***ASSOCIAÇÃO DE POLITÉCNICOS DO NORTE* (APNOR)**

INSTITUTO POLITÉCNICO DE BRAGANÇA

Determinants of Digital Wallet in Pakistan using DOI Model: An Exploratory Research

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Final Dissertation submitted to *Instituto Politécnico de Bragança*

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Supervisor

Prof. Doutora Ana Paula Monte

***Bragança*, December 2023**

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Abstract

The current study was designed to identify the determinants of digital wallets usages in Pakistan using DOI Model. This is a descriptive and exploratory research using mostly primary quantitative data. Both primary and secondary data is collected to answer the research questions. Primary data was collected through a survey by questionnaire survey based on DOI model that has been explained theoretically in the literature review section. The questionnaire was based on the factors determined in the model that test variables like adoptability, trialability, relative advantage, compatibility, complexity, observability and perceived risk associated with the technology. The sample consist of both young and middle age people either employed in government sector, private job or in a business. The study results indicated that factors like relative advantage, compatibility, complexity and perceived risk are the most important determinants of e-wallets in Pakistan. People do not find E-Wallets compatible with their lifestyle and consider the procedures confusing and complex. The percentage of perceived risk is also found to be very high as people believe that their personal and financial information is not safe with these applications. The discussion reveals that despite of these determinants there is potential of growth for digital payment systems in developing countries. People are slowly and gradually becoming aware of the benefits associated with digital payment systems. The study results are particularly important for e-wallet service providers in developing countries as they can use these results to devise their business and market strategy accordingly. The study also provided some recommendations that can be used as key points while promoting E-Wallet services.

Keyword: Digitalization, E-Wallets, DOI Model, Determinants of E-wallets

Resumo

O presente estudo foi desenhado para identificar os determinantes do uso de carteiras digitais no Paquistão usando o modelo DOI. Trata-se de uma pesquisa descritiva e exploratória, utilizando principalmente dados quantitativos primários. Os dados primários e secundários foram coletados para responder às perguntas da pesquisa. Os dados primários foram coletados por meio de um levantamento por questionário baseado no modelo DOI que foi explicado teoricamente na seção de revisão da literatura. O questionário foi baseado nos fatores determinados no modelo que testam variáveis como adotabilidade, experimentalidade, vantagem relativa, compatibilidade, complexidade, observabilidade e risco percebido associado à tecnologia. A amostra é composta por jovens e pessoas de meia idade, empregados no setor governamental, privado ou em uma empresa. Os resultados do estudo indicaram que fatores como vantagem relativa, compatibilidade, complexidade e risco percebido são os determinantes mais importantes das carteiras eletrônicas no Paquistão. As pessoas não consideram as carteiras eletrônicas compatíveis com seu estilo de vida e consideram os procedimentos confusos e complexos. A percentagem de risco percebido também é considerada muito alta, pois as pessoas acreditam que suas informações pessoais e financeiras não estão seguras com esses aplicativos. A discussão revela que, apesar desses determinantes, há potencial de crescimento para os sistemas de pagamento digital nos países em desenvolvimento. As pessoas estão lenta e gradualmente se conscientizando dos benefícios associados aos sistemas de pagamento digital. Os resultados do estudo são particularmente importantes para provedores de serviços de carteira eletrônica em países em desenvolvimento, pois eles podem usar esses resultados para planejar seus negócios e estratégias de mercado de acordo. O estudo também forneceu algumas recomendações que podem ser usadas como pontos-chave na promoção de serviços de carteira eletrônica.

Palavras-chave: Digitalização, *E-wallets,* Modelo DOI, Determinantes de *E-wallets*

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I would i also like to thanks my friends and collegues who were always there whenever i needed them for any kind of research assistance and help

Regards

Sameen Atiqa

Abbreviations and Acronyms

ADEW:	Adoption of digital wallet
DOI:	Diffusion Innovation Theory
TAM:	Technology Acceptance Model
CP:	Complexity
OB:	Observability
CB:	Compatibility
TB:	Trial Ability
PR:	Perceived Risk
f	Frequency
M	Mean
SD	Standard Deviation
df	Degree of Freedom
t	t- test
SE	Standard Error
B	Un-standardized Regression Coefficient
β	Standardized Regression Coefficients
p	Probability Value of Significance
r_s	Relationship
F	F-test (variation between sample means)

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Introduction

The increased digitalization of the processes and activities has converted the world into digital economy. The world is almost in the era of 5th industrial revolution after many nations adopts the third and 4rth industrial revolution of transforming into digital economies (Shahroom & Hussin, 2018). The readily available internet technology and gadgets that support this technology like computers, tablets, and smart phones are now readily available making this transition more convenient for the nations who are willing to adopt these changes. The increased online presence of majority of the businesses worldwide had also encouraged the people to use and adopt digital payment systems (Morrar, Arman, & Mousa, 2017). Digital payment agencies and payment processing companies are introducing innovative and convenient digital payment methods to their users that provide user experience far superior to the traditional transactions and exchange processes. This digital trading process is slowly and swiftly shifting the world economy to transform completely to digital systems. The rapidly increasing innovations and excellence in information technology is making this dream more achievable with every passing day (Turban, Leidner, McLean, Wetherbe, & Cheung, 2006).

The evolution of technology has opened up many doors to the world. It has made the world much more smart and efficient The digital forums and platforms are replacing the traditional physical means of business and financial activities (Pyka, 2017). One of the major technological advancement that has penetrated every home in the world is the smart phone. The number of people using smart phones has increased drastically in last decade. In 2020, the number of people using smart phone is currently 3.7 billion people, which is 9% more than the last year statistics (Gindrat et al., 2015). The smartphone penetration in the world's population is almost 45% (Al-Ghaith, 2021).These statistics indicated that smartphones have become an integral part of the lives of the people. The affordability and convenience of smart phone is evident with its consumption. However, the use of smartphones is not only limited to browser surfing and utilization of social media platforms only. There are numerous applications and services developed that are supported by smartphones to make the life of people more easy. Other than communication, entertainment and socialization smart phones are now used for monetary transactions as well (Lai, Farnham, Ruktanonchai, & Tatem, 2019). These mobile innovations have freed people from the time and special constraints of conducting commercial activities. The demand of people to transfer and receive money digitally has increased significantly. Today, people can send and receive money through their smartphones using different applications (Sivathanu, 2019). The applications that are used as alternative of leather wallet is called "Mobile Wallet" or "Digital Wallet".

Despite of the fact that digital payment methods have become quite common in many countries (Gindrat et al., 2015), this concept is still ill-informed and less understood especially in developing countries. There are number of factors that can affect the user choice of using digital payment methods that can be related to their understanding about the enablers and barriers related to such transformation.

Secondly, user acceptance and behavior intention are the major determinants discussed by numerous researchers that can affect the acceptance and adoption of new technology (Sivathanu, 2019). Digital wallets demonstrated a great potential to transform the traditional payment methods into digital methods. However, to measure its success it is important to understand various factors and determinants that can possibly affect the decision of the user intended to use such applications. Pakistan being a developing nation is struggling to cope with the technological advancement. Although digital payments and truncation methods has been adopted by the country and mobile or e-wallets are gaining significant popularity but still factors like education, lack of understanding and experience, etc. that affects the adoption and usability of e-wallets (Y. Chen, Moinuddin, & Yacobi, 2011).

The current research is designed specifically to identify and determine the factors or determinants of e-wallet adoption in Pakistan and to investigate that what are the major barriers or enablers considered by Pakistani people in using e-wallets for their monetary transactions. As digital wallets are studied to have a strong potential in playing their part towards digital economies especially in small or micro economic systems so this information is crucial. Based on these arguments, the main objectives for the current study are as follows:

- To critically evaluate the penetration of Digital and e-wallets in economy and their role in the transformation towards digital economy;
- To analyze the factors that affect the user adoption and behavior intention for adopting e-wallets;
- To investigate how adoption behaviors can impact the sustainability of digital wallet provisions;
- To identify the determinants of e-wallet adopting in Pakistan economy.

To achieve the proposed objectives, it was adopted an exploratory and descriptive research design using primary and secondary data. The philosophical approach taken in this research is positivist. Since this research aims at uncovering knowledge related to the current conditions existing among Pakistan users regarding their intentions to use or deny digital wallets in Pakistan. Deductive approach is adopted as research intends to explore adoptability and user conditions concerning the use of digital wallets, in the light of DOI theory and user behavior-based models (Lai, 2017). This research is essentially testing existing models about their presence in the chosen industry sector. As this is one of the first studies addressing the research problem in the sector, and there is very limited data available on the subject, a descriptive and exploratory study is more appropriate in setting the foundation for the research (Pelling, O'Brien, & Matyas, 2014). To collect primary data a survey by questionnaire was applied as it is aimed to analyze a large number of respondents, as has been proposed by Rothacker and Hauer (2014). Practically, this research will be useful for the business stakeholders of mobile wallet who would like to expand the business to earn more market shares. It is also helpful for individuals such as students to improve the knowledge of mobile wallet, which can possible lead to further research.

1. Literature review

This chapter systematically review the theories, models and relevant studies associated with the topic under study. First an overview of the shift towards digitalization has been discussed by reviewing the fourth industrial revolution. Afterwards the potential of E-Wallets in cashless transactions and online banking is discussed. The literature then provides a description of Diffusion Innovation Model and put light on the factors that affect the user behavior and intention to use new technology. The literature also includes an analysis of the previous studies conducted in this regard.

1.1 Fourth industrial revolution (4.0 IR)

The global economic platforms announced that the world is entering into the fourth industrial revolution because of rapid advancement in the digital high-tech innovations for example internet, block chain and artificial intelligence. The fourth industrial revolution (4.0 IR) is changing the financial systems, monetary, production and international trade (Brass & Hornsby, 2019; O'Donnell & Eng, 2019).

The 21st century associates with the fast technological revolutions (the 4.0 IR) around the globe, things and dealings are switching rapidly from physical mediums to virtual ones. Among all technological revolutions, mobile phone and internet have been greatly transformed the living, working, business, economy dealings of individuals. This transformation also affected the payment methods in developing as well as developed countries. Consumers these days are giving preferences to online shopping modes by using digital media.

In line with the popularity of mobile phones, virtual forms of payment system and mobile banking have also been introduced and providing a new mode of transactions safe and secure, easy to carry as well. The financial data in the form of digital wallets is used to exchange the financial value by the acquisition of services and goods. The term mobile or digital wallet can be interpreted as a payment, which facilitates the individual to use it electronically with the help of mobile devices. The leading user of digital payments is "Starbucks". The cashless services of the digital payments provide advantages to both merchants and users and impacts on the behavioral intentions (N. Shaw, 2014). The enormous usage of mobile devices in the financial dealings give direction in the development of digital or mobile payment systems (Kaur, Dhir, Bodhi, Singh, & Almotairi, 2020).

1.2 Significance of the Mobile Wallets

Kaur et al., (2020) mentioned that the digital payment systems have the good number of benefits, for example, perceptible transactions, cashless, versatility, economical, transparent, effectiveness, accessibility, ease of use, customer swiftness and time-effective. Further, the acceptance of the digital wallets supports us to control the individual digital identity at both level personal and business (Pasa et

al., 2017). In this context, it has also been stated, by 2030, the digital identities (mobile wallets) will unlock the economic value equivalent to 3% to 13% of the gross domestic product (GDP) (O'Donnell & Eng, 2019).

The acceptance rate of the mobile wallets is increasing with time. The way a country offers the services of mobile wallets depends on their available resources, financial institutes and service providers in the relevant fields. Range of the mobile wallet service providers is Google wallet and Isis mobile wallet. The digital wallet service providers in Pakistan are various, some of the more prominent are the following (Ibtasam et al., 2017; Zahra, 2018): *JazzCash; EasyPaisa; Zong PayMax; uPaisa; UBL Omni; Keenu*.

The combination of the payment method with mobile phones (see Figure 1) sorted out the various encountered issues of different payment scenarios.

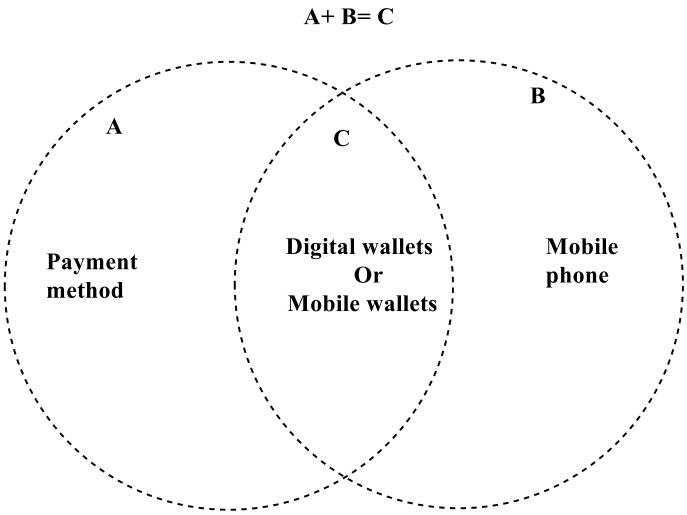

Figure 1: Development of Digital wallet

Source: Statistica (2018)

Literature summarized five types of scenarios that has been addressed by the introduction of E-Wallet. The payment scenarios were as follows (Singh & Sinha, 2020):

- Customer-to-customer payment;
- Mobile commerce payment;
- Electronic commerce payment;
- Stationary merchant person payment;
- Stationary merchant automat payment.

In different research studies (Chen et al., 2011), various range of terms and themes have been used to explain the notion of digital payment including, bitcoin electronic payment or cryptocurrency, mobile banking, online banking, mobile wallets (m-wallets), mobile payment systems (MPSs), electronic banking and internet banking. The instigators, as well as the inhibitors of digital wallet usage, can be helpful to highlight the key determinants of this new technological revolution (P. W. Chen, Jiang, & Wang, 2017).

1.3 Theoretical Implications of Digital Wallets

Literature is enriched with theoretical models (comparison is incorporated in Table 1) to observe and study the stimulus, drivers and instigators of the digital wallets' diffusion in the social circle. The authors of the recent study (Kaur et al., 2020) mentioned that intention to recommend (ITR) and intention to use (IU) are the main variables behind the adoption of digital wallets technology. Further range of models has also been discussed following the use of mobile wallets (Kaur et al., 2020). Some of the main was as these. These authors used diffusion of innovation (DOI) theory to explain the factors behind the IU and ITR behavioral determinants towards the adoption of digital wallet technology. DOI framework identified various components, which persuade in the IU and ITR behaviors of users. The components on which DOI based in this study were trialability, compatibility, observability, relative advantage and complexity (Figure 2).

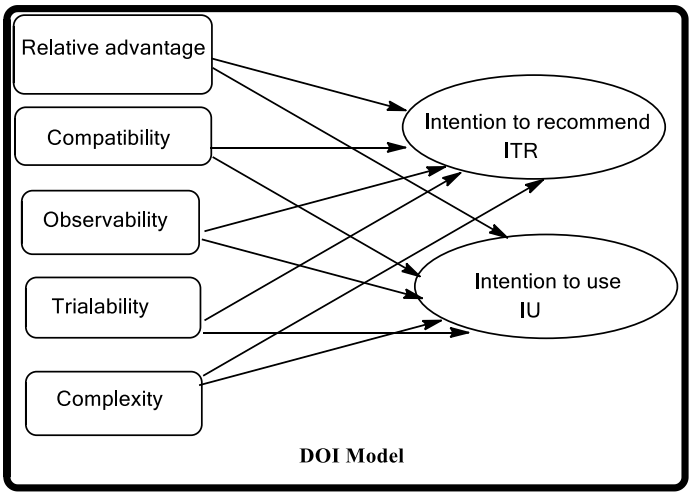

Figure 2: The Framework of DOI Model and Its Components

Source: Roger (1995, p.12)

While the results of this study reported that there is no significant relationship between the trial ability, IU and ITR whereas all the other components complexity, observability, compatibility and relative advantages found to be in positive relation with IU and ITR (Kaur et al., 2020).

Basically, this model gives direction about the overall procedure of development or the diffusion of any new product, service and technology within the society. Three stages of product adoption based on the DOI model are 1) Product commencing; 2) Gains momentum; and 3) Last diffusion into society.

In Table 1, it is presented the main theories used as framework analysis of the behavioral adoption of digital wallets. It compares the different available theoretical frameworks which different authors have been used in their researches to explain the main drivers behind the acceptance of mobile wallets.

Table 1: Main theoretical frameworks to understand the behavioral adoption of digital wallets

Model	Describes	References
Diffusion of innovation theory (DOI)	The innovation of diffusion within the social circle regardless of the user background	(Kaur et al., 2020)
Technology acceptance model (TAM)	Users' intention to use digital wallets	(Shaw, 2014)
Technology acceptance model 2 (TAM2)	Users' intentions based on perceived usefulness	(Shaw, 2014)
Unified theory of acceptance and use of technology (UTAUT)	Behavioral intents and satisfaction towards the acceptance of digital wallets	(Kaur et al., 2020; Shaw, 2014)
Integrated model on mobile payment acceptance (IMMPA)	Security factor	(Kaur et al., 2020)
Theory of planned behavior (TPB)	Human behaviors in the direction of adoption	(Alkhowaiter, 2020)
Theory of reasoned action (TRA)	As above	(Alkhowaiter, 2020)
Unified theory of acceptance and use of technology 2 (UTAUT2)	Habit, price and hedonic motivation as the key drivers of users' intentions	(Alkhowaiter, 2020)
Social cognitive theory (SCT)	Societal influences on the adoption of the technology	(Alkhowaiter, 2020; Kaur et al., 2020)

Source: Author's Own Elaboration

To gauge the acceptance of the digital wallets a model is developed in a recent research, which based on different determinants and hypothesis. This model was based on six (6) determinants and seven (7) hypotheses also associated to some extent with the technology acceptance model (TAM) while this acceptance model further consisted of perceived ease of use (PEOU) and perceived usefulness variables (PU) (Shaw, 2014).

This model highlights the influencers, which affect the acceptance of the user towards the adoption of mobile wallets. It mentioned that the main determinants of this acceptance framework are mobile wallet self-efficacy, intention to use, trust, informal learning and others as showed in Figure 3.

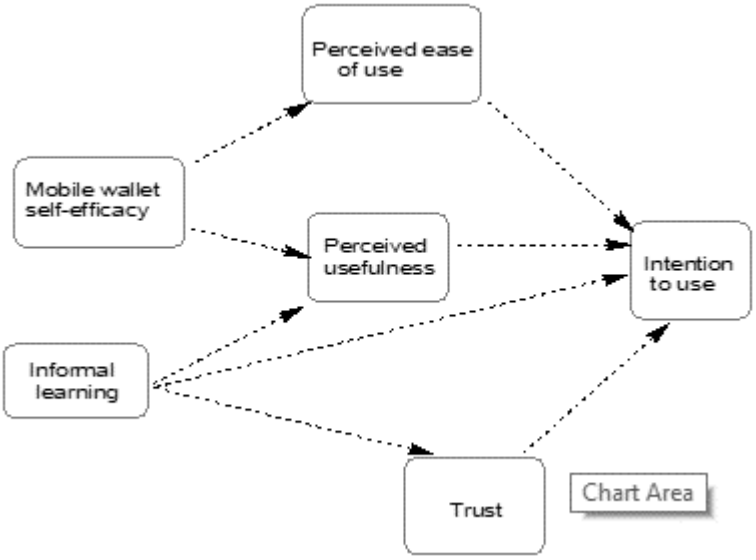

Figure 3*:* Acceptance model designed to predict the mobile wallet acceptance

Source: Shaw (2014, p.12)

The experience of the technological devices and the digital knowledge or literacy are greatly contributing in the acceptance (behavioral intentions) towards the use of the digital wallets (Jamila, Ratnawati, & Hussein, 2020).

The results of the study depicted that even though there is a range of advantages of digital wallets but still the users did not accept this technology on a wider scale. The challenges behind the restricted attitudes towards the adoption are reported as risks and insecurity associated with the mobile network nature. At present there are only less than 25% population (of India) who is using Paytm mobile wallet, still, 75% of the population did not use it. It is recommended that there is a strong prerequisite of the empirical research studies which can highlight the factors for the technologists that in which way they can speed up the diffusion of the digital wallet among the remaining population (Chavoshi & Hamidi, 2019; Kaur et al., 2020).

According to recent research (Singh & Sinha, 2020), it has been highlighted that the theoretical implications of the digital wallets can be described by using DOI model whereas the for the practical implications to enhance the number of users, the authors suggested some of measures such as (Singh & Sinha, 2020):

(a) Focus on increasing the “probability of the recommendation” to the adoption of the digital wallets, this can be done by giving importance to the services and the way companies do advertise and promote their services.

(b) It is noted from the survey, that the more benefits you provide the customers, the higher will be their recommendation formulation rate.
(c) Properly educate the customer about the any-where transaction facilities of mobile wallets, increase their trustworthiness and security of their transactional process.
(d) Focus on the young generation as they can play a constructive role in speeding up the process of mobile wallets diffusion into the social circle.

A recent study suggested four macro-factor to improve the acceptance rate of the digital wallets including pedagogical, individual, social and technological ones (Chavoshi & Hamidi, 2019). The compatibility of mobile wallet services with users can also play a significant role in speeding up the process (Chavoshi & Hamidi, 2019). Personal innovativeness, self-efficacy and trust determinants of each individual person are the key areas of observation in this regard (Chavoshi & Hamidi, 2019). Individual demographic factors, for example, age, gender and education level can also be an important predictor of acceptance of the mobile wallet (Chavoshi & Hamidi, 2019).

1.4 Behavioral intentions determinants and inhibiting forces of the adoption of Digital Wallets

Literature showed that the consumers do not accept the new technology easily, so, that is why they need proper learning or education about the existence of such innovative technologies after that trust on the service provider really matters. The trust that there will be no mishap during the customer's financial transactions and all the process will be accurately secure and smooth (Shaw, 2014; Singh & Sinha, 2020). Shaw (2014) described that among all three main factors, which persuade or can help to promote the innovative technologies are (i) technology acceptance; (ii) role of trust; and (iii) role of education or learning.

Informal learning variable is also very important along with the acceptance of technology determinant. Whenever a new mode of technology starts to provide services to general public, there is always a strong need for its awareness. It is reported that word of mouth (WOM) can play a constructive role in this regard. WOM is famous as a form of informal learning and comprised mainly on virtual, personal kinds of activities and interactions. The virtual means of WOM are magazines, newspapers, journal articles, website's posts. Whereas the personal means of WOM are the close relatives, family members, friends, colleagues and observing nature to their activities. The same research further explored that trust plays the role of the mediating variable in the adoption of digital wallets by the help of informal learning (Shaw, 2014; Singh & Sinha, 2020).

In accordance with the mentioned concerns, there is a range of independent variables of behavioral intentions, which influence the adoption, acceptance and espousal of digital wallets. It has been noted that some main factors are observability, trial ability, compatibility, complexity, relative advantages,

perceived risk, attitude, education, age, gender, perceived usefulness, perceived ease of use, social influence, effort expectancy, performance expectancy, hedonic motivation, perceived security, perceived privacy, trust (Singh & Sinha, 2020), intention to use, stress to use technology, recommendation to use, innovativeness, and perceived satisfaction with digital wallets (Singh et al., 2020; Sunny & George, 2018). The smartphone addiction is a positively associated with the acceptance of the mobile wallet technology while the research study also disclosed that the use of the suitable communication channel, right consumer and age group is very much important in this regard (B. Shaw & Kesharwani, 2019).

Likewise, it is reported that socialization or the social circle also drives the adoption of new technology. There is a significant relationship between the recommendation to use (social influence) and user-perceived satisfaction in the adoption of the technology (Singh & Sinha, 2020). In 2018, a study is conducted which used interpretive structural modelling method to analyze the inhibitors or the causes behind the unacceptance towards the digital wallet. The study suggested that the complexity of the new technology, lack of awareness of the associated benefits of the digital wallet, lack of skills in adoption to new technology and anxiety factor (Alkhowaiter, 2020).

1.5 Prior empirical research in the Pakistani market on e-wallet adoption

Not much empirical research has been conducted in Pakistan that analyzes the potential and influential actors on the adoption of E-Wallet in Pakistan. There are just few researchers that study the mobile money application in Pakistan. Among them, a study conducted by (Ibtasam et al., 2017) the evaluated three phases of learnability among Pakistani population about the use of mobile based mobile wallet applications. Their study found out that domain knowledge improves the learnability of people in using mobile wallets. Further, their study found out merits like effectiveness and sought out help affect the independent use of the applications. Factors like readiness and interface improvement were also identified in the study. However, the main conclusion of their study was that comprehension of relevance and awareness regarding mobile wallets affect its use and general acceptance. It was found out that there is not enough exposure of digital wallets in Pakistan. Similarly, Sidra and Butt (2017) in their article stated that there are number of factors that are basically in a way to realize the full potential of digital wallets in Pakistan. They identified number of factors like low penetration of the E-Wallets, lack of customer's understanding, insufficient promotions and trust issues that hinders the growth and development of e-wallets in Pakistan. Further, in a study conducted by Mehmood and Razzaq (2017), they evaluated step by step process of e-wallet application in mobile phones and analyzes how it works, what benefits it could offer. Their study revealed that the installation, registration and using the application is not that critical as it perceived as by general population. However, they discuss that people are not well aware of the applications and how they can actually bring their transactions cashless. Well, here we don't' find any research in Pakistan that has been focused on the behavioral and social factors that can be identified as determinants of e-wallet adoption in Pakistan. So, this research is a step to fill that gap. The literature covered the theoretical base for the social and behavioral factor the user adoption

and the current research collected empirical evidence to identify these factors in Pakistan. So this will a valuable contribution in this field of research.

2. Empirical Research Methodology

This chapter provides the description of the research methods, design, data collection method and an overview of data analysis. The chapter presents the research model as well presents the research hypothesis. An introduction to the data analysis techniques are also described.

2.1 Objectives and Research Questions

The current research intends to identify and determine the factors or determinants of e-wallet adoption in Pakistan and to investigate about what are the major barriers or enablers considered by Pakistani people in using e-wallets for their monetary transactions. Therefore, the main objectives for the current study are as follows:

a) To critically evaluate the penetration of Digital and e-wallets in economy and their role in the transformation towards digital economy
b) To determine the analyze the factors that affect the user adoption and behavior intention for adopting e-wallets
c) To investigate how adoption behaviors can impact the sustainability of digital wallet provisions
d) To identify the determinants of e-wallet adopting in Pakistan economy

Due to the above goals, the following research questions were considered:

1. What are e-wallets and how they play a role in the transformation of digital economy?
2. What are the factors that affect user adoption and behavior intention of people for adopting e-wallets?
3. How adoption behavior can affect the sustainability of digital wallet provisions?
4. What are the determinants of e-wallet in Pakistan?

2.2 Research participants and sample

The population of the study is the Pakistani individuals related to the different occupations that frequently use of mobile wallets. Therefore, the study participants are mainly local businessmen, vendors, government employees, private employees, farmers and teachers. The sample size of the research is consisted of N=300 participants' majority men, as because of the social culture of the country. The age of the participants of the study is between 25 to 40 years old.
The participants should be more than 25 years of age, familiar with the different mobile wallets survives available in Pakistan, for example, UBL omni, UPaisa, ZongpayMax, JazzCash and Easy-Paisa.

2.3 Research design and methods

The research design of the current empirical research study is exploratory and quantitative as the

literature about the determinants of mobile wallets is limited in the context of Pakistan and it is used a survey by questionnaire to collect quantitative data to analyze the general information distributed in the population. That is why more and more studies are carried out by using exploratory design research to get more in-depth knowledge regarding the raise issue, or it helps to contribute worthy facts to the existing literature (Huang, Lin, & Fan, 2015).

There is a strong need to analyze the role of diffusion of innovative theory (DOI) on the interpretation of the mobile wallet technology introduction, propagation and diffusion in Pakistan's domestic markets and localities.

The research approach used in the current research is deductive, as because of the presence of theoretical frameworks (DOI, TAM etc.) in the literature regarding the technology acceptance determinants. The mentioned models describe the main elements, which play a role in the diffusion and acceptance of the new technology in society.

The research model for the current study is shown below (see

Figure *4*):

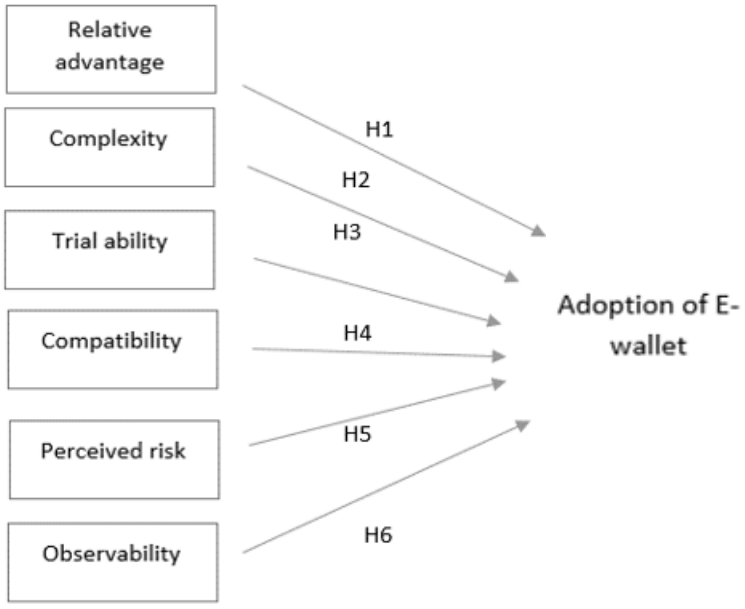

Figure 4*: Research Model*

Source: Author's own elaboration

Based on the research model the hypothesis of the current study are:

H1: Relative advantage is positively related with the adoption of e-wallet

H2: Complexity is negatively related to the adoption of e-wallet

H3: Trialability of e- wallet is positively related to the adoption of e-wallet

H4: Compatibility is positively related to the Adoption of e-wallet.

H5: Perceived risk is negatively related to the adoption of e-wallet

H6: Observability is positively related to adoption of e-wallet

2.4 Data collection tool, validity, process and data analysis methods

The data collection tool that has been applied in the research is the survey questionnaire. The tools are designed on the Google Forms app, usually uses for the survey questionnaire development and designing (Shaw, 2014). Some of the initial questions of the tool are about the demographic information of the participants for example gender, income and occupation, while the later questions are about the adoption, advantages, compatibility, trialability, complexity, perceived risk and observability determinants related to DOI model and mobile wallet acceptance. The questionnaire is designed to depict the association between the different mentioned research variables (Shaw, 2014).

The responses of the respondents are collected on a five point Likert scale as strongly disagree to strongly agree (1-5 rating between these responses) (Singh et al., 2020).

The survey questionnaire is distributed among the participants of the study within and soft and hard printable form depends on the available resources of the participants. The questionnaire did prepare in English initially and afterwards translated into Urdu (National language of Pakistan) for some of the participants for the sake of better understanding of the research (Kaur et al., 2020).

To ensure the validity, clarity and transparency of the responses and to gauge the participant nature of feedback ten participants were selected initially. The output of the participants gave an idea about the extent of data validation, following their responses on the initial stage, all the participant were guided in the later stage before the actual survey was conducted about the validity criteria of the responses (N. Shaw, 2014).

The process of data collection in the form of the survey questionnaire is a very laborious task especially in the case when the participants do not have any email account for virtual tracing, more physical work is required there. For the data collected from all the 300 participants, a time of almost two and, a half month is expended. Data assembly process is started in April 2020 and continued up to mid of June 2020.

Initially, some of the participants showed reluctant behavior and did not seem interested to take part in the underscore empirical research, due to data privacy and trust issues. Therefore, a great effort had been put on to convince the participants, to ensure the privacy of their personal information and for trust development. Different sitting was scheduled with different participants to educate them about the importance of the research. Therefore, the participants were agreed to fill the survey questionnaire. During the survey, the participants who were experienced any difficulty regarding the questionnaire understanding, scale interpretation and any other issue, they were properly supported to make it sure that the responses of the participants are in correct accordance with their behavior, learning and adoption of the contextual technology (Kaur et al., 2020).

Range of issues have been encountered during data collection including; questionnaires not filled properly (cutting and over attempted), some were unfilled and some were misplaced by the respondent. All these issues had been handled with a professional attitude and sorted it on an urgent basis to save time as maximum as possible. The data had been compiled finally from the participants after spending a good amount of time (2.5 months).

2.5 Data analysis

After, the completion of data collection the researcher applied statistical analysis. Frequency distribution tables were developed to indicate the response rate of participants towards each category of questions. In addition, spearman correlation was applied to test the relationship of variables with each other. Independent t-test was applied to check the mean difference between the two groups. Regression analysis was also applied to check the gender difference in adoption of E-Wallet.

3. Presentation of data and discussion of the results

This section analyzes the data collected in the survey and present them in the form of charts and figures. Interpretation is also provided along for better understanding of the findings.

3.1 Respondents profile

The response rate was 100% and all the questionnaires were returned completely filled. The figure 6 below shows the percentage of gender participation. Majority (78%) of the participants were male and 22% were female.

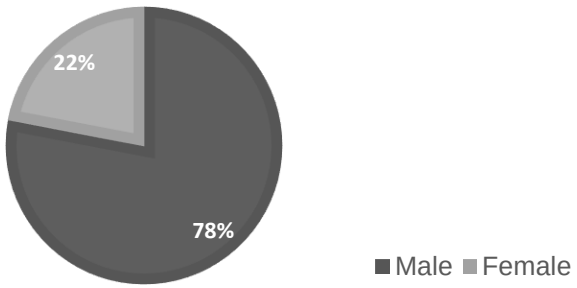

Figure 5: Gender percentage of participants

The figure 7 shows that the participants were distributed among all age groups. However, majority of the participants were between the age of 33 and 40 years.

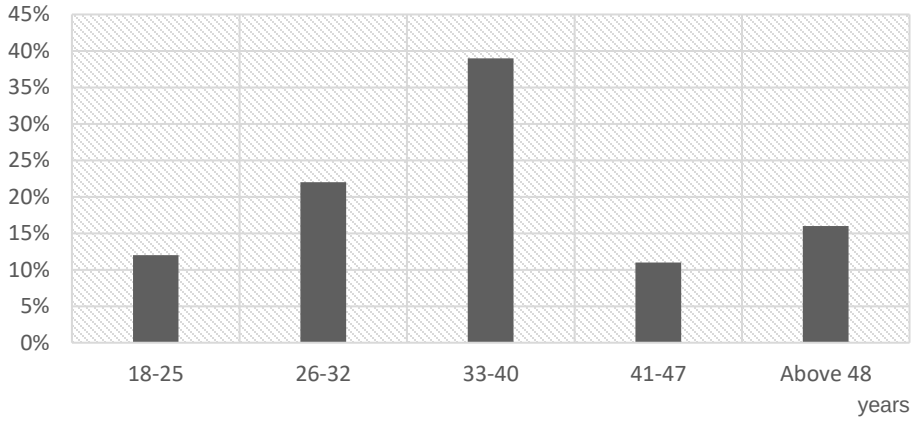

Figure 6: Age of the participants

The figure 8 shows that majority of the participants are private and government employees.

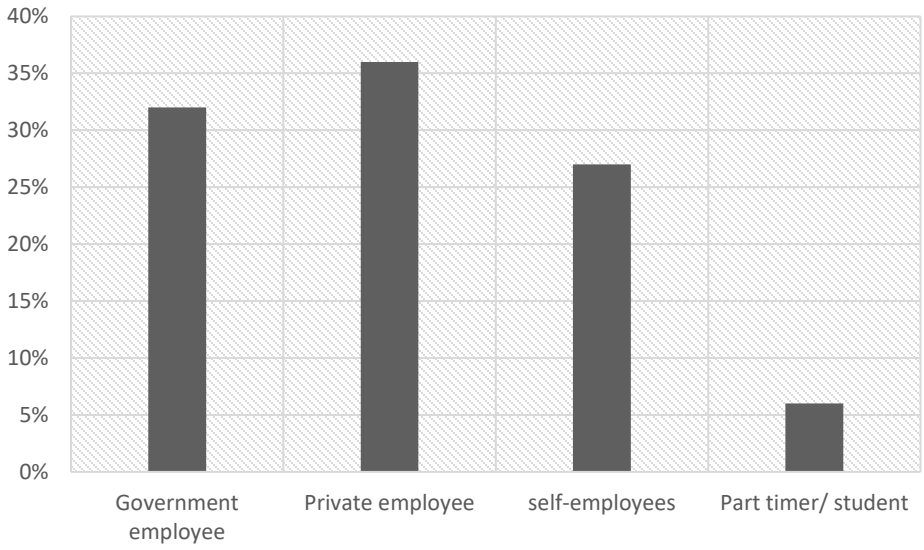

Figure 7: Occupation of the Participants

3.2 Descriptive analysis

This section presents the percentage analysis of the respondents to the questions in each category.

3.2.1. Adoption of digital E-Wallet

The response rate of the participants is shown in the Table 2. Majority of the participants indicated that they have used digital wallet as more than 50% of the respondents agree (65%) or strongly agree (21%) in question1. Majority of the participants (74%) do not prefer or are neutral about the use of digital wallet for banking, being 38% of respondents that gave neutral response that they are not sure whether they prefer digital wallet for banking and 34% disagree on preferring digital wallet for banking activities. Mixed responses were obtained whether the digital wallets are recognized in Pakistan or not. However, majority of the participants (55%) agree that digital wallets have potential to grow in near future. About the possibility of having web enable phone to increase the likelihood of using digital wallets, 43% of the participants gave a neutral response and 40% agree or strongly agree.

Table 2: Percentage analysis for Adoption of Digital Wallet

Questions	Strongly disagree 1		Disagree 2		Neutral 3		Agree 4		Strongly Agree 5		Average	St.dev.
	F	%	F	%	F	%	F	%	F	%	$\overline{X}$	σ
Q1	0	0	42	14	0	0	195	65	63	21	14	26.74
Q2	6	2	102	34	114	38	60	20	18	6	34	16.12
Q3	0	0	84	28	51	17	75	25	90	30	28	12.22
Q4	6	2	18	6	66	22	165	55	45	15	6	21.05
Q5	9	3	45	15	129	43	63	21	57	19	15	14.53

Notes: Q.1- Have you ever use any digital wallet in Pakistan such as Easy-Paisa, JazzCash, ZongPayMax, Upaisa, and UBL omni?; Q.2 - When you have banking to do is it likely that you would prefer digital wallet?; Q.3 - In Present, digital wallets is widely recognized and gain popularity in Pakistan?; Q.4 - Does digital wallet has more potential to grow in near future?; Q.5 - Since I have access to a web enabled mobile phone I would prefer to use digital wallet?; F- absolute frequency; % - relative frequency.

3.2.2. Relative Advantage

The table 3 shows majority of the participants agree (55%) that they prefer digital wallets for quick service. However, majority disagree (51%) that they don't find e- wallet services simpler. 30% of the participants does not believe that e-wallets improves efficiency while 28% indicated that it significantly increases efficiency. Majority of the participants (43%) gave neutral response on whether they find e-wallet convenient or not.

Table 3: Percentage Analysis of Participant's Relative advantage

Questions	Strongly disagree 1		Disagree 2		Neutral 3		Agree 4		Strongly Agree 5		Average	St.dev
	F	%	F	%	F	%	F	%	F	%	$\bar{X}$	σ
Q1	0	0	66	22	60	20	165	55	9	3	22	21.89
Q2	36	12	153	51	27	9	66	22	18	6	51	18.34
Q3	0	0	90	30	51	17	75	25	84	28	3	12.22
Q4	6	2	102	34	96	32	9	3	24	8	34	15.05
Q5	9	3	45	15	129	43	63	21	57	19	15	14.53

Note: q1. I prefer digital wallet to make quick services q2 I prefer digital wallet because the services are simpler q3I prefer digital wallet as it improves the service performance q4 I prefer digital wallet as it improves efficiency q5 I find it more convenient as it allows cashless payment

3. **Compatibility**

The table 4 shows that majority of the participants (51%) disagree that they are not able to keep systematic record of their financial transactions through digital wallets.33% agree that they prefer to use new technology and 11% strongly disagree that they prefer to use new technology. Majority disagree (30%) that digital wallet is compatible with their working style.

Table 4: Percentage Analysis of Participant's Compatibility

Questions	Strongly disagree 1		Disagree 2		Neutral 3		Agree 4		Strongly Agree 5		Average	St.d
	F	%	F	%	F	%	F	%	F	%	$\bar{X}$	σ
Q1		13		51		19		14		3	17	18.27
Q2		11		30		20		33		6	10	11.68
Q3		14		30		17		20		19	10	9.44

Note q1 Through digital wallet I am able to have a systematic track record of my financial statements q2I prefer to use new technology such as digital wallet Digital wallet is compatible with my working lifestyle q3

1. **Trialability**

Table 5: Percentage Analysis of Participant's Trialability

Questions	Strongly disagree 1		Disagree 2		Neutral 3		Agree 4		Strongly Agree 5		Average	St.d
	F	%	F	%	F	%	F	%	F	%	$\bar{X}$	σ
Q1	0	0	15	5	87	29	171	57	27	9	29	23.43
Q2	0	0	90	30	60	20	129	43	21	7	30	17.30
Q3	27	9	174	58	51	17	33	11	15	5	58	21.67

Note: q1 I want to try digital wallet for at least one month. Q2 I want to use digital wallet on a trial basis to see what it can do for me. Q3 In my opinion, digital wallet is easy to use

The table 5 shows that majority of the participants (57%) agree that they will try digital wallet for at least one month. Similarly, majority of the participants (43%) agree that they can use digital wallets on trial basis to check it. While majority (58%) disagree on the fact that digital wallets are easy to use.

1. **Complexity**

Table 6: Percentage Analysis of Participant's Complexity Measure of E-wallets

Questions	Strongly disagree 1		Disagree 2		Neutral 3		Agree 4		Strongly Agree 5		Average	St.d
	F	%	F	%	F	%	F	%	F	%	$\bar{X}$	σ
Q1	0	0	48	16	57	19	141	47	54	18	16	16.95
Q2	0	0	99	33	60	20	129	43	12	4	33	18.39
Q3	51	17	72	24	132	44	30	10	15	5	24	15.21
Q4	36	12	129	43	45	15	60	20	30	10	43	13.39

Note: q1 A lot of mental effort is required in digital wallet, q2 Technical skills are required for the usage of digital wallet q3.Sometimes digital wallet can be frustrating q4 I am aware about the functionality of digital wallets

The table 6 shows that majority of the participants (47%) agree that there is a lot of mental effort required to use digital wallet. Similarly, majority (43%) of the participants said that they think technical skills are required for using digital wallets. Mixed responses were obtained by whether participants find digital wallet frustrating or not. Majority disagree (43%) that they are fully aware of the functionality of digital wallet.

1. **Perceived risk**

Table 7: Percentage analysis of Participants Perceived Risk

Questions	**Strongly disagree 1**		**Disagree 2**		**Neutral 3**		**Agree 4**		**Strongly Agree 5**		**Average**	**St.d**
	F	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	$\bar{X}$	σ
Q1	0	0	60	20	30	10	195	65	15	5	20	7.90
Q2	24	8	57	19	33	11	168	56	18	6	19	20.72
Q3	0	0	36	12	27	9	204	68	33	11	12	26.15
Q4	30	10	81	27	45	15	105	35	36	12	27	11.74

Note: Q1 I fear that the information of my transactions may be tampered by others Q2Information about my transactions may be known to others Q3I fear that pin code might get lost and end up in wrong hands Q4Overall, matters of privacy have an influence on me using digital wallet

The table 7 above shows that majority of the participants agree that they have security concerns for e-wallet. For instance, 65% says that they fear that their transaction information can be tempered. 56% doubt that their transaction information can be used by others, 68% fear that they might lost or forgot the pin code and 35% says that overall privacy concerns can influence their use of digital wallets

1. Observability

Table 8: Percentage Analysis of Participants Observability of E-Wallets

Questions	Strongly disagree 1		Disagree 2		Neutral 3		Agree 4		Strongly Agree 5		Average	St.d
	F	%	F	%	F	%	F	%	F	%		σ
Q1	0	0	129	43	66	22	99	33	6	2		18.88
Q2	6	2	57	19	0	0	204	68	33	11		27.88
Q3	0	0	105	35	66	22	96	32	33	11		14.61

Note: Q1Friends around me discuss the use of digital wallet Q2I know someone who is using a digital wallet Q3Overall, digital wallet is useful for me

The table 8 shows that majority of the participants (43%) disagree that their friends talk about the use of digital wallet. While majority (68%) do agree that they know someone who use digital wallet. mixed response were received on asking the overall usefulness of digital wallets. 35% disagree on that and 32%agree that it is useful.

3.3 Correlational Analysis

The reliability of the data collection questionnaire was tested through Cronbach Alpha. The table 9 below shows that the value obtain was .812 which indicates that internal consistency of the questionnaire is good.

Table 9: Reliability statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized items	No.of items
.812	.878	27

The study objectives were to find out that how different factors affect the E-Wallet adoption. Therefore, correlation analysis was applied to determine that whether the variables have positive or negative correlation with each other.

Table 10: Relationship between dependent and independent variables

Variables	1	2	3	4	5	6	7
1. Adoption of Digital Wallet	1.000	-.097	.282**	-.201**	.104	.393**	.619**
2. Relative Advantage		1.000	.304**	-.384**	-.506**	.481**	-.195**
3. Complexity			1.000	-.067	-.228**	.225**	.179*
4. Trialability				1.000	.611**	-.553**	-.135
5. Compatibility					1.000	-.379**	.202**
6. Perceived Risk						1.000	.385**
7. Observability							1.000

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Spearman rank order correlation is a nonparametric measure of the strength and direction of association that exists between two variables. According to Table 10, dependent variable Adoption of Digital Wallet have significant negative correlation with Independent variable Relative advantage (-.097), and also Dependent variable have weak correlation with independent variable Trialability (-.201), dependent Variable also have significant weak positive correlation with Independent variable Complexity (0.282). Whereas Perceived Risk has a weak positive correlation (.0393). Observability have Strong correlation (0.619) with Dependent variable Adoption of Digital wallet. While independent variable Compatibility (0.104) Weak positive correlation with Dependent variable Adoption of Digital Wallet

3.4 Independent t-test

Independent T-test was applied to check the mean difference between two groups. The provided age group was selected for applying T-test because majority of the participants belonged to this age group. T-test was applied for additional analysis that whether age has an effect on adoption of Digital wallet or not.

Table 11: T-test of independent and dependent variables and Mean and standard deviation calculation

Variables	Age (n=24) 18-25	Age (n=42) 26-32	T- test		
	M (SD)	M(SD)	t	*df*	*p-value*
Adoption of Digital wallet	2.2000 (.16681)	3.1190 (.27251)	-14.969	64	<0.001
Relative Advantage	2.8000 (.00000)	3.2476 (.19660)	-11.117	64	<0.001
Complexity	2.6667 (.00000)	2.5873 (.29273)	1.324	64	.190
Trialability	3.3333 (.00000)	3.3333 (.00000)	4.681	64	<0.001
Compatibility	3.2500 (.00000)	3.0952 (.1228)	6.150	64	<0.001
Perceived Risk	2.7917 (.09517)	3.2262 (.24575)	-8.291	64	<0.001
Observability	2.6667 (.00000)	2.6667 (.00000)	-14.734	64	<0.001

An independent-samples t-test was conducted to compare independent variable and dependent variable. There was a significant difference in the scores ADEW (M=2.2000, Std. D= 0.16681, t(64)= -14.969) RA (M=2.8000, Std. D= 0.00, t(64)= -11.117), CP (M=2.6667, Std. D= 0.00, t(64)= 1.324), TB (M=3.3333, Std. D= 0.00, t(64)= 4.681), CB (M=3.2500, Std. D= 0.00, t(64)= 6.150, p= 0.000), PR (M=2.7917, Std. D= 0.9517, t(64)= -8.291, p= 0.000), OB (M=2.6667, Std. D= 0.000, t(64)= -14.734, p= 0.000). These results suggest that CP, TB, CB moderate positively affect ADEW even they not much deviate with ADEW. While RA, PR and OB have Stronger Negative affect on the ADEW. T sample Test use to compare dependent and independent variable with two age groups. Group statistics represents the Mean and Standard Deviation of the age group 18-25, ADEW (M=2.2000, Std. D= 0.16681) RA (M=2.8000, Std. D= 0.00), CP (M=2.6667, Std. D= 0.00), TB (M=3.3333, Std. D= 0.00), CB (M=3.2500, Std. D= 0.00), PR (M=2.7917, Std. D= 0.9517), OB (M=2.6667, Std. D= 0.000).

3.5 Regression Analysis

Regression analysis was applied to test the strength of relationship between independent and dependent variables. This help in understanding that how strongly or weakly a variable can affect other in future.

Table 12: Regression Analysis of dependent and independent variables (N=200)

ANOVA[a]					
Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	43.608	6	7.268	37.032	<0.001[b]
Residual	37.879	193	.196		
Total	81.488	199			

a. Dependent Variable: ADEW_Total

b. Predictors: (Constant), OB_Mean, TB_Mean, CP_Mean, PR_Mean, RA_Mean, CB_Mean

The table 12 above indicates that the regression model predicts the dependent variable significantly well. In the row of Regression, the significance value (<0.001) is less than 0.05 and indicates that, overall, the regression model statistically significantly predicts the outcome variable.

The table 13 demonstrates the coefficients that provide information that is predicted by the independent variable to dependent variable about relationship. Perceived risk and observability impacts positively and statically with significance on the adoption of digital wallets. The other variables are not statistically significant. Relative advantage and trialability have a negative sign but accounts less than 10% and are not statistically significant.

Table 13: Regression coefficient of the independent variables

	B	**Std. Error**	***β***	**t**	***p-value***
(Constant)	-.056	.663		-.084	.933
Relative advantage	-.011	.110	-.007	-.103	.918
Complexity	.027	.069	.023	.391	.696
Trialability	-.129	.149	-.065	-.866	.388
Compatibility	.074	.086	.066	.866	.387
Perceived Risk	.665	.102	.453	6.532	<0.001
Observability	.462	.069	.472	6.691	<0.001

a. Dependent Variable: ADEW_Total

3.6. Discussion of the Results

The results derived from the analysis are presented and relevant discussion is provided in which the study results are compared with the results of other studies

H1: Relative advantage is positively related with the adoption of e-wallet

Relative advantage was found to have negative correlation (rs=-.97) with adoption of E-Wallet. Further, the study revealed that majority of the participants demonstrated a lack of understanding related to the advantages of e- wallets. Majority of the participants said that they do not prefer e-wallets, as they do not believe that e-wallet is an efficient way for their financial transactions. Further, they also reported to believe that e-wallet services are complicated and they do not find them easy to use. Most of the participants were neutral as they were not sure that whether e-wallet will be effective for them or not. So, this result rejected our first hypothesis. Similar results were presented by researchers like Obidat et al., (2022). Their study involved analyzing the post adoption behavior of Mobile Wallets. The study results indicated that majority of the participants were not fully convinced that they actually be having a relative advantage for adopting E-wallets Understanding relative advantage of a technology depends on various factors. Researches argued that innovations that are new and are not advertised properly can lack to reach maximum users (Aksoy, 2017). The reason behind people inability to understand is that there is not much advertisement related to the benefits associated with e- wallets in Pakistan. Most of the advertisement is focused on the services but less has been addressed that how it can make life easy. However, the neutral percentage of participants indicated that people start to understand and believe the advantages of e- wallets and willing to use it in future (Afshan, Sharif, Waseem, & Frooghi, 2018).

H2: Complexity is negatively related to the adoption of e-wallet

The relationship of complexity with e-wallet adoption was found to be weak positive Complexity (rs=0.282). It was also found to be a weak negative indicator (table 12). The frequency distribution of the variable complexity (Table 7) indicated that people find using E-Wallet difficult and agree that using E-Wallets can be frustrating and disagree that they are fully aware of the functionality of the e-wallets. However, the results were not statistically significant so this hypothesis was rejected. Studies conducted in Pakistan like the one conducted by Ibtesiam et al (2018) revealed that lack of exposure and domain knowledge about the e-wallet make it difficult for the people to understand the functionality and potential of e-wallets. Further, lack of necessary information and literacy rate also affects the adoption, as people are unable to understand the mechanism of mobile payments.

H3: Trialability of E-Wallet is positively related to the adoption of e-wallet

Well, despite the fact that trail ability was found to have a weak negative correlation and found to be weak negative predictor of e- wallet adoption, the percentage analysis in frequency distribution (Table

5) shows that majority of the participant show positive response to give e-wallet a try even for once. So this hypothesis was moderately accepted. They show tendency to explore that whether e-wallets are convenient option for financial transactions or not. However, majority still believed that e-wallet is not easy to use. The tendency towards giving E-Wallet is influenced by several factors. Online banking has been introduced in Pakistan more than a decade now and people are slowly getting awareness regarding digital and online payment methods (Chohan, Hu, Si, & Pasha, 2020; Shaikh, Glavee-Geo, & Karjaluoto, 2017). Secondly, in Pakistan the main leading e- wallet service providers are the top cellular networks in Pakistan like Jazz and Tlnor that are offering apps like Jazz cash, Easy Paisa etc. not only they are using strong promotions but are also offering several discounts like cash backs, shopping voucher etc. to attract people. People are slowly yet gradually shifting towards this transactional option but it will take time unless these apps are also launched in local languages (Mustafa et al., 2019)

H4: Compatibility is positively related to the Adoption of e-wallet.

The correlation analysis suggested that compatibility has a weak positive relationship (rs=0.104). Similarly, the t-test indicated that compatibility has a weak positive affect on e-wallet adoption. However, if we look at the frequency distribution table (Table 2) many participants disagree that e-wallets are compatible to their life style. They are more comfortable with traditional methods of transactions. They are reluctant to adopt a new technology especially for their financial. Reluctant to adopt a new technology has been discussed by many researchers (Kumar & Gupta, 2021; Mombeuil, 2020), especially in their studies of developing countries. These researches suggest that in under develop and developing countries like Pakistan, India, Srilanka, Malaysia etc. people are stick to their roots and are not willing to change their norms and behavior (Vululleh, 2018). The new generation however, usually get excited with new innovation but most of the middle age and old people feel more comfortable and compatible with their traditional methods for managing and conducting their financial activities (Kamal, Shafiq, & Kakria, 2020)

H5: Perceived risk is negatively related to the adoption of e-wallet

Another important determinant identified that influence the adoption of E-Wallet in Pakistan is the perceived risk associated with the use of this applications. The correlation analysis shows that perceived risk has a weak positive correlation (rs=.0393) with e-wallet adoption. However, the regression co efficient values suggest that Perceived risk is a strong predictor of e-wallet adoption. The frequency distribution of respondents (Table 7) shows a great tendency towards people believing that their information can be misused and tempered by agencies for their own benefit. Secondly, people reported the fear to lose or forget the pin code or password and consider the process of resetting confusing. So this hypothesis was accepted. The privacy concern is also reported as majority of the people rely on local vendors for their transaction because they don't understand the language (Rizvi, Naqvi, & Tanveer, 2018). So they are reluctant to use these apps. Risks associated with online banking and using digital payment methods are very common in developing and under developing countries. The corruption rate

is also very high. There are thousands of fraud cases reported on daily base. Therefore, as the app are not in local language and most of the people have to rely on other people for these services so the risk associated is a major factor affecting the people's behavior and intention to use new innovation. However, modern studies indicated a high rate of user adoption of e-wallets in developing countries indicated that there is an increased awareness and people now begin to trust these digital payment mediums for their financial transactions (Rahman, Shafique, Khurshid, Asghar, & Ghafoor, 2020).

H6: Observability is positively related to adoption of E-wallet

The correlation analysis indicated a strong relationship of observability with adoption of E-wallet (rs=0.619). It was also found to be positive predictor of e-wallet adoption. The frequency distribution table (Table 8) also indicated that participants observe people that use E-wallets around them. So this hypothesis is accepted. A lot of studies like the one conducted (Jain & Singhal, 2019; Ramli & Hamzah, 2021) indicated that the social influence and peer pressure impacted the behavior to adopt an innovation. Pressure of society, friends and family have varying degree of influence on individuals who believe them to be important. So usually, people adopt technology not because it is useful but because everyone else is using it. This confirms that it is a positive indicator for the adoption of e-wallet.

Conclusions, recommendations, limitations and suggestions for further research

The study was designed to identify the determinants of E-Wallets in Pakistan. The current study progressively concluded that shifting towards a digital economy is fundamental. Economies around the globe are making efforts to become digital economies through the digitalization of their departments. The business has been dramatically affected by how financial transactions have been conducted ad carried out today. Online and digital banking is no longer a new term. The advent of the 4.0 industrial revolution indicated that it is not long before the world economy will be completely digitalized. However, factors affecting people's behavior, intention and decision to adopt and utilize a technology depend on several factors. The study discussed various models like the technology acceptance model (TAM) and diffusion of innovation model (DOI). Researchers have gathered the most commonly observed and determining factors that affect the person's behavior, intention and intention to use technology.

The study provides theoretical evidence that the E-Wallet is a new and effective tool that can significantly transform an economy towards digitalization. The utilization and development of e-wallets provide opportunities for digital payments and a much safer, more efficient and cashless transaction option. Similar results were presented by different researchers who considered e-wallets more efficient than online banking as they are easy to use and comprehend by the general public (Kazan & Damsgaard, 2013). They are advocating for bringing digitalization to every doorstep and in every person's hands that, collectively, become a digital society and heading towards becoming a digital economy (Sanatani, 2017).

The study also provides theoretical evidence of various factors that can affect the user adoption and behavioural intention of people to adopt and use – wallets. It was found that behavioral factors like willingness to use, acceptability, and trialability of new inventions affect whether the person accepts a new technology or not. Similarly, technological factors like ease to use and cultural factors like peer pressure, availability and acceptance in society also affect user behavior and intention. Numerous researchers and scholars have discussed these behavioural, technological and cultural factors. Various models like the technology acceptance model (TAM), task technology fit models (TTF), the theory of reasonable action (Al-Emran, Mezhuyev, & Kamaludin, 2018), the theory of planned behavior, TAM2, the unified theory of acceptance and use of technology, among others, all are different models and theories that determine various factors that can affect the use, adoption, intention to adopt and behavior intention of the user towards technology and innovation. So it is essential to consider these factors before launching a new technology or innovation in society (Joo, Park, & Lim, 2018).

The most prominent factors discussed in the study were the relative advantage, compatibility of the innovation, observability, trialability of whether the person is willing to try innovation and not and perceived risk of losing personal or financial information. When these factors were analyzed in the

Pakistani population, the most prominent factors affecting the use of digital wallets were compatibility, trialability and perceived risk. People do not necessarily consider E-Wallets compatible with their lifestyle as they are more convenient with traditional transaction systems and practices. In addition, security concerns are profound, and people do not believe that their money and financial information are safe with such innovations.

Considering the benefits of e-wallets, it is essential that people understand the potential of e-wallets and how they can save time and effort. For that, some recommendations are made, which are given below:

Insert within brackets some examples of authors

1) Creating awareness

The overall literacy rate in Pakistan is not much high. Also, people are bound by their traditional ways of doing things. There is always reluctance regarding new things, especially new technology. People always consider going out of their comfort zone or adopting new ways. Therefore, it is essential to create awareness among the general public regarding the benefits and potential of e- wallets. This awareness can be created at both the government and business levels to shift the economy towards digitalization swiftly.

2) Developing applications in the local language

One of the main barriers to adopting e-wallets is the technology and language barrier. English is not the local language, and most people cannot read and write in English. Almost all e-wallet apps are in English, so people are reluctant to use this technology, as they must depend on others for their monetary transactions. Therefore, financial service-providing companies should develop such websites and applications in the local language so that it will be easy for people to use them without relying on other people.

3) Effective customer support

To promote e-wallet services and to create awareness, customer support and care departments can play a crucial role. Adequate customer support can not only clear people's doubts regarding their risk concerns but can also play a part in developing people's trust in such applications. Therefore, financial service-providing companies should carefully establish and maintain their customer support services and departments to gain trust and convince more people to use such services.

4) Ensuring the safety and security of information

As corruption is one of the significant issues in the Pakistani government, e-wallet service providers must make sure that they ensure their user's and potential customers' safety of their personal and financial information. Make their procedures secure and encrypt any conversation include. Once people gain trust

and their concerns regarding risks are addressed, they will automatically drive towards adopting e--wallets and similar applications for their financial transactions.

There were also some limitations to the study. The sample population was only from Islamabad, as the researcher did not have the time and resources to reach people in different areas. Additionally, Islamabad is a well-developed city, and the exposure of the people here may be more than that of other cities of Pakistan, mainly rural areas. Therefore, the results cannot be generalized for the whole Pakistani population. For future research, it is suggested that a comparison could be made between people from cities and people from rural areas to compare whether adoption factors are the same or different for these two groups of people.

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Appendix 1

The survey form for the current study can be found on this link

https://docs.google.com/forms/d/e/1FAIpQLSccDDDvkQId9FuzKohWmeW8nxM6iyuWbd16UQ9HU5HkOob6zQ/viewform

4. Appendix: Questionnaire

Adoption of Digital Wallet

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1. Have you ever use any digital wallet in Pakistan such as Jazz Cash, UPaisa, Easy-Paisa, , ZongPayMax,, and UBL omni *	1	2	3	4	5
2. Would you like to use digital wallet when you already have banking options?	1	2	3	4	5
3.To what extent do you believe digital wallets are recognized or popular in Pakistan?	1	2	3	4	5
4. Do you think industry of digital wallets have potential to grow in Pakistan	1	2	3	4	5
5. Will you use digital wallet if you have access to web enable mobile phone?	1	2	3	4	5

Relative advantage

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1. Prefer Digital wallets as it can make quick services	1	2	3	4	5
2. Prefer digital wallet as the services offered are simple	1	2	3	4	5
3. Prefer Digital wallet as improves the performance of the service	1	2	3	4	5
4. Prefer digital wallet as it improves efficiency	1	2	3	4	5
5. Prefer digital wallet as it allows cashless transactions	1	2	3	4	5

Compatibility

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1. Digital wallets allow you to keep systematic track record of your financial activities and statements	1	2	3	4	5
2. I prefer digital wallet as it is a new technology	1	2	3	4	5
3. I find digital wallet compatible with my life style	1	2	3	4	5

Trial ability

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1.I want to try digital wallet for at least one month.	1	2	3	4	5
2. I want to use digital wallet on a trial basis to see what it can do for me.	1	2	3	4	5
3. In my opinion, digital wallet is easy to use	1	2	3	4	5

Complexity

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
2. I want to try digital wallet for at least one month.	1	2	3	4	5
3. I want to use digital wallet on a trial basis to see what it can do for me.	1	2	3	4	5
4. In my opinion, digital wallet is easy to use	1	2	3	4	5
5. I want to try digital wallet for at least one month.	1	2	3	4	5

Perceived Risk

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
2. I fear that the information of my transactions may be tampered by others	1	2	3	4	5
3. Information about my transactions may be known to others	1	2	3	4	5
4. I fear that pin code might get lost and end up in wrong hands	1	2	3	4	5
5. Overall, matters of privacy have an influence on me using digital wallet	1	2	3	4	5

Observability

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1. Friends around me discuss the use of digital wallet	1	2	3	4	5
2. I know someone who is using a digital wallet	1	2	3	4	5
3. Overall, digital wallet is useful for me	1	2	3	4	5