is safe?

☐ If No, What is your concern

12. Have you ever experienced fraud or identity theft related to Mobile App?

☐ Yes ☐ Not Sure

☐ No

13. How would you rate the level of customer service provided by Mobile App?

☐ Excellent ☐ Poor

☐ Good ☐ Very poor

☐ Average

14. In your opinion, what are the biggest drawbacks of Mobile App in comparison to physical banking?

☐ Security ☐ Customer service

☐ User interface ☐ All of above

☐ Features and functionality

15. How satisfied are you with the Web-based services of banking you have used?

☐ Very satisfied ☐ Somewhat dissatisfied

☐ Somewhat satisfied ☐ Very dissatisfied

☐ Neutral

16. How satisfied you are with Web-based services of in terms of User Friendliness?

☐ Very satisfied ☐ Somewhat dissatisfied

☐ Somewhat satisfied ☐ Very dissatisfied

☐ Neutral

17. Have you ever faced any technical issues while using Web-based services?

☐ Yes ☐ No

18. If yes, then how often have you faced the technical issues?

☐ Daily ☐ Rarely

☐ Weekly ☐ Never

☐ Monthly

19. Have you ever had Security concerns while using Web-based services of e-banking platforms?

☐ Yes ☐ No

20. What type of Security concern did you had while using Web-based services of e-banking?

☐

21. Have you ever experienced fraud or identity theft related to Web-based services of e-banking?

☐ Yes ☐ No

22. How would you rate the level of customer service provided by Web-based services of e-banking?

☐ Excellent ☐ Poor

☐ Good ☐ Very poor

☐ Average

23. In your opinion, what are the biggest drawbacks of Web-based services of e-banking in comparison to physical banking?

☐ Security ☐ Features and functionality

☐ User interface ☐ Customer service

☐ All of above

24. How satisfied are you with the ATM services you have used?

☐ Very satisfied
☐ Somewhat satisfied
☐ Neutral
☐ Somewhat dissatisfied
☐ Very dissatisfied

25. How satisfied you are with ATM in terms of User Friendliness?

☐ Very satisfied
☐ Somewhat satisfied
☐ Neutral
☐ Somewhat dissatisfied
☐ Very dissatisfied

26. Have you ever faced any technical issues while using ATM e-banking services?

☐ Yes
☐ No

27. If yes, then how often have you faced the technical issues?

☐ Every time
☐ Sometime
☐ Frequently
☐ Rarely

28. Have you ever had Security concerns while using ATM e-banking services platforms?

☐ Yes
☐ No

29. What type of Security concern did you had while using ATM e-banking services?

☐

30. Have you ever experienced fraud or identity theft related to ATM e-banking services?

☐ Yes ☐ No

31. How would you rate the level of customer service provided ATM e-banking services?

☐ Excellent ☐ Poor

☐ Good ☐ Very poor

☐ Average

32. In your opinion, what are the biggest drawbacks of ATM e-banking services in comparison to physical banking?

☐ Security ☐ Customer service

☐ User interface ☐ All of above

☐ Features and functionality