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Factors influencing customers' attitude for using M-Birr adoption in Ethiopia

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ABSTRACT

Diffusion of Innovations (DOI) is a theory to explain how and over time new philosophies and then technology diffuses into different contexts. This research tested the attributes of DOI and other variables empirically, using M-Birr system as the goal of the innovation. The research was conducted among customers of M-Birr service in Addis Ababa, Ethiopia. Data collection instrument was a closed-ended questionnaire administered to 360 respondents of which 211 were returned giving 58.6% return rate. The demographic make-up of the respondents showed that most of them were between the age of 30 to 50 and degree holders. From the factor analysis aspect, it showed that confidence, service quality, and trialability constructs positively affected the attitude towards using the technology while the compatibility, relative advantage, and complexity were negatively affecting the attitude towards using the technology. The study concluded that the customers' attitude positively affects the use of technology adoption.

Keywords: Diffusion of Innovation, M-Birr, Adoption, DOI.

1. INTRODUCTION

Now a day, Information technology is playing a great role in the different working environment of the industry especially the banking industry with the help of modern information communication infrastructures (Worku 2010). Since the introduction of the Internet in 1969, it has been growing rapidly with different opportunities for the business. Of this evolution are, banks provide electronic financial products and services to their customers(Lemma, 2018).

It is true that the internet is the driving force of banking transactions for using Information technology in their day to day activities. For this, one of the helpful In daily transaction is mobile Banking which is easy to acquire, process, and deliver the information to all relevant customers (Tan et al. 2000).

According to Ethiopian Microfinance Institution, a number of banks are providing different mobile banking services. Such as commercial banks of Ethiopia, are beginning to appear with CBE Cash, Ambesa Bank with Hello cash. This is because; Mobile banking revolutionizes the way banks

operate, deliver, and the means to be competitive against one another in the banking industry(Shaikh, 2014).

1.1. The Motivation of the Study

Different authors have defined the term mobile money. To mention some, mobile money is the banking and financial transactions services provide by the bank via smartphone devices. (Lemma, 2018). According to Ardic, et al, (2011) cited in (Lemma, 2018) the first mobile money service was launched in Kenya in the year of 2007 which has around 15million mobile service customers and this is the largest number in terms of mobile service users in the world. Considering the Ethiopian banking service, the country has very low banking service in comparison to the sab-Saharan countries and Ethiopian population which is the second populated country in the continent(Bultum, 2014; Demeke, 2013; Lemma, 2018). Now a day, there are a number of alternatives to use banking service like Bank branches, ATM machine, mobile banking services. However, these Chanelle's are not cost effective especially for developing country due to high initial investments. today, around 67% of the world population is mobile users which makes mobile is the largest electronic device for banking transactions(Lemma, 2018). Therefore, this study is motivated by the following three points,

First, mobile banking service helps for the financial services to increase their sales and increase profits but this needs to understand how much the mobile banking services are adopted by the customers like how easy is the mobile banking services for the customer, what are the benefits the customers can get for using this service(Lemma, 2018). However, As we can understand from the below table 2 there is no agreement on the prediction of factors to adopting mobile banking services users. For example, a study conducted by (Zhou, 2012)found a positive relationship between service quality and trust in adopting M-banking service. However, a study by (Laekemariam Haile, 2015)reported a negative relationship between service quality and M-banking services.

Second, the Mobile birr(M-Birr) service which is the locally contextualized name of Mobile service in Ethiopia was launched by a Dutch company called BelCash which working in partnership with Ethiopian banks to provide banking services through bank accounts of their customers is young in Ethiopia and according to Lemma (2018) now a day there are around seven million mobile users in Ethiopia but level of the registered customers is seems as low compared to

the total number of customers. Therefore, the researchers believe that identifying the factors that hinder for adopting the M-birr users is open for research since there are no adequate studies that have been done to find out the factors that influence the adoption of M-Birr which creates a research gap that this study seeks to fill by investigating the factors influencing the adoption of M-Birr service by considering the DOI theory variables.

Finally, As shown below in table 2 researches have been done concerning factor affecting the adoption of mobile banking overseas using different earlier models, TAM(Dineshwar & Steven, 2016), UTAUT and TRA models. however, as per the researcher's investigation across different kinds of literature few pieces of research conducted across the globe but still, there are no researches done and published using DOI in the Ethiopian context, the modified model, concerning the adoption of mobile banking in Ethiopia. Besides in Ethiopia, since mobile banking is a new phenomenon, studies in this sector still remain untouched. The first bank to deploy mobile banking service in Ethiopia is Commercial Bank of Ethiopia (CBE) one of the biggest governmental banks in Ethiopia. Therefore, conducting such research may help financial institutions to understand the factors affecting the adoption of Mobile Banking service than after it will make Mobile Banking service into a form acceptable to customers. This study follows the DOI defined by Rogers (1995) which includes five factors that impact innovation adoption. These factors include relative advantage, compatibility, trialability, and complexity. Therefore, the objective of this study is to identify the factors affecting the adoption of Mobile Banking services in Ethiopia. Having this objective this study is expected to answer the following research questions:

RQ1: what are the factors that hinder for adopting mobile birr services in Ethiopia?

1.2. Banks and Mobile Banking Services in Ethiopia

According to the National Bank, mobile banking is determined as the procedure of performing banking activities which mainly consist of spreading and maintaining mobile/regular reports and accepting deposits using mobile devices. In addition to this, it can also define that, The Mobile banking services allow customers to make different transactions using their mobile phones such as, making payments as well as receive money from the linked bank account of each customer (Lin 2011).

According to (Lemma, 2018), Mobile banking technology is copied from different countries. Such as, Hello cash from BelCash firm of Netherlands-based and M-Birr from Mini one-stop shop (MOSS) firm of Ireland-based adopted their technological solutions to the Ethiopian Banking industries.

Mobile banking services (money transfer) in Africa is known by a different name and by the bank's choices. Such as M-PESSA in Kenya (Gikunda, Abura, & Njeru, 2014; Van Hove & Dubus, 2019) M-Birr and HelloCash in Ethiopia(Bultum, 2014; Lemma, 2018). As in Kenya M-PESA has grown rapidly, which covers more than seven million users, this is around 38 percent of Kenya's adult population, and this is the most widely or is a success story across the developing world(Van Hove & Dubus, 2019). As already indicated that HelloCash, CBE-Birr and M-Birr money transfer systems exist in Ethiopia(Demeke, 2013; Lemma, 2018) but this study focused on M-Birr service because it had large users, started earlier than the others and have many agents in the country.

In Ethiopian Case, most of the banking industry service taking M-PESSA, a more successful mobile banking system of Kenya, as a benchmark to reach in its level which enables users not only to deposit but also withdraw, borrow and return. Also to save, to purchase pre-paid phone credit, other goods (services), to pay bills, and to execute bank account transactions. Nevertheless, consumers do not need bank accounts in order to use M-PESSA (Jack et al. 2010).

According to (Bultum, 2014; Lemma, 2018), giving mobile banking licenses for banks is the responsibility of National Bank of Ethiopia that each bank who wish to provide Mobile banking services to his customer are expected to submit first its detailed business plan, policies, and procedures of operation and risk management of the bank. And, M-Birr targets rural residents. For this reason, it is effective by microfinance institutions (MFIs), namely Addis Credit, Dedebit Credit, Amhara Credit, Oromia Credit and Omo Credit in 2013 based on the directive of the National Bank, Regulation of Mobile & Agent Banking Services Directives No. FIS/01/2012.

According to a study by(Demeke, 2013)stated that to have M-Birr users are required to deposit 40 Birr for the first time and they will contract services such as deposit their money, with no interest offered, and they can take away. They can also transfer money to others, whether they are the account holder or not. That they are charged for so for this, the smallest rate is 4.60 Birr for

amounts less than 6,000, and the rate increases at intervals until it makes a maximum of 23.58 Birr for amounts between 20,000 and 25,000 Birr. The service is accessed by dialing *818# on their mobile phones and follow recorded instructions.

Agents of this microfinance are typically local shops, grocers, kiosks, supermarkets, and petrol stations that have been trained in how to use the technology and have contracts with the microfinance institutions to provide cash-in and cash-out services. Their benefit comes in the form of commissions; each transaction increases their gain.

Many of the financial institutions in Ethiopia have their own brands, and source from different suppliers like that of Bell Cash. Some of the microfinance providers in Ethiopia are listed in table 1 below.

Table1. The main micro-finance enterprises in Ethiopia

Microfinance Name	Primary Operating Region	Symbol	Story Of the Microfinance
Amhara Credit and Savings Institution S.C (ACSI)	Amhara		ACSI was licensed as a Microfinance Institution in April 1997. Its operation will remain in the Amhara region, but increasing outreach by 50% by expanding to more villages/Peasant Associations.
Addis Credit and Savings Institution S.C (ADC)	Addis Ababa		Addis Credit and saving institution were established to give full support to micro and small-scale business operators in Addis Ababa & Oromia region surrounding Addis Ababa, Burayu & Sululta.
Dedebit Credit and Savings Institution S.C (DECSI)	Tigray.		The first operations began in 1994 and the organization was legally recognized in 1997 as part of the first law on microfinance in Ethiopia enacted that year.

Oromia Credit and Savings S.C (or OCSSCO)	Oromia		OCSSCO has a mission of poverty alleviation in Oromia through availing financial services to the poor and assist them to make the best use of indigenous resources and knowledge.
OMO Microfinance S.C (or OMO)	SNNPR		OMO was legally registered by the National Bank of Ethiopia, according to Proclamation No.40/1996 in 1997.
PEACE MFI S.C (Poverty Eradication and Community Empowerment)	Ethiopia		

Source: adapted from Ethiopian micro-finance institutions accessed March 2018.

Some of the key challenges of Mobile Banking are: High rates of illiteracy are a serious problem for the adoption of Mobile banking services because this hinders that citizens cannot read, write and understand the basic operation of the services, Lack of awareness on the benefits of new technologies, Fear of risk from the customer side and Lack of enough trained manpower from the industry side (Worku 2010).

Having this in mind, the objective of this study is to identify the factor that hinders of the adopting the mobile banking services by customers specifically M-Birr users to increase customer satisfaction which will lead us to suggest a conceptual framework by extending the diffusion innovation theory of Rogers(1995).

The contribution to theory and practices, the final findings will help to infer in the theoretical construction of the framework on the adoption of Mobile Banking technology. In practice, the finding will help bankers and agents to identify the key factors that influence the adoption of mobile banking services and helps to the company so as to identify what are the potential needs of customers to obtain competitive advantages as good as to create a more serious decision for better client services.

The structure of the paper is organized as follow: Part II Literature review; Part III Theoretical framework; Part IV Research Design; Part V Findings and Analysis; Part VI Limitation of the study; Part VII Discussion and Conclusion finally, Reference part which contains, different sources used for this research.

2. LITERATURE REVIEW

It is defined that mobile banking as, an application of mobile devices that helps a customer to make a transaction at any time and any place. Since, mobile banking enables the customer to connect to a server, perform authentication, authorization and make mobile payment users attitude and their intention to use mobile banking technology becoming important for researchers to deal on it. This is because financial institutions like banks want to get a real advantage from mobile banking by addressing the key factors that affect the intention to use Mobile banking technology (Lin 2011). For this, the study used different dependent and independent variables to investigate the factors affecting customer behavior form mobile banking usages like compatibility, complexity and relative advantage from innovation diffusion theory. And, with integrating additional independent variables services quality, confidences and trialability which are mediated by attitude and this lead to a dependent variable called intention to use.

2.1. Innovation Diffusion Theory

The intrusion diffusion theory(IDT) was proposed by Rogers (2003)which could be considered as one of the most popular theory have attempted to explore factors that affect an individual to adopt an innovation or a new technology. IDT is a theory that seeks to explain how, why, and at what rate new ideas and technology spread through cultures. Rogers defines diffusion as the adoption of an innovation “over time by the given social system”, as a consequence diffusion processes result in the acceptance or penetration of a new idea, behavior, or physical innovation. According to IDT, the adoption rate of a new technology depends on five characteristics of the innovation, namely relative advantage, compatibility, complexity, observability, and trialability. Except for complexity, which has a negative relationship with the adoption rate, the other characteristics positively affect adoption intention of innovative technologies (Lin, 2011). A summary literature review on innovation diffusion theory for mobile banking technology with their methodology and findings are presented in table 2. Table2. Some list pieces of literature from the previous work

Researcher	Context	Methodology	Construct Used	Key findings
(Lin 2011)	An empirical investigation of mobile banking adoption: The effect of innovation attributes and knowledge-based trust	innovation diffusion theory and knowledge-based trust	perceived relative advantage, ease of use and compatibility, perceived competence, integrity on attitude and behavioral intention	The results indicate that perceived relative advantage, ease of use, compatibility, competence, and integrity significantly influence attitude, which in turn lead to Behavioral intention to adopt (or continue-to-use) mobile banking.
(Yahaya et al. 2016)	Adoption of Islamic Banking Products and Services in Nigeria :	diffusion of innovation theory	relative advantage, compatibility, complexity and perceived risk alongside with awareness	The result indicates good internal consistency reliability of the measurement, Convergent and discriminant validity were also established.
(Dineshwar & Steven 2013).	investigate m-banking adoption and usage in Mauritius	diffusion of innovation theory and Technology Acceptance Model	access to banking services, Compatibility, observability, Complexity, Relative advantage, Awareness	Perceived security risk and reliability were found to be the main obstacles to m-banking usage. It was also found that m-banking usage is not associated with age, gender, and salary. There is, however, an association between education and m-banking usage.
(Sulaiman et al. 2007)	adoption of mobile banking services by consumers	diffusion of innovation theory	Innovators, early adopters, early majority, late majority, and laggards.	This study found that demographic factors do affect the adoption of mobile banking services. Which is found that males are more willing to adopt new technology than females.
(Mullan et al. 2017)	Explore drivers and barriers of bank adoption of mobile banking from a stakeholder perspective.	Diffusion of Innovation (DOI)	Global mobile phone penetration, competitive advantage, customer convenience, strategic importance, customer demand, low perceived risk/security concerns, and stakeholder partnerships.	consideration needs to be given, not only to the specific features (attributes) of mobile banking (relative advantage, compatibility, and trialability) but also to its enabling environment (formation of partnerships, competition and demand uncertainty) in order to have a full understanding of mobile banking adoption
(Dzogbenuku 2013)	influence the adoption of mobile banking innovation among university students in Ghana	Diffusion of Innovation (DOI)	relative advantage, compatibility, observability, complexity, perceived risk, trialability, and service satisfaction	The survey confirmed that observability, as well as complexity, indicated a weak negative correlation and weak positive correlation respectively. Moreover, there is no correlation between the relative advantage, Compatibility, perceived risk as well as trialability.
(Al-Jabri, 2016)	To examine the perceived differences between men and Women towards mobile banking services.	diffusion of innovation	relative advantage, complexity, compatibility, observability, and trialability used to explore gender differences in relation to mobile banking.	The finding shows there were no significant differences in complexity, trialability, and risk.
(Johnson 2018)	To investigate the impact of factors influencing m-payment service adoption	Diffusion of innovation theory	relative advantage, ease of use, visibility, perceived security, privacy risk, Ubiquity trialability,	ease of use, relative advantage, trialability, visibility and perceived security positively influence the individual's intention to use m-payment services. while concerns over privacy risks negatively influence perceptions of security.

(Al-Jabri & Sohail 2012)	examining factors affecting the mobile banking adoption	Diffusion of innovation theory	Relative Advantage, Complexity, Compatibility, Observability, Trialability, Perceived Risk	It is found that relative advantage, compatibility, and observability have a positive impact on adoption. Contrary to the findings in the extant literature, trialability and complexity have no significant effect on adoption. Perceived risk has a negative impact on adoption.
(Akturan and Tezcan 2010)	determine the effect of innovation characteristics on mobile banking adoption intention.	Diffusion of innovation theory	Relative advantage, compatibility, complexity, image, result demonstrability, visibility, trialability, and voluntariness	The results provide support for the theoretical relationship between the relative advantage and compatibility, and mobile banking adoption. However, no relationship was found between image, result demonstrability, complexity, trialability, and adoption intention.
(Lemma, 2018)	to identify and examine the factors that influence the adoption of mobile money service.	Unified Theory of Acceptance and Use of Technology (UTAUT)	Convenience, Cost, Security, Reliability of the service, Comfort with Electronic money, User friendliness or ease of the service, Knowledge of the service,Accessibility of the service in any phone type.	available services on M-Birr', 'knowledge of service', and 'convenience' factors were the most standout factors
(Laekemariam Haile, 2015)	To identify factors influencing the adoption and usage of mobile banking	Unified Theory of Acceptance and Use of Technology (UTAUT	Performance expectancy, Perceived risk, Perceived cost, Effort expectancy, Trust, Mobile banking service quality and Behavioral intention items	Performance expectancy,Effort expectancy and trust were found to have positive and significant influence on mobile banking adoption - perceived risk and perceived cost has negative and significant influence on mobile banking adoption - Service quality is the only not significant predictor which influences the mobile banking adoption
(Bultum, 2014)	to identify factors that affect adoption of E-banking in the Ethiopian banking industry.	technology-organization-environment model (TOE)	security risk, lack of trust, lack of legal and regulatory frame work, Lack of ICT infrastructure and absence of competition between local and foreign banks.	the major barriers Ethiopian banking industry faces in the adoption of Electronic banking are: security risk, lack of trust, lack of legal and regulatory frame work, Lack of ICT infrastructure and absence of competition between local and foreign banks.

3. THEORETICAL FRAMEWORK

3.1. Theoretical Background and Hypothesis Development

A theoretical framework is a conceptual model of how someone posits the relationships among the various factors that have been recognized as vital to the problem (Sekaran 2003). This study used the innovation of diffusion theory (IDT) explained by Rogers (1995) as to how the community accepts the original innovative concepts and how they decided.

The degree of adoption of technology can be affected by the attributes of innovation. Some technologies (systems) can be adapted or gained approval in a short time but others need a lot of time. According to Kotler (2000) explained that "If the innovation is perceived to be better than the existing system (a measure of its relative advantage), is consistent with the needs of the potential adopter (a measure of its compatibility), and is easy to understand and use (a measure of its complexity)".

This section discussed the role of attitude (see in the literature review part) which affects adoption to use M-Birr money transfer technology in Ethiopia. This study used M-Birr technology as a target and tests the influence of confidence (trust) and Service quality with attributes of innovation diffusion theory on acceptance of M-Birr money transfer.

There are seven hypotheses in this study and this study includes the variables of an innovation diffusion theory and other variables. These are:

1. Users attitude & adoption of technology

Attitude is a tendency to reply positively or negatively towards a specified idea, object, person or situation and impacts a person's need for action. When adopting technology the concept of intention to use technology is important to the research area in the information system field. This study measures the intention to use M-Birr technology as users' attitude concerning those variables namely confidence, service quality, compatibility, complexity, trialability, and relative advantage. The variables have input in determining the attitude of the individuals in using the new system.

H1. User attitude has a positive effect on adoption to use the M-Birr technology

2. Confidence

Confidence refers to the assurance and users' perceptions of service providers' ability, transparency of agents and helps customers solve perceptions of doubt and threat (Siau & Shen 2003). Confidence is taken as a major part of mobile Birr technology as customers are giving their phone number during the subscription. Confidence will be built when good communication existed between agents and service providers. Confidence affects the customers' attitude to use the technology in the long run. When such confidence is built the customers creates a secured feeling and suggests the service to other individuals (Lin et al. 2006). When one is using technology for different activities especially for money transfer tasks it needs to be the focus on confidence-building mechanisms like the issue of security and privacy (Howcroft et al. 2002; Hosein 2011).

H2. Confidence positively affects the attitude towards using the technology

3. Service quality

Service quality refers to the quality of information exchanged across a medium, reliability, accuracy, personalization(Laekemariam Haile, 2015). In the context of mobile, the content refers to information, features, or functions that are offered via mobile banking services. Such content should be constructed logically to help the user find information and incorporate features such as accuracy, timeliness, relevance, and flexible presentation(Laekemariam Haile, 2015). The technology service quality (reliability & responsiveness) influences the users' attitude to use the M-Birr service. It used for agents to compete with other technology providers (Yoo & Park 2007). The customer attitude to use the technology will increase based on the innovativeness (best service quality) of the technology (Babakus et al. 2004).

That means the two are positively correlated.

H3. Service quality has a positive effect on attitude

4. Compatibility

Perceived compatibility is the degree to which an innovation fits the values, previous experiences, and needs of the potential adopter (Rogers,2003). The compatibility between the customers/users and the technology has to be compatible in terms of easily interpreted in a more familiar context.

Therefore, compatibility in this study context is that customers perceive mobile banking services observes as compatible with their lifestyle and preferences, and thus adopt a favorable attitude towards adopting (or continuing to use) mobile banking. Generally, It is the extent to which an innovation is perceived as consistent (steadily match) with the existing principles, previous practices, and needs of possible adopters (Rogers 2003). When if it coexists with the previously existing business process of the organization. It answers whether it is fit for the concerned users.

H4. Compatibility of M-Birr positively affects the attitudes towards using M-Birr

5. Complexity

Complexity in the context of this study refers to a customer do not need to expend significant effort in using mobile banking due to easy to use. The term complexity in DOI which is similarly termed as Perceived ease of use in Technology acceptance model is defined as the degree to which mobile banking is perceived as easy to understand and operate (Lin, 2011). A study conducted by () found a direct relation between less complexity or easy to use. Therefore, due to mobile banking services having very user-friendly interfaces, customers are likely to see them as easy to use, and hence to have positive attitudes towards them. Generally, complexity is the extent to which an innovation is perceived as somehow challenging to recognize and use (Gerrard & Cunningham 2003). If the innovation is easy to use it will be adopted easily. It answers whether innovation is complex or not. It takes into consideration like user interface, user-friendliness of domain names and navigation tools (Cooper and Zmud 1997). This variable is vital for the adoption of mobile banking and payment (Koenig-Lewis 2010).

H5. The complexity of use of M-Birr positively affects the attitudes towards using M-Birr.

6. Trialability

The extent to which the innovation can be examined before the adoption was made (Tan & Teo 2000). This may include seeing some portion of the technology or having the chance to see others using new technology. This is consistent with Arvidsson (2014) suggestion that adoption is a learning experience and the more the user can learn about the technology, the more comfortable they will become, and the more likely they are to adopt. therefore, based on the current study context and previous literature trialability is positively related to the likelihood of adoption.

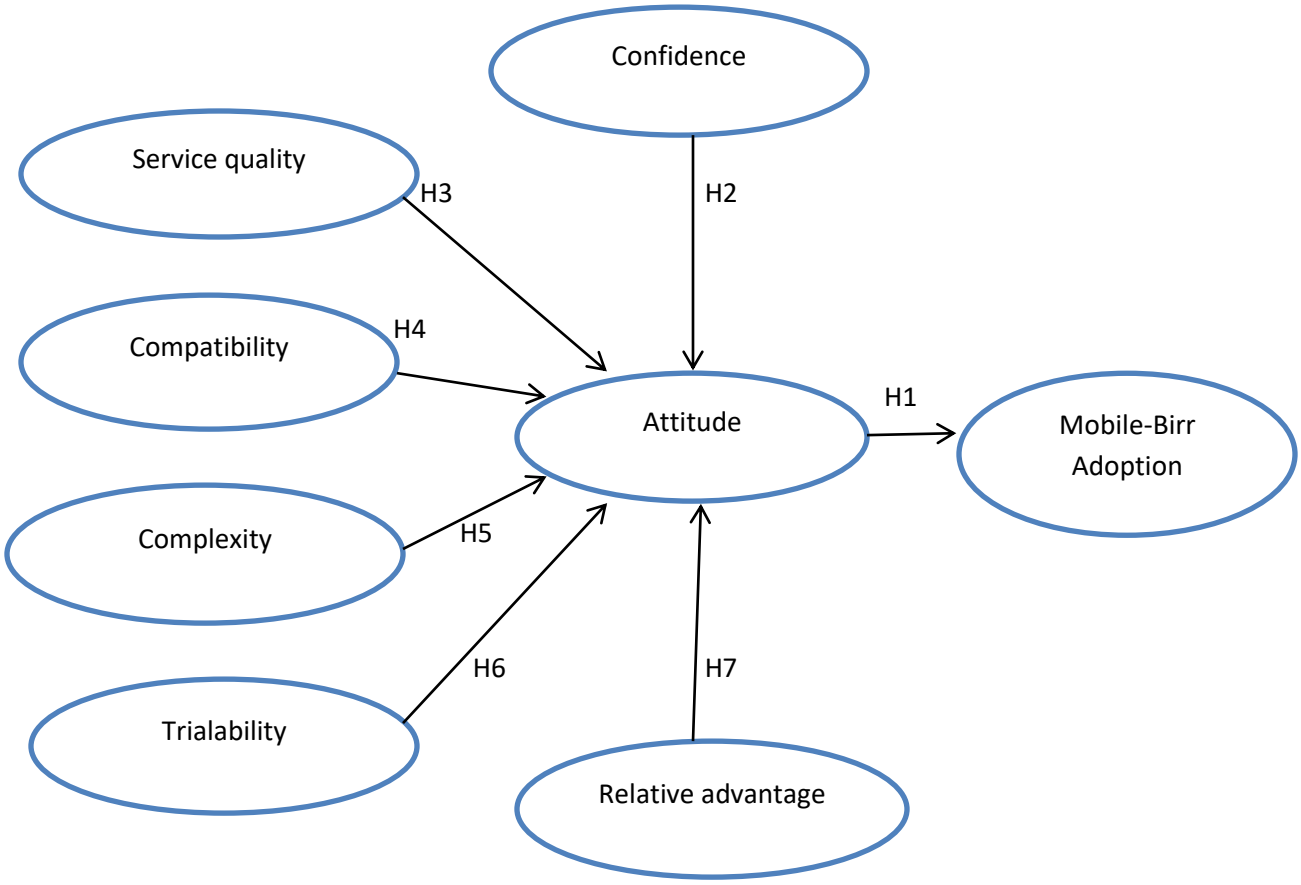
H6. Trialability of technology positively affects the attitudes towards using M-Birr.

7. Relative advantage

The relative advantage in this study context is the degree a user believes mobile banking more advantageous than the other banking services, Like ATM, SMS messages, and traveling to banking branch offices. These benefits include allowing customers to accomplish their banking transactions more quickly, accessing at any time and anywhere. Then when a customer found mobile banking is more quickly than of the others this leads to directly related to adopting the mobile banking technologies. Relative advantage is the degree to which an individual perceives a new innovation to be better than the precursor to that innovation which may include increased efficiency, economic benefits, and enhanced status (Rogers, 1995). A study conducted by(Johnson, Kiser, Washington, & Torres, 2018)reported relative advantage has a positive relation with mobile payment user. Therefore, the extent to which an innovation is understood as better than the software, technology or product it substitutes (Lau 2002). Relative advantage has elements like cost, time-saving, social status, value (effort) and integration of technology (Rogers 2003).

H7. The relative advantage of using M-Birr positively affects the attitude towards using technology. The research model for this study looks like

Figure1. A conceptual model for M-Birr in Ethiopia



This study had seven primary links between the constructs involved in attitude towards to use M-Birr technology as shown in figure 1 above.

The first link (H1) suggests the effect of attitude on the intention to use. The second link, hypothesize confidence affects the attitude. The third link, innovativeness affects attitudes. The fourth, fifth and sixth link suggests the antecedents of attitude towards the use of the technology. The last link showed relative advantage affects the attitude of the customer. Therefore; the research integrated IDT with service quality and confidence to investigate the main factors influencing mobile Birr money transfer adoption.

3.2. Research Design

The general objective of this study is to examine the factors that influence the usage of M-Birr adoption in Addis Ababa, Ethiopia. The research method is quantitative which uses primary data to

answer the research questions and achieve the objectives. This method uses statistical methods in describing patterns of attitude and generalizing findings from samples to the population of interest and employs strategies of analysis (Creswell 2003).

To answer the research objectives, this study used both descriptive and explanatory method to explain the factors influencing M-Birr adoption in Addis Ababa, Ethiopia. The primary purpose of explanatory research design is to decide how events occur and which ones may influence particular results (Dawson & Bob 2006).

3.3. Target Population and Sample Design

In this study, the target population is comprised of customers of M-Birr service in Addis Ababa, Ethiopia. For the sampling design, purposive sampling is used to select service providers and agent branches based on their level of business activities to get customers easily. The reason behind such a sampling design is to get a higher number of customers in a few places within a short period of time. Ten 'woredas' from each of the ten sub-cities, five Showa shopping centers, and three Total oil places were selected in the city using purposive sampling technique. And from the above purposively selected of each places random sampling techniques were applied for sample respondents (M-Birr customers).

To decide the sample size, there are different suggestions from different Authors. To conduct quantitative research 150 and above response is needed (Anderson & Gerbing 1984). This study was conducted based on MacCallum et al. (1996) suggests that a sample size of 200 is good for various types of statistical analysis.

3.4. Data Collection Method

A closed-ended questionnaire was used to collect data on mobile phone users' of their adoption to using M-Birr service based on IDT and the added variable of confidence and service quality. The closed-ended questionnaires were established based on prior studies. To ensure the content validity, the instruments which measure the constructs are adapted from different sources with carefully changed to match the M-Birr money transfer adoption context in Ethiopia as shown from table1. E.g service quality is measured by items taken from Shin & Kim (2008), confidence is measured by items adapted from Gefen et al. (2003) and attitude as a mediator variable. After developing the preliminary questionnaires, the pretest conducted using two M-Birr customers and M-Birr agent professionals, feedbacks were collected and then revised the ambiguities based on

the suggestion given. All the items are measured based on the five-point Likert scale with anchors ranging from 5 (strongly agree) to 1 (strongly disagree).

Table3. The initial measurement items and their sources

Factor/Construct	Construct Code	Item	Source
Service Quality	SQ	M-Banking service provider always delivers excellent overall service. The offerings of the service provider are of high quality. The M-Banking service provider delivers superior service in every way.	(Shin and Kim 2008)
Compatibility	CP	Using virtual store fits well with the way I like to control and manage the transactions	(Chen et al. 2002)
Complexity	CL	Interaction with internet banking does not require a lot of mental effort	(Gerrard and Cunningham 2003)
Attitude	ATT	Based on the mentioned factors, what would be your tendency to adopt the technology?	(Paternoster & Simpson 1996)
Relative Advantage	RA	Mobile banking is more accessible than other banking types.	(Taylor and Todd 1995)
Trialability	TA	I have tested the application of the internet banking system before use.	(Tan and Teo 2000)
Confidence	CF	I believe the M-Banking service provider is honest. I believe the M-Banking system can be trusted.	(Gefen et al. 2003)
Adoption of technology	ADT	Based on the described scenario, what would be your chance of doing?	(Rogers 2003)

The seven constructs were measured to access users' attitude to use the adopted innovations. This study used the population from customers of M-Birr service in Addis Ababa, Ethiopia. The questionnaires were sent to the respondents in different locations of 'woredas', Total oil & Showa shopping centers using random sampling technique 20 questionnaires were sent to each of the centers/locations. That means a total of 360 questionnaires were distributed, and the time given to fill the questionnaires was within 20 days from the delivered date. After this, a total of 211 responses were collected with a response rate of 58.6%. But after filtering incomplete & ambiguous responses a total of 203 usable responses were remaining.

4. FINDING AND ANALYSIS

Simple regression is applied to address one independent variable relationship with the dependent variable of M-Birr adoption. On the other hand, multiple regression analysis is also applied to address all variables relationship together with the dependent variable (Hair et al. 2006).

The inferential statistics are used to examine the relationship and the direction of the relationship between confidence and M-Birr adoption, service quality and M-Birr adoption and compatibility and M-Birr adoption and complexity and M-Birr adoption and relative adoption and M-Birr adoption and trialability and M-Birr adoption which are part of the objective of the research.

Table 4. Demographic Profile

Variable	Category	Frequency	Percent
Gender	Male	135	0.67
	Female	67	0.33
Age	18-29	53	0.26
	30-50	131	0.65
	Above 50	18	0.09
Highest level of Education	Certificate	03	0.01
	Diploma	45	0.22
	Degree	127	0.63
	Masters	27	0.13
	Doctorate	-	
Time to get to the nearest M-Birr Agent	Less than 20 Minutes	43	0.21
	Less than 40 Minutes	125	0.62
	more than 60 Minutes	35	0.17

Table 4 shows the respondents demographic profile. About 77% of the respondents were male and 33% were females. With respect to the age range from 18-29 were 26%, 30-50, 65% and above the age of 60 were 9%. Next, the demographic category called the highest level of Education which was Certified 1%, Diploma 22%, Degree 63%, Masters 13% and none for Doctorate. Finally, we used 'Time to get to the nearest M-Birr Agent' to understand the distribution of M-Birr agents to customers and accordingly it was found that who access/ reach Less than 20 Minutes 21%, Less than 40 Minutes 62% and more than 60 Minutes 17%. Based on this it can be concluded that the most M-Birr customers are males in the age of 30 to 50 who are most degree holders with time to get nearest M-birr agent less than 40 minutes.

4.1. Assessment of Measurement Model

The smart partial least squares (SmartPLS) approach was used to evaluate the measurement scales and to test the research hypotheses proposed in this study. The SmartPLS is appropriate for this study because the PLS focuses on the prediction of data and is well suited for exploratory models and theory development. The Smart-PLS software package (version 3.2.1) was used for the estimations. The measurement qualities of reflexive constructs were assessed by examining the convergent validity, individual item reliability, composite reliability, and discriminant validity of the measurement model (Barclay et al. 1995). Since the measures of all constructs had adequate reliability and validity assessments, all of the measurement items of these constructs were kept for testing the structural model. Subsequently, the researchers were estimated the structural model to test the research hypotheses.

First, to test the measurement model one can to take four measurements into consideration first ensure the individual item reliability and convergent validity of constructs, the researchers examined factor loadings of individual measures on their respective constructs, as well as the average variance extracted (AVE). To ensure internal consistency among the items included in each of the scales, Cronbach's coefficient alpha is estimated. Higher Alpha coefficients indicate higher scale reliability. Specifically, George & Mallery (2003) suggested that scales with 0.60 Alpha coefficients and above are considered acceptable. All the measurement item loadings on respective constructs were above the recommended minimum value of 0.60 and thus indicating that at least 50 percent of the variance was shared with the construct (Chin 1998) as shown in appendix 3. The AVE values for all reflexive constructs were greater than the minimum recommended value of 0.50 as shown in appendix 4, indicating that the items satisfied the convergent validity i.e. how much of the indicators cover the construct's meaning (Hair et al. 2011).

Second, to ensure the discriminant validity of constructs in the research model, the square root of the average variance extracted (AVE) for each construct was compared with the other correlation scores in the correlation matrix. The square root of the AVE for each construct in the model, as reported in the diagonal of the correlation of constructs matrix in Appendix 5, was larger than the corresponding off-diagonal correlations of the constructs to their latent variables.

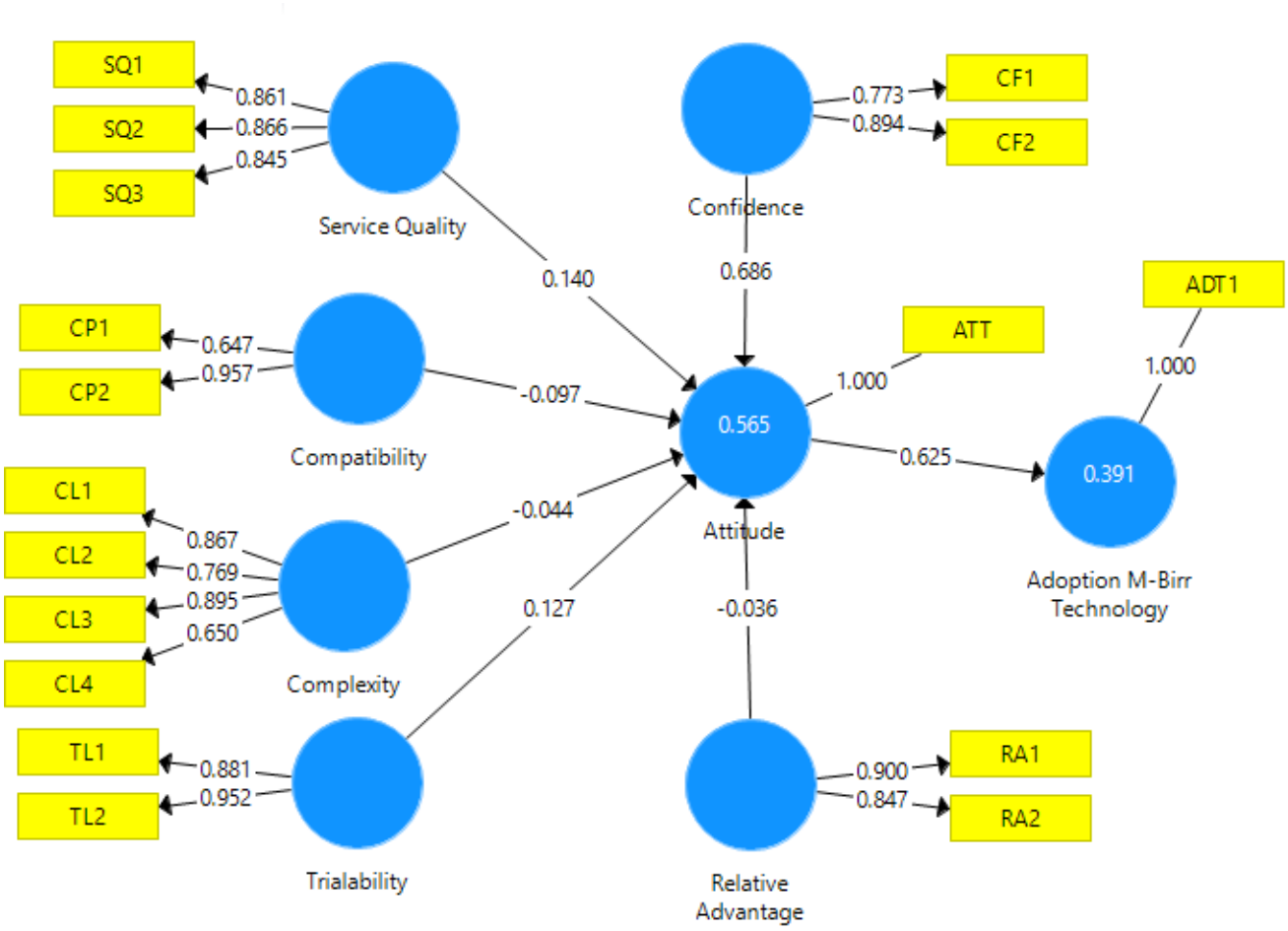
It also performed the confirmatory factor analysis and examined the cross-loadings of the items on other constructs and found that the entire measurement item loadings on the intended constructs were above 0.78 and was at least 0.1 less on their loadings on other constructs (Gefen and Straub 2005) as it is shown in appendix 4.

4.2. Assessment of Structural Model

From the six constructs Relative Advantages, Complexity, Compatibility, Confidence, Service quality, Trialability as the independent variables and Attitude as the dependent variable. As P is less than 0.05, the model is significant. Thus the combination of the variables significantly predicts the dependent variable. The t and p values present the significance of each variable and their impact on the dependent variable (attitude). Only trialability, confidence, service quality, and attitude had a significant impact on the respondent's attitude, with the confidence having the highest impact on attitude.

The measurement of the structural model was estimated using the same tool i.e. a PLS approach to structural equation modeling. The PLS algorithm and the bootstrapping sampling method were used to estimate the structural model. The results of the model estimation, including standardized path coefficients and the number of variances explained (R2), are presented in Figure 2.

Figure 2. Structural model of the study



Based on the significant path coefficients, the hypotheses of trialability, confidence, service quality, and attitude were supported ($p < 0.01$). The contributions of these factors were significant in explaining the variance in the adoption of M-Birr technology.

Approximately 39.1 percent of the variance was explained for the adoption of M-Birr technology. In the variance explained by the IDT constructs, attitude accounts for 56.5 percent of the variance explained in the adoption of M-Birr technology as shown in Appendix 6. When it has been looked at the weights using t-test value (i.e $t > 1.92$) for trialability, confidence, service quality and attitude of these dimensions found that they are significant. Suggesting that, this dimension significantly contributes to the attitude. For relative advantage, compatibility and complexity are

non-significant and the hypothesis given for them is not supported or should be hypothesized in a reverse way.

It can be seen that R square value for the adoption of M-Birr (i.e. 0.391) is on the range of 0.33 so this is average (Chin, 1998); hence the variance in the model can be moderately predicted from the independent variable, attitude. When it is seen the general significance of the model, as P is less than 0.05, the model is significant. Thus, an attitude of the respondents can significantly predict the dependent variable, adoption of M-Birr. The small t value and corresponding large p-value show the coefficients of attitude have a very big impact on adoption.

The study conducted based on the analysis suggested by Baron and Kenny (1986) to test the mediating effect of attitude on the adoption of M-Birr technology. Therefore, the mediation analysis was performed to determine if full or partial mediation effects are present. According to the test results, the coefficients for each independent variable are significant, satisfying the condition to test mediation role of attitude the research model hypothesizes that service quality, complexity and relative advantage influence adoption of M-Birr completely through attitude (full mediation effect of attitude) while attitude partially mediates the effects of relative advantage, complexity, and compatibility on adoption of the technology.

Hypothesis (H2) which is confidence has positive result towards attitude which follows for the use of M-Birr technology. Hypothesis (H3) which is Services Quality positively supports the attitude towards the use of M-Birr technology. However, Hypothesis (H4) which is Compatibility did not support by this result. The Compatibility of the existing M-Birr technology with individual existing values does not affect the attitude to have a positive link to M-Birr adoption. Hypothesis (H5) which is Complexity has also negatively affected the attitude which means the result shows Complexity of the technology with individual existing values and needs does influence him or her to form a positive attitude toward M-Birr Technology. This may indicate that innovation is not easy to use and it is not adopted easily. Which considers user interface, user friend-ness of domain names and navigation tools are not easily navigated. Trialability which is Hypothesis (H6) was positively related to attitude toward M-Birr technology. Based on hypothesized (H7), the Relative advantage has a negative effect on attitude towards adoption of M-Birr technology. This is a relative advantage has a lower standardized coefficient as compared to other variables which mean this has a less contribution to attitude for using M-Birr technology.

5. LIMITATION OF THE STUDY

In the Information systems study, there are a number of theories used for different research. In this research, it is limited to the diffusion of innovation theory as a guideline to test the M-Birr technology adaptability by its customers of these microfinance agents and the respondents are only customers currently using the M-Birr Technology. In the methodology section, this study follows the deductive approach called quantitative methods where questioners were distributed for M-Birr agent customers of Addis Ababa city only.

6. DISCUSSION AND CONCLUSION

The analyses were conducted using statistical software called Smart PLS and the statistical results are presented using tables, charts, and figures and also the data collected were analyzed using Cronbach's alpha which was to determine the internal consistency and reliability. It is used in this study because every item in the questionnaire measured an underlying construct. The validity of the measures was verified by observing the correlations between the items on the various scales. All pre-existing constructs used in the diffusion theory met the criteria of validity.

For confidence, it refers to the assurance and users' perceptions of service providers' ability, transparency of agents and helps customers solve perceptions of doubt and threat is not a big issue of the user of the M-Birr technology. For service quality, it is with the assumption of the customer getting better quality by the M-Birr Technology agent this might be with competing with other technology providers. For trialability, this may include seeing some portion of the technology or having the chance to see others using new technology. But the remaining constructs' hypothesis was not supported it is not needed to spend more time and resources there.

Finally trialability, services quality, and confidences are significant to attitude. Agents are required to exploit these factors to form a positive attitude toward M-Birr technology among their customers. The attitude which is the hypothesis (1) found that has positively related to Adoption of M-Birr Technology, and this suggestion is positively treated the M-Birr technology leads to adopting by individuals. So, the formation of attitude to the M-Birr technology has to take place.

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Appendixes

Appendix 1: Questionnaire for demographic assessment

ADDIS ABABA UNIVERSITY

IT DOCTORAL PROGRAM

INFORMATION SYSTEM TRACK

Dear Respondent,

The aim of this questionnaire is to identify the Factors Influencing the Usage of M-Birr money transfer in Addis Ababa, Ethiopia. We would like to assure you that the information you provide will be used only for academic use.

Thank you in Advance for your kind cooperation in filling up this questionnaire.

Section A

Table 5. demographic value of the respondents

No	User Demographics	Categories	Mark applicable with a cross (X)
1	Gender	Male	
		Female	
2	Age	18-29	
		30-50	
		51-Above	
3	Highest level of education	Certificate	
		Diploma	
		Degree	
		Masters	
		Doctorate	
4	Time to get to the nearest bank	Less than 20 minutes	
		Less than 40 minutes	
		More than 60 minutes	

Appendix 2: Questionnaire for assessing M-Birr adoption
Factors for Usage of M-Birr

Please indicate the extent of your level of agreement and disagreement with the following statement. Please tick (x) for your appropriate answer based on the following rating. 1 to 5. 1 strongly disagrees, 2 disagrees, 3 is neutral, 4 agrees & 5 is strongly agree.

Table 6. Measurement instrument (items) for variables

Statement to evaluate		**Rating Point**				
		1	**2**	**3**	**4**	**5**
Relative Advantage						
1	M-Birr is faster than visiting a bank or using internet banking.					
2	M-Birr is more accessible than other banking (e.g. visiting a bank or using internet banking)					
Compatibility						
3	Using M-Birr fits well with the way I like to control and manage my transactions.					
4	I use the M-Birr service because these are already a part of my daily life.					
Attitude						
5	I believe my attitude based on those scenarios affects to accept M-Birr technology.					
Confidence						
6	I believe M-Birr agents are delivered confidential services.					
7	I have confidence in the usage of M-Birr service.					
Service Quality						
8	M-Birr service provider always delivers excellent overall service.					
9	The offerings of the service provider are of high quality.					
10	The M-Birr service provider delivers superior service in every way.					
Complexity						
11	Learning to use M-Birr service would be easy					
12	Interaction with M-Birr does not require a lot of mental effort					
13	It is easy to use M-Birr service to accomplish my transaction					
14	Use of M-Birr does not require Training					
Trialability						
15	I have tested the application of M-Birr system before use.					
16	I agree with the experiment of M-Birr technology usability.					

Appendix 3:
Table 7. Indicator reliability values

Outer Loadings

Matrix | Confidence Intervals | Confidence Intervals Bias Corrected | Samples

	Original Sampl...	Sample Mean (...	Standard Devia...	T Statistics (|O...	P Values
ADT1 <- Adopt...	1.000	1.000	0.000		
ATT <- Attitude	1.000	1.000	0.000		
CF1 <- Confide...	0.773	0.773	0.045	17.220	0.000
CF2 <- Confide...	0.894	0.895	0.020	45.740	0.000
CL1 <- Comple...	0.867	0.864	0.021	41.973	0.000
CL2 <- Comple...	0.769	0.763	0.051	15.143	0.000
CL3 <- Comple...	0.895	0.893	0.019	47.448	0.000
CL4 <- Comple...	0.650	0.654	0.060	10.890	0.000
CP1 <- Compa...	0.647	0.637	0.114	5.685	0.000
CP2 <- Compa...	0.957	0.954	0.028	34.269	0.000
RA1 <- Relative...	0.900	0.900	0.018	48.896	0.000
RA2 <- Relative...	0.847	0.848	0.032	26.603	0.000
SQ1 <- Service ...	0.861	0.860	0.027	32.425	0.000
SQ2 <- Service ...	0.866	0.865	0.022	39.770	0.000
SQ3 <- Service ...	0.845	0.845	0.022	38.532	0.000
TL1 <- Trialabil...	0.881	0.880	0.023	37.675	0.000
TL2 <- Trialabil...	0.952	0.953	0.010	92.692	0.000

Appendix4:

Table8. Composite reliability and Average Variance Extracted (AVE)

Construct Reliability and Validity

Matrix | Cronbach's Alpha | rho_A | Composite Reliability | Average Variance Extracted (...

	Cronbach's Al...	rho_A	Composite Rel...	Average Varian...
Adoption M-Bi...	1.000	1.000	1.000	1.000
Attitude	1.000	1.000	1.000	1.000
Compatibility	0.743	0.954	0.795	0.668
Complexity	0.809	0.827	0.876	0.642
Confidence	0.795	0.626	0.822	0.699
Relative Advan...	0.694	0.712	0.866	0.764
Service Quality	0.820	0.820	0.893	0.735
Trialability	0.820	0.934	0.914	0.841

Appendix 5:

Table 9. The discriminant validity of the study

Discriminant Validity

Fornell-Larcker Criteri... | Cross Loadings | Heterotrait-Monotrait R... | Heterotrait-Monotrait R... | Copy to Clipboard: | Excel Format | R Format

	Adoption M-Bi...	Attitude	Compatibility	Complexity	Confidence	Relative Advan...	Service Quality	Trialability
Adoption M-Bi...	1.000							
Attitude	0.625	1.000						
Compatibility	0.306	0.344	0.817					
Complexity	0.430	0.452	0.751	0.801				
Confidence	0.635	0.739	0.503	0.614	0.836			
Relative Advan...	0.505	0.575	0.606	0.650	0.761	0.874		
Service Quality	0.333	0.500	0.703	0.729	0.620	0.680	0.858	
Trialability	0.381	0.485	0.412	0.544	0.552	0.640	0.474	0.917

Appendix 6:

Table 10. The coefficient of determination (R^2) value of the study

R Square

Matrix | R Square | R Square Adjusted

	R Square	R Square Adjus...
Adoption M-Bi...	0.391	0.388
Attitude	0.565	0.551