An Integrated Study on the Aspects Embracing e-Commerce Platforms in Bangladesh

An Integrated Study on the Aspects Embracing e-Commerce Platforms in Bangladesh

A thesis submitted to the Institute of Information Technology (IIT), University of Dhaka in partial fulfillment of the requirements for the degree of Doctor of Philosophy

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Declaration

I hereby declare that this study is my work, presented to the Institute of Information Technology (IIT), University of Dhaka towards the fulfillment of the requirements for the degree Doctor of Philosophy (PhD) and that, to the best of my knowledge; it contains no material previously published by another person nor material which has been accepted for any award or any other degree of any University, except where due acknowledgment has been made in the text.

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Abstract

The thesis focuses on different facets of effective adaptation of e-commerce in the context of Bangladesh. Since the inception in 2006, Bangladesh has shown incredible growth potential in e-commerce. However, recent statistics shows that Bangladesh is still lagging behind in the field of e-commerce. Therefore, it is very necessary to identify the factors that affect the adoption of ecommerce in Bangladesh which motivates to carry out this research. In doing so, the thesis concerted on three specific sub segments of e-commerce, mobile financial services (MFS), internet banking, and online marketplaces. The study followed a mixed method approach combining both qualitative and quantitative methods with a positivist philosophy. Quantitative data are gathered via three different questionnaire survey. Three conceptual frameworks are developed and validated using both qualitative and quantitative data. The thesis makes a novel contribution by identifying and analyzing the important factors of e-commerce adoption in Bangladeshi context and proposing an extension of Technology Acceptance Model (TAM) with five new constructs. The new constructs are: Value perception, Perceived risk, Customer Service, Technology Familiarity and Trust, which are context specific from Bangladesh perspective. Findings of the thesis suggests that, 'Perceived Risk' have a negative effect on the adoption of all three sub segments. On the other hand, factors like 'Value perception', 'Customer Service', 'Technology Familiarity', and 'Trust' are also found to have positive effect on the adoption of e-commerce. 'Trust' and 'Adoption Confirmation' are found to have positive impact on customer satisfaction as well. These findings are substantiated with consultation with the industry practitioners. Thus, the research achieves its objectives and fills up the academic gap in the area of e-commerce study by extending TAM with five above mentioned Bangladeshi context specific parameters. It also made very important contribution to the industry by effectively connecting and associating the theoretical conclusion with the corporate objectives of different e-commerce businesses, and successfully interpreting them to be used for promoting their business progress. However, due to change in environmental context, such as any modification in laws and regulations, the proposed conceptual frameworks of the thesis may face adaptivity problem. Therefore, the frameworks may need to augment new constructs to observe the effect of such contextual change on e-commerce adoption behavior of the consumers in future.

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1. Amin, M. I., Erfan, N., Navid, M., Khan, M. S. A. & Islam M. S. (2022). An Application of TAM and TRI on the Factors Affecting Internet Banking Adoption in Bangladesh. *The Journal of Asian Finance, Economics and Business (JAFEB).* Volume-9, Issue-9, pages 75-91. Accessible through: https://doi.org/10.13106/jafeb.2022.vol9.no9.0075.

2. Amin, M. I., Khan, M. S. A. & Islam M. S. (2020). Analyzing Factors Affecting Adoption of Online Banking Among the Consumers of Dhaka City Using Technology Acceptance Model (TAM). *The Journal of Business Administration.* Volume-41, No. 1, pages 119-136.

3. Arifin, Z., Amin, M. I. & Khan, M. S. A. (2020). Assessment of Factors Contributing to Adoption of Mobile Financial Services: A Perspective of Bangladesh. *The Journal of Business Administration*.Volume-40, No. 2, pages 01-26.

List of abbreviations

B2B: Business-to-Business

B2C: Business-to-Consumer

BTRC: Bangladesh Telecommunication Regulatory Commission

CFA: Confirmatory Factor Analysis

DOI: Diffusion of Innovation

FGD: Focused Group Discussion

ICT: Information and Communication Technology

IDI: ICT Development Index

MFS: Mobile Financial Service

NRI: Network Readiness Index

SEM: Structural Equation Modeling

TAM: Technology Acceptance Model

TOE: Technology Organization Environment

TPB: Theory of Planned Behavior

TRA: Theory of Reasoned Action

TRI: Technology Readiness Index

UNCTAD: United Nations Conference on Trade and Development

TO MY FAMILY

1 Chapter 1: Introduction

This chapter states the research background, motivation, problem statement and objectives, scope, methodology, contribution and the overall structure of the thesis.

1.1 Introduction

Bangladesh, one of the Next Eleven or N-11 countries, identified by Goldman Sachs investment banker and economist Jim O'Neill, as having a high potential of becoming one of the world's largest economies in the 21st century (O'Neill, Wilson, Purushothaman, & Stupnytska , 2005). And to turn this potential into a reality, it is expected that Electronic commerce or e-commerce will contribute significantly and boost the country's economic growth.

E-commerce industry in Bangladesh is still at its neonatal stage with only 1% of total population and 8% of total internet users committing to online shopping (UNCTAD, 2019). Primary reason of the slow spread of E-commerce in Bangladesh is the late legalization of online payments only back in 2012 by Bangladesh Bank. However, since then it has been a rapid boom. The foundations for such a rapid boom can be attributed to the increasing smartphone and internet penetration in the country. As per Bangladesh Telecommunication Regulatory Commission (BTRC), the total number of internet subscribers reached 123.82 million at the end of December, 2021. The educated and tech savvy youth demography in Bangladesh has also been increasing who are considered the main targets of online shopping. All these factors together have been contributing to the rapid development of the e-commerce industry in Bangladesh.

However, comparing the e-commerce industry of Bangladesh with that of other countries it can be seen that Bangladesh is still at a very early stage. For example, Malaysia saw introduction to

internet in 1995 (Paynter & Lim, 2001) and within 2006, Malaysia had its first online retail platform named Lelong.my. Bangladesh on the other hand, as mentioned before, only saw its first online retail platform in early 2013 when 'Akhoni.com' and 'Ajkerdeal.com' were introduced.

The e-commerce sector has seen unprecedented growth in 2020 since the outbreak of COVID-19, making more people inclined to online shopping (International Trade Administration, 2021). As of 2019, there were approximately 2,000 e-commerce sites and 50,000 Facebook pages which delivered almost 30,000 products every day (Khan, 2020). Although only 15-20% of the deliveries are paid through mobile payment gateways and 80% of these deliveries are made in Dhaka, Chittagong and Gazipur (Khan, 2020). It indicates how the overall dependence is less in volume and only isolated to certain areas. The dependence on e-commerce is still less compared to other countries.

1.2 Motivation

Adoption of e-commerce in developing countries is not the same as that of the developed ones. It was identified in a number of studies that the rate of e-commerce adoption in micro, small, and medium sized firms of different developing countries is lower than that of the developed economies (Al-Bakri & Katsioloudes, 2015) (Dwivedi & Irani, 2009). E-commerce in developing countries is not gaining the same level of benefits as the developed countries. The e-commerce world is expanding as we speak, its sales saw a growth from 1336 billion USD in 2014 to 4206 billion USD in 2020 (Valentina, Ionescu, Liliana, Coman, & Duica, 2022). Agileintel Research estimates the larger global B2B e-commerce market was $15 billion in 2020 and will grow to over $35 trillion by 2025 (Rachel F. Fefer, 2022).

In Bangladesh, like other developing countries, millions of people now have access to the internet. However, the role of the internet in trade and commerce is still inadequate. Although growing steadily, the current size of the ecommerce market in Bangladesh is $2.0 billion after experiencing a 166% upwards growth. It is expected to reach $3.0 billion in 2023 as mentioned by business experts. There have been a lot of advancements in the field of e-commerce in Bangladesh. In a study, Islam (2018) found that Bangladesh has a great growth potential for both B2B and B2C e-commerce. But recent statistics shows that, Bangladesh is still lagging behind in the field of e-commerce. To measure the position of Bangladesh three indices have been used:

- UNCTAD B2C e-commerce index
- ICT Development Index and
- Network Readiness Index

The UNCTAD B2C E-commerce Index measures an economy's preparedness to support online shopping. The index consists of four indicators: account ownership at a financial institution or with a mobile-money-service provider (percentage of population of 15 years or more), individuals using the internet (percentage of population), postal reliability index, and secure internet servers (per 1 million people).

The IDI is a composite index that combines 11 indicators into one benchmark measure that can be used to monitor and compare developments in ICTs between countries over time. These 11 indicators are grouped into three sub categories: ICT Access, ICT Use and ICT Skills.

Finally, the Network Readiness Index (NRI) is a framework, which assesses the factors, policies, and institutions that empower a country to fully leverage information and communication

technologies for inclusive, sustainable growth, competitiveness, and well-being. The NRI framework consists of four variables: Technology, People, Governance, and Impact.

Based on the above mentioned indices the rank of Bangladesh is shown in the following table.

Table 1: Ranking of Bangladesh in terms of e-commerce adoption

Index	Rank in 2019	Rank in 2022	Total no. of countries in the index
UNCTAD B2C e-commerce index	103	115	152
ICT Development Index	147	145	175
Network Readiness Index	101	95	130

Therefore, it is evident from the above table that, despite the growth potential, e-commerce based business platforms are still struggling and thus stimulating the need of conducting research on the field of e-commerce adoption in Bangladesh.

A number of researchers have tried to establish a theoretical model based on the Technology Acceptance Model (TAM) as well as the Theory of Diffusion of Innovation (DOI), Theory of Planned Behaviour (TPB), Theory of Reasoned Action (TRA) and Technology–Organization–Environment (TOE) framework in order to explain e-commerce adoption decision in SMEs in emerging economies (Ghobakhloo, Arias-Aranda, & Benitez-Amado, 2011) (Chen, Windasari, & Pai, 2013) (Shi, 2013) (Amin & Hussin, 2014) (Awa, Ojiabo, & Emecheta, 2015).

King & He, (2006) conducted a statistical meta-analysis with user and usage type and their effect on TAM by using 88 published studies to rigorously identify and validate the factors causing people in organization to accept and use the information systems (King & He, 2006). Park, (2009) in his study identified TAM to be a good theoretical tool to gauge users' acceptance of e-learning (Park, 2009). Awa, et al. (2015) proposed a framework that integrated the TAM, TPB and TOE framework to predict the IT adaptation of SMEs in a more organized way (Awa,

Ojiabo, & Emecheta, 2015). Ghobakhloo, et al. (2011) examined how TOE framework is affecting the organization's decision to adopt E-commerce. Shi, (2013) argues that Small enterprises rely on e-commerce to innovate business model. The study systematically reviewed related research about key factors affecting small enterprises E-commerce adoption decision, and established a theoretical model of small enterprises E-commerce adoption decision based on TAM model & TOE framework (Shi, 2013).

As of now, a very few research was undertaken on the factors affecting e-commerce adoption in Bangladesh. Researches so far mainly focused on growth potential, barriers and challenges of e-commerce. Some other studies have been done focusing e-commerce adoption in SMEs. As mentioned earlier, Islam, (2018) observed the growth and challenges of e-commerce in Bangladesh and found a very good growth potential for both B2B and B2C e-commerce in Bangladesh (Islam, 2018). Bhowmik, (2012) assessed the status of e-commerce adoption in Bangladesh and found that Bangladesh Government is also taking some actions to facilitate and encourage e-commerce adoption (Bhowmik, 2012). Azam & Quaddus, (2009) studied the impacts of different organizational characteristics on the e-commerce adoption in the context of SMEs in Bangladesh. Noor & Arif (2011) studied the factors affecting adoption of B2B electronic commerce by the SMEs in Bangladesh and tried to measure their effects in explaining the adoption rate. Very few researches have been conducted using the theoretical model/framework like TAM, DOI, TPB, or TOE framework in the context of Bangladesh. Hoque, et al. (2015) tried to determine the factors that influence the adoption of e-commerce services in Bangladesh using extended version of Technology Acceptance Model (TAM). Azad & Hasan, (2011) used Rogers's theory of diffusion of innovation as the theoretical foundation to study the e-commerce adoption behavior in Bangladeshi SMEs. Azam & Quaddus, (2013) used

Hofestede's framework to assess national culture along with two fundamental antecedents of TAM, perceived usefulness and perceived ease of use, to examine the influence of national culture on the adoption decision and use of ICT by Bangladeshi SMEs.

Therefore, a very clear research gap is found regarding identifying factors that contribute to the adoption of ecommerce using any established technology acceptance model. This study gap, along with the present careworn e-commerce adoption situation of Bangladesh, triggered the need for conducting research to address the knowledge gap in this field of study.

1.3 Problem statement

From the discussion in the previous section, it is obvious that, though Bangladesh has made a lot of progress in e-commerce throughout the years, the untapped potential of the e-commerce industry is yet to be explored and realized fully. At the same time a clear gap in the field of e-commerce adoption study was found. So, the problem statement for this research is as follows.

"Despite a high growth potential, Bangladesh is still lagging behind in e-commerce adoption".

The problem statement very clearly establishes the need for conducting a study to identify and analyze the aspects of e-commerce adoption in Bangladesh. Therefore, the fundamental research question of this thesis is as follows.

RQ: *What factors affect the adoption of e-commerce among the individual consumers?*

To address the above research question, and to properly examine the e-commerce adoption situation of Bangladesh, three specific sub segments are identified. They are: mobile financial services (MFS), internet banking, and online marketplaces. These areas are context specific to

Bangladesh. Therefore, the fundamental research question is sub divided into the following three specific research questions:

- *What aspects affect the adoption of Mobile Financial Services?*
- *What issues influence the acceptance of Internet Banking?*
- *What factors impact the usage of Online Marketplaces?*

The following section justifies the above research questions and the scope of the study in details.

1.4 Scope

As mentioned in the previous section, the thesis focused on three areas i.e., adoption of mobile financial services (MFS), internet banking, and online marketplaces to examine the factors affecting to the adoption of e-commerce platforms. Each one of these factors have their own identities among the individual consumers. But these three areas are interlinked (Figure 1), as consumers are supposed to transact online using either internet banking or mobile financial service platforms while buying products from online marketplaces.

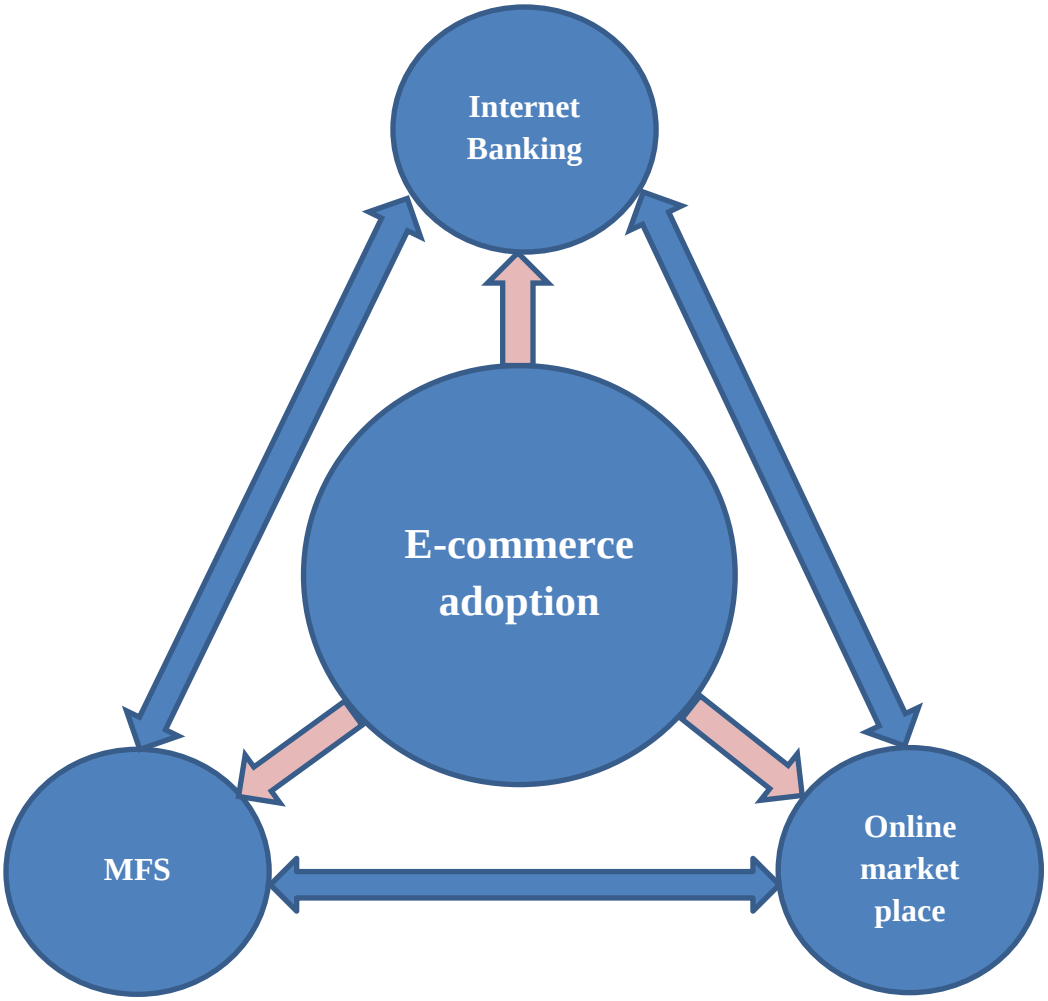


Figure 1: E-Commerce adoption study areas

However, in our country majority of the payments of ecommerce are still made in cash during delivery. These three areas have been growing as standalone factors, they are not interconnected like that of the developed countries. People are using MFS for cash-in, cash-out, merchant payments, utility payments, salary disbursement, foreign remittances, and fund transfers, but not for e-commerce transactions. Same goes for internet banking services. People are doing credit transfers such as payroll, foreign and domestic remittances, company dividends, bill payments, corporate payments, government tax payments, and availing different personal banking services using internet banking platforms but not for e-commerce transactions. Thus, due to the benefits

consumers are getting by using these services, the factors relating to acceptance of these services need to be examined thoroughly to understand their e-commerce adoption behavior.

As of May 2021, there are 15 banks in Bangladesh that provide **mobile financial services (MFS)** and there are 45.762 million MFS accounts (Bangladesh Bank, 2022). MFS are being steadily adapted all over the country. 'Bkash' run by BRAC bank limited holds the lion's share of MFS in Bangladesh having 48% of the market share. They have 5,39,68,418 million verified accounts (Bangladesh Bank, 2022). 'Nagad', the Bangladesh Post Office's MFS, inaugurated in 2019 has 3,41,96,247 account holders having 28% of the market share. Mobile financial services in Bangladesh include cash-in, cash-out, merchant payments, utility payments, salary disbursement, foreign remittances, and fund transfers (International Trade Administration, 2021). The following table (Table 2) shows growth in MFS in the last one year. During this period, average daily transaction has gone up by more than 30% and no. of active accounts have gone up by 15%. The MFS market in Bangladesh is going through a steady rise and people are adapting to them. More and more people are adapting to the idea of MFS.

Table 2: Comparison of MFS data (May, 2021 vs May, 2022)

	May,2022	May,2021	Growth %
No. of Active Accounts in Lac	456	397	14.93%
No. of Total Transaction	379,399,820	346,701,611	9.43%
Total Transaction in crore BDT	92,933	71,247	30.44%
Average Daily Transaction	3,098	2,298	34.79%

(Source: Bangladesh Bank, 2022)

Internet banking first made its breakthrough in Bangladesh in 2010 by the inception of 'SSLCOMMERZ', launched in collaboration with Dutch Bangla bank and BRAC bank (Bappy & Azim, 2018). Now that online banking has opened a huge market internationally, lot of banks

have created online banking services which are in early development stages though. As of June 2022, 5,355,586 people have done a transaction of Tk. 23770.8 crore (Bangladesh Bank, 2022). The inception of Bangladesh Electronic Funds Transfer Network (BEFTN) facilitates both debit and credit cards, as a lead over cheque clearing system. (Bangladesh Bank, 2022). Moreover, the National Payment Switch Bangladesh (NPSB) taken into action from 2012 has been able to establish interoperability among participating banks for their account and card-based transactions. This network can handle credit transfers such as payroll, foreign and domestic remittances, social security payments, company dividends, bill payments, corporate payments, government tax payments, social security payments and person to person payments (Bangladesh Bank, 2022). A lot of banks within the country have adapted these methods and initiated online banking. Even though a lot of strategies have been taken up, the volume of internet banking is still very low. Internet banking is still in the growing stages but holds a huge promise. As shown in Table 3, in FY 21-22, ecommerce transactions by cards increased by 40.50% in numbers and 14.64% in total amount. In the preceding year, the growth rates were higher than this. This shows that in less than two years, ecommerce transactions by cards have more than doubled both in terms of numbers and total value. If people are made more aware of internet banking the usage could increase as well. The amount of internet users in the country keeps on rising with the integration of 4G services, smartphone usage, availability of bill payments and B2C e-commerce platforms.

Table 3: e-Commerce Transactions Statistics by Cards

	Number	Growth Rate	Amount in crore BDT	Growth Rate
FY 21-22	36,335,403	40.50%	10,040	14.64%
FY 20-21	25,860,818	56.04%	8,757	168.89%
FY 19-20	16,573,675		3,257	

(source: Bangladesh bank, e-banking and e-commerce statistics unit)

Online marketplaces are a thriving platform in the current B2C e-commerce scene in Bangladesh. B2C websites are now popular in large urban areas as mentioned before although rural areas are getting some services as of now. Daraz has been the most prevalent B2C e-commerce site in Bangladesh. In 2018, Alibaba group acquired Daraz and declared in 2020 that it would invest $59 million in Bangladesh by 2021 to improve the company's e-commerce logistics infrastructure, including its warehouse and sorting center (International Trade Administration, 2021). Aside from mainstream e-commerce platforms, the more known forms of e-commerce have been small businesses running their own pages and selling their own products. There are over 2000 e-commerce sites and more than 50,000 e-commerce pages on Facebook (International Trade Administration, 2021). The logistics behind online marketplaces is still in development in Bangladesh. The availability of services all over the country is still in development and as a result only 15-20% of deliveries are made outside big cities. Aside from this, almost 80% of bills are paid on delivery for products and services (Khan, 2020). The usage of online methods in cash transfers are still being adapted and this adaptation should be key for businesses helping them to improve their operations within the country. The lack of a robust privacy policy and online frauds that happened in e-commerce makes the current state of it face a lot of backlash. But online marketplaces and start-ups are getting attention. In recent affairs, startups such as Shajgoj, Shopup, Chaldal and a lot of other businesses have gathered a considerable number of investments which indicates the innovation behind e-commerce in Bangladesh.

So, from the above discussion, it is clear that these three sub segments of e-commerce are growing separately due to the benefit customers are getting by using them. But still, these sub segments are interconnected in shaping up the overall e-commerce adoption behavior of the

individual consumers. As mentioned earlier, in Bangladesh, majority consumers still prefer cash on delivery during their e-commerce purchase. Because, people perceive a feeling of risk in using online payment methods during their e-commerce purchases. Also, a trust factor is associated in this regard as consumers are not certain that they will get the product as per their expectation while buying it online. But, gradually the use of MFS and internet banking is increasing for making payments during online purchase. The reason is that, as people are using MFS and internet banking for their inherent benefits and getting habituated with these services over time, people are starting to trust these services and also the convenience of using these services are encouraging them to avail more. This is impacting on the overall e-commerce acceptance behavior of the Bangladeshi consumers.

Therefore, to study the aspects embracing e-commerce adoption, the thesis chooses to examine the acceptance of:

- Mobile Financial Services (MFS)
- Internet Banking
- Online Marketplaces

1.5 Methodology

This research is conducted using a **mixed method** combining both qualitative and quantitative approaches. Morgan (1998) argued that the two methods can be combined without violating any assumptions on the technical aspect. Sieber (1973, cited in Johnson et al., 2007) addressed how the two methods can be combined at different stages of the research process.

In the problem identification and literature review phase, qualitative research is done to identify the research gap through secondary data analysis, depth interview and Focused Group

Discussion (FGD) with the industry experts. Then three conceptual frameworks are developed through extensive literature review and also by consulting the industry experts via depth interviews and FGDs. The conceptual frameworks are similar, but due to the differences in respondents' profile and data collection requirements of the three study areas, three separate frameworks are used in this thesis. The proposed frameworks are discussed in detail in chapter 4, 5 , and 6 respectively.

Quantitative research data are collected through structured survey. To develop the questionnaire for collecting data, relevant literature is reviewed and also industry experts are consulted via depth interview to finalize the questionnaire content. In case of describing the constructs, multiple choice questions and Likert Scale of 1 – 5 are used assuming 1 as 'strongly disagree' and 5 as 'strongly agree' (Likert, 1932). For the study of adoption of MFS, a stratified sampling method is used (Acharya et al., 2013). A total of 317 respondents holding different professions filled out the online survey from all the eight divisions in the country. For the study of adoption of internet banking, purposive sampling method is used to collect responses from each of the eight divisions in Bangladesh, spanning a myriad of professions. A total of 460 respondents are surveyed among which 366 are found to be internet banking users. And for the study of online marketplace, purposive sampling method is used from each of the eight divisions in Bangladesh. A total of 351 respondents holding different professions participated in the survey.

After collecting the data, Structural Equation Modeling (SEM) is used to analyze the data. SEM is a procedure for estimating a series of dependence relationships among a set of concepts or constructs represented by multiple measured variables and incorporated into an integrated model. The proposed frameworks are also tested and validated using SEM. The detail research design and methodology are discussed in the Chapter 3 of this thesis.

After analyzing the data, in all three cases, industry experts are consulted via depth interview and FGD to share and substantiate the findings of the study and to take their views and opinions.

1.6 Contribution

The aim of the research is to find and investigate the prominent aspects of e-commerce adoption in Bangladeshi context. The thesis effectively identifies and examines the adoption factors and proposes some novel contribution in terms of effective adaptation of e-commerce in the context of Bangladesh. In doing so the thesis considers the established technology acceptance models and suggests an extension of Technology Acceptance Model (TAM) with some new constructs which are context specific from Bangladesh perspective. To address the research questions of the thesis, the new constructs considered for extending TAM are:

- Value perception
- Perceived risk
- Customer Service
- Technology Familiarity and
- Trust

By combining the findings of the three study areas: adoption of MFS, internet banking and online marketplace, the thesis identifies the constructs affecting e-commerce adoption in the context of Bangladesh. The constructs are: perceived risk, ease of use, value perception, customer service, technology familiarity and trust. Thus, the thesis effectively answers the research question satisfying the aims of the study.

The contribution of the thesis can be considered from two perspectives: ***academic*** and the other ***industry***. The benefit of considering these two perspectives is that, the views and findings from

the academic field can easily and successfully implemented in the industry. Thus, the thesis contributes a lot in linking the academia with the industry. The academic outcome of the thesis can be effectively linked and correlated with the business objectives of different e-commerce companies, and successfully translated to be used for promoting their business growth.

The following sub sections discusses the academic and industry perspectives of the thesis.

1.6.1 Academic perspective

As mentioned above, the thesis extended existing theoretical model, TAM, in the context of Bangladesh by considering some new constructs. The basic TAM model proposes two main constructs, perceived usefulness and perceived ease of use, which are impacted by different external variables and affect the attitude toward using any particular technology. Here, "perceived usefulness" refers to the enhancement in performance due to using a particular system, and "perceived ease of use" refers to how easy a system is to use. According to the model, "perceived ease of use" also impacts "perceived usefulness", and "perceived usefulness" has a direct impact on behavioral intention as well. This thesis used the above mentioned constructs of TAM and proposed conceptual models through extending the existing model by adding five new constructs such as Value Perception, Perceived Risk, Customer Service, Technology Familiarity, and Trust. to explore the e-commerce adoption tendency of Bangladeshi consumers. The proposed conceptual frameworks are tested and validated and can be used by organizations for their business purposes.

With the aim of identifying the factors contributing to the adoption of ecommerce, this study sheds light into the factors contributing to the adoption of mobile financial services (MFS), internet banking, and online marketplaces separately. The study does not introduce a new theory

to explain the phenomenon, but rather extends existing theory in the context of Bangladesh by introducing new factors and identifying factors in the existing theory which are relevant in this context.

The theory of technology acceptance model (TAM) was proposed by Davis (1989) to explain the factors contributing to the adoption of certain technology by consumers. Globally TAM is considered to be one of the most widely accepted theories used. Many studies have extended the existing theory in the context of different geographies and timelines. In the context of Bangladesh, multiple researchers have also used TAM for different context. However, there was a gap in research regarding identifying factors that contribute to the adoption of ecommerce, not as a whole but by segmenting ecommerce into more specific categories. This study bridges that knowledge gap by breaking down ecommerce into three area – mobile financial services, internet banking, and online marketplaces. This helps to gain more detailed insight into each segment and identify factors exclusive to the adoption of each area.

This study started out with literature review to identify constructs that played a crucial role in the adoption of ecommerce across all three verticals – MFS, internet banking, and online marketplaces. Furthermore, these constructs are validated through a qualitative study and further constructs are introduced in the context of Bangladesh. For example, in the proposed conceptual framework for studying the adoption of MFS, perceived risk and value perception are introduced. Results found that, perceived value, perceived risk, and ease of use has decisive role on determining customer satisfaction of MFS. This observation also holds true for the positive effect of value perception on customer satisfaction and the positive effect of customer satisfaction on positive brand attitude towards MFS.

In the proposed conceptual framework for analyzing the adoption of internet banking, customer service and technology familiarity are added along with perceived risk and value perception. Results found that, adoption is positively impacted by ease of use, customer service, and technology familiarity. The study also found that, customer satisfaction is positively impacted by the perceived value, customer service, technology familiarity and usage adoption; and negatively affected by the perceived risk. And usage continuance is positively impacted by both usage adoption and customer satisfaction.

Trust was added along with perceived risk, value perception and customer service in the proposed conceptual framework for exploring the adoption of online marketplace. Results found that, perceived risk has a negative effect on usage adoption of e-commerce platforms. In this case, the idea of risk is associated with product quality and on time delivery. Also, when customers are choosing a product from a variety of items in the same product category, sometimes they are unable to assess the quality of the product by seeing the catalog picture at the time of ordering and thus perceives a product quality risk. The study also found that, trust and adoption confirmation have direct positive impact towards customer satisfaction.

In this way, this thesis tries to bridge the research gap by extending an existing technology acceptance model to analyze the e-commerce adoption behavior of individual consumers in the context of Bangladesh.

1.6.2 Industry perspective

The thesis does not only limit itself to extending an existing theory, but also has very important contributions from industry perspective. Usually, it is not easy to relate and use any academic research output to any practical business situation. But this thesis outcome can be successfully

translated to be used by organizations for their marketing and branding. The findings from the study can be used by industry practitioners to expedite the adoption, improve the user experience and retain users. For the sustainability of business and factors relating to value proposition development, market segmentation, brand positioning, brand awareness, this study provides guidance.

— Firstly, the study identifies factors that are crucial in the adoption of ecommerce. This means that practitioners can focus on these factors to improve user experience and increase user adoption as well. For example, a negative impact of perceived risk was seen for internet banking. So, mitigating the risks or taking steps to reduce perceived risk can establish trust among the users and increase user adoption. Additionally, branding or advertisement can also factor in the perceived risk of users and show how the company deals with the risk factors. The same will apply to users of other forms of ecommerce as well. Factors identified from the study can be translated into practical implications.

— Secondly, after the users have already adopted ecommerce, sustainability of the business is of utmost importance. This means steps have to be taken to retain the users and continued usage will have to be ensured. In light of the implications from this study, trust and brand integrity can be enhanced by taking appropriate measures. For example, it is found that most e-commerce users still pay by cash on delivery, which shows the lack of trust in the payment system. In light of the findings of the study, practitioners can follow steps to improve customer experience and ensure sustained usage of ecommerce.

The thesis outcomes are shared and discussed with the industry experts and specific recommendations are made to improve their adoption situation. The examples of ‘bKash’ and ‘Foodpanda’ can be discussed in this regard.

REDUCING THE RISK PERCEPTION OF THE MFS USERS

The thesis findings can guide the MFS companies like bKash to effectively communicate its customers on reducing the risk perception. In this case, the thesis recommended that, MFS company like bKash can show the customer that, if any bank account holder leaves a signed cash cheque on his/her table unguarded, then anybody can get hold of it and withdraw money from his/her bank account. Sharing an OTP or pin number of anyone's bKash account is as risky as the signed cash cheque. So, the customer should not share the pin number or OTP with anyone. They should not deviate from the standard security protocol and thus can minimize the risk of any fraudulent activity. By communication in this way, MFS companies can reduce the perceived risk of the customers and thus can increase the adoption of mobile financial services.

IMPROVING CUSTOMER SERVICE TO ATTRACT MORE CUSTOMERS

Another example can be cited with the popular food delivery app 'Foodpanda'. Earlier Foodpanda's customer service are not available during the food delivery process. They don't have any call center or any real time messaging option in their app. So, customers are unable to contact them if required during the food delivery process. Customer are able to contact them through email only. In Bangladesh, still majority customers prefer cash on delivery. And for food, it is even more popular. Consider a situation where the customer paid online via credit card or MFS for the ordered food. After that, while delivering the food, the food delivery person calls the customer in his/her mobile phone number but unable to contact the customer for some time. Then the food delivery person waits 10/15 minutes and cancels the order for not getting the customers. In this case, the customer will not get any refund and also, they are unable to contact Foodpanda real time during the food delivery process to make any query or report anything. But if it were cash on delivery, the food delivery person would have delivered the food at any cost. This research pin pointed Foodpanda the issue that for promoting e-commerce business it is

necessary to encourage customers to pay online for the goods and services they are purchasing. Bute in this case, Foodpanda were not refunding the customers and thus rather encouraging them to go for cash on delivery. And also, customers were unable to contact Foodpanda real time, only the food delivery persons were able to do that via the messaging through the app. From the recommendation of this thesis, Foodpanda introduced real time messaging option for customers in their app and also now they make refund for undelivered food, if necessary, while the customers pay online. This encouraged customers more to adopt online food delivery services.

In this way the thesis findings and recommendations helped the business organizations to take specific actions as solutions to their business problems.

1.7 Thesis outline

This thesis is arranged into seven chapters as follows.

Chapter 2 includes detail background study starting with the comparison of e-commerce situation of Bangladesh with selected other countries. Then it describes some theories and models of technology acceptance such as Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB), Technology Acceptance Model (TAM), Technology Readiness Index (TRI), Theory of Diffusion of Innovation (DOI) and Technology–Organization–Environment (TOE) framework and then summarizes the models. After that it presents the researches on e-commerce adoption in Bangladesh including the studies related to Mobile Financial Services, Internet Banking and Online marketplace.

Chapter 3 describes the research approach and methodology of the thesis. This chapter starts with the research approach, followed by the conceptual framework to be used in this thesis, sampling and data collection plan, data analysis plan and ethical considerations.

Chapter 4 discusses the adoption of MFS. It starts with the proposed conceptual framework and hypothesis development. Then it deliberates the findings starting with evaluating the proposed measurement model, followed by hypothesis testing, analysis and discussion on findings.

Chapter 5 delineates the adoption of internet banking. Similarly, this chapter starts with the proposed conceptual framework and hypothesis development. Then it discusses the findings starting with evaluating the proposed measurement model, followed by hypothesis testing, analysis and discussion on findings.

Chapter 6 describes the adoption of online marketplace. This chapter also starts with the proposed conceptual framework and hypothesis development. And then it discusses the findings starting with evaluating the proposed measurement model, followed by hypothesis testing, analysis and discussion on findings.

Finally, Chapter 7 concludes the thesis along with the discussion on findings, limitations, and directions for future research.

2 Chapter 2: Background Study

E-Commerce, like most novel global services, arrived later in Bangladesh than in the rest of the world. The first e-Commerce operation was started in the late 90s mainly for sending and receiving gifts from abroad. The first real e-Commerce was initiated by cellbazaar.com in 2006 (Mohiuddin, 2014). Since then, the e-Commerce scenario has experienced a major boom. The progress has been accelerated by recent policies set by the government. In 2009, the Bangladesh Bank passed the bill to legalize online transactions, and in 2013, the government allowed the usage of international credit cards for purchases.

With the mission of creating a digitalized country and the vision of a making a Digital Bangladesh, the Bangladesh government has set out on their quest to become a digital nation. Although the country has made a lot of progress throughout the years, the untapped potential of the E-commerce industry is yet to be explored and realized fully by the country. Bangladesh has entered into the era of population dividend and this upcoming young group of people can't be underestimated as we have seen through many active movements in recent years.

2.1 Definition of E-commerce

Despite being a relatively new concept being added to the business vocabulary during the 1970s (Wigand, 1997), most literature define e-commerce in a generic way. Hossain et al. (2018) define e-commerce as all sorts of business based on internet. Using communications and information technology, e-commerce leverages on a platform to share information among all stakeholders. They further characterize e-commerce as "technology driven, business model innovation, and quick scale expansion". E-commerce is bringing about major shifts in business paradigms, resulting in immense growth throughout the world. It affects both marketers and customers

through transmission of analytics and transactions. (Shelke, Mirajkar and Dedgaonkar, 2022) With e-commerce, companies can utilize new channels to exchange information with different stakeholders due to the development of new technology and social commerce (Halji and Shanmugam, 2014). However, different organizations may approach e-commerce from different perspective. For example, focus is given on consumers from a marketing perspective. All different utilities can be served by having one static presence on the web. (Batra and Arora, 2020) From this perspective, the only requirement of a company being an e-commerce can be the static presence on the internet. But this definition can be a subject of argument. This study adopted the simplest definition of e-commerce - "the use of internet to process and conduct the business" (Duong, 2019; Delone and Mclean, 2004) and focus on e-commerce from the perspective of a consumer.

E-commerce adds values to companies in different facets. On one hand, it enhances the customer experience by providing superior services, a diverse range of available products, and no limitations on timing of purchase. On the other hand, it reduces the costs of a company be reducing barriers to entry to different markets and different segments of the population, lower distribution costs, and increased efficiency in marketing and distribution costs. Furthermore, e-commerce increases the efficiency of communication within and outside the company with different stakeholders as well. E-commerce has brought about major changes to business practices, benefiting all stakeholders. (Duong, 2019; Nanekharan, 2013; Adelaar et al., 2004; Santarelli and D'Altri, 2003; Kaynak et al., 2005).

2.2 Comparison of e-commerce situation of Bangladesh with other countries

To compare the e-commerce adoption scenario, some countries are selected. The criterion for selecting those countries was the time period when they first started using internet service. A five year time period from 1993 to 1998 was chosen in this regard. Based on that Egypt, South Africa, Singapore, Pakistan, Malaysia, Sri Lanka, India, Thailand, Vietnam, Nigeria, and Indonesia are chosen. Then data are collected from different sources to make a comparison with the current e-commerce scenario of Bangladesh.

The emergence of e-commerce is closely intertwined with the advent of internet. Electronic Data Interchanges and teleshopping in the developed countries started during 1970s that paved the way for modern day e-commerce. However, online shopping only became possible when the internet was opened to the public in 1991 (Bryant, 2011).

2.2.1 E-commerce commencement in different countries

E-commerce commenced its journey after 1995 in the developing countries like Vietnam, South Africa, India, Pakistan, Bangladesh, Sri Lanka, Egypt, Nigeria, Indonesia, and Malaysia when the rate of internet penetration was rising significantly. These countries began to get internet services throughout 1993-98. Egypt (Kamal, 2016) and South Africa (The Internet and South Africa, 2017) became the first two nations among them to receive internet services in 1993 while Nigeria (Adomi, 2005) and Indonesia (Alo, 2018) were the latest to receive the service in 1998. The middle Eastern country Egypt is also the first among the ten countries to initiate its e-commerce journey. Realizing the importance of information and technology at an earlier time, the government and private sector emphasized in promoting e-commerce. In this regard, the

Internet Society of Egypt established its e-commerce committee to promote education and awareness of E-commerce in 1997 (Kamel, 2014).

Table 4: Years indicating internet service first provided and initiation of e-commerce in 12 countries

Name of the Country	Internet Services First Provided	Initiation of E-commerce
Egypt	1993	1997
South Africa	1993	1998
Singapore	1994	1996
Pakistan	1994	2001
Malaysia	1995	1998
Sri Lanka	1995	2002
India	1995	2004
Thailand	1996	2004
Bangladesh	1996	2006
Vietnam	1997	2001
Nigeria	1998	2010
Indonesia	1998	2011

[Source: compiled from (Dawood, 2019), (Salman et al., 2013), (Wong, 2013), (Rajapakse, 2004), (Lane, 2004), (Assisi, 2020), (Binu, 2019), (Islam, 2016), (Protik, 2019), (Pham, 2017), (Orimobi, 2018) and (Moore, 2017)]

Malaysia and South Africa hold the second position in terms of beginning their journey of e-commerce. E-commerce started in both countries during 1998. Kalahari.net by Naspers limited started its e-commerce operations in South Africa. Although the journey commenced earlier than the other countries, the country had to struggle a lot to develop the e-commerce sector in the last twenty years. On the other hand, starting at the same time with South Africa, e-commerce in Malaysia flourished remarkably within a very short period of time by boosting the availability of internet services and usage of computers in households and offices. Lelong.com.my was the first e-commerce platform in Malaysia followed by eBay. Multimedia Super Corridor (MSC), created by the government assisted greatly to facilitate the e-commerce by ensuring low telecommunication tariffs, no censorship on the Internet, and a well-developed IT infrastructure of fiber optic cabling.

Internet services became available in India, Pakistan, Sri Lanka, and Bangladesh almost at the same period. However, Pakistan went ahead in initiating e-commerce in 2001 along with Vietnam. Pakistan managed to develop a strong IT sector and e-commerce industry by investing heavily in ICT infrastructure during the past two decades. Beliscity was the first online store that launched in 2001 and some of the early websites are Shophive, Symbios, and HomeShopping. Internet came to Vietnam in 1997, three years after Pakistan. Since the inception of e-commerce in 2001, the government of Vietnam supported the industry with much attention.

E-commerce operation of Sri Lanka began in 2002, but it could not make much progress until recently and still has a long way to go. India received internet services in the same year as Sri Lanka in 1995. E-commerce was launched in 2004 when Information Technology Act of 2000 was put into action, amendments were made to the Indian Penal Code and some other acts in order to make them more compliant with technological developments. Eventually, the new start-ups- Flipkart, Infibeam, Myntra and Snapdeal started their operations from 2007.

Bangladesh first got internet access in June, 1996. Internet penetration was quite low in the early years and there were only 186,000 subscribers in 2000. Cell-bazaar.com was the first e-commerce website inaugurated in 2006 which marked the beginning of e-commerce journey in Bangladesh. The growth of e-commerce sector was stimulated after Bangladesh Bank had granted permission to legalize online transactions in 2009 and the government had allowed the usage of international credit cards for purchases in 2013. Akhoni, Ajkerdeal, and Rokomari.com entered the market in 2013. Kaymu and Daraz emerged in 2015, but Kaymu had to merge with Daraz later on as it lost a huge amount of money in marketing for quick sales.

Nigeria and Indonesia began their expedition of e-commerce in 2010 and 2011 respectively. A branch of Kalahari.com, a successful South African online store, had been set up in 2010.

Nigeria experienced significant advancements in its e-commerce sectors due to the contribution of foreign venture capitals and investment companies. The leading players of the market during 2013 were Vconnect Nigeria and Mocality.com.ng. Devastated by the Asian Financial Crisis of 1997, Indonesia stepped into the world of e-commerce after the nine other countries. Nevertheless, the country became one of the fastest growing economies in the world by overcoming the economic turmoil and financial contagion. Tokopedia, Shopee, and Blibli.com are some of the e-commerce companies that played a role in booming the e-commerce sector of Indonesia through attracting investment and attention from financiers overseas.

Bangladesh was not a tech-savvy nation to begin with. It had a vast population comprising of a huge number of illiterate people. As a result, the country had to go through a massive reformation. The income of citizens, education, uninterrupted electricity and connectivity were of prime concern in the early days. With the vision of creating Digital Bangladesh, planning effective strategies, conducting environment analysis, setting achievable targets, and implementing of the planned strategies had crucial contributions to embark on the mission to adopt e-commerce in this country.

Very low internet penetration, slow internet speed, inadequate logistics infrastructure, low consumer acceptance of e-commerce, lack of a tangible revenue model, and skepticism regarding online usage of credit cards were the principal challenges faced by India in the primary stage. The situation was intensified further due to the dot com bubble burst in the early 2000s (Shahane, 2020). Around 1000 IT companies in India had to cease their operations at that time. It was indeed very difficult for India to overcome all the hardships in order to establish a sustainable e-commerce market.

After emerging in 2001, the e-commerce industry of Pakistan got into trouble because of the sudden ban on PayPal services (Ians, 2019). There weren't any alternative online payment services at that time. The problem was solved with the introduction of mobile payment systems in Pakistan. Likewise, Sri Lanka, South Africa, Indonesia, Vietnam, and Malaysia had to tackle the hindrances that came in the way of developing e-commerce.

2.2.2 Revenue and growth of e-commerce in different countries

In 2019, the global online retail market was valued at US $ 3.5 trillion, and this is expected to reach US $ 5 trillion in 2021 (Statista, 2020). Growth will be led by Asia, with the region already accounting for more than half of global sector revenues. The following figure shows the revenue earned by the countries in the year 2019.

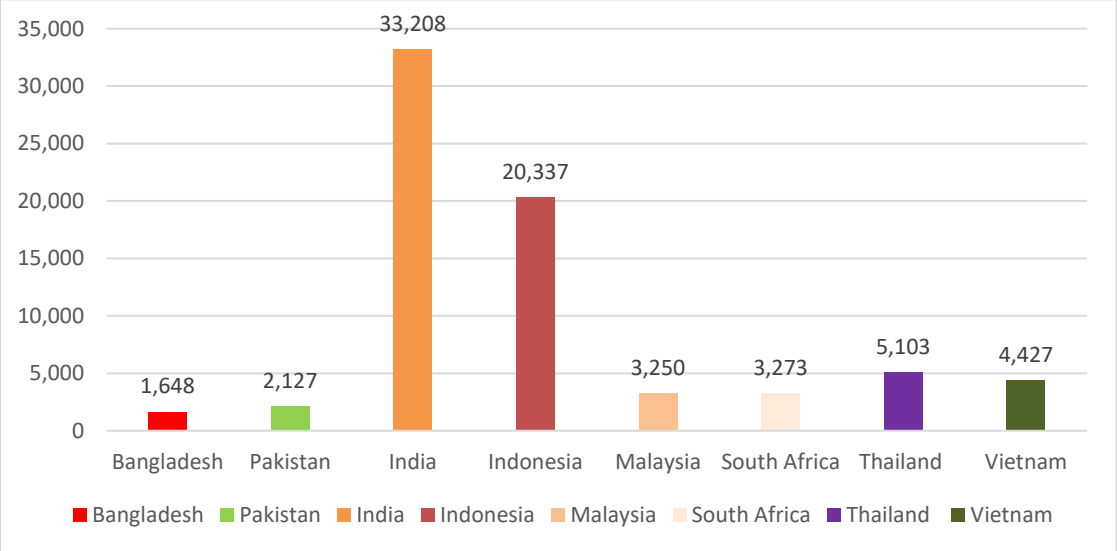


Figure 2: E-commerce revenue earned by different countries in 2019 | Source: E-commerce Market, Statista

In terms of Compounded Annual Growth Rate (CAGR), Bangladesh has a high growth rate of 16.6% that shows a growth potential waiting to be unearthed. Egypt is the third highest populated country in Africa and has the highest number of internet users in the Arab world.

Egypt has an annual growth rate of 27.3% which is the highest compared to other countries. Among the SAARC countries, India has an annual growth rate of 13.1%, Sri Lanka 21.3%, and Pakistan 16.3%.

The following figure shows the CAGR (2020-2024).

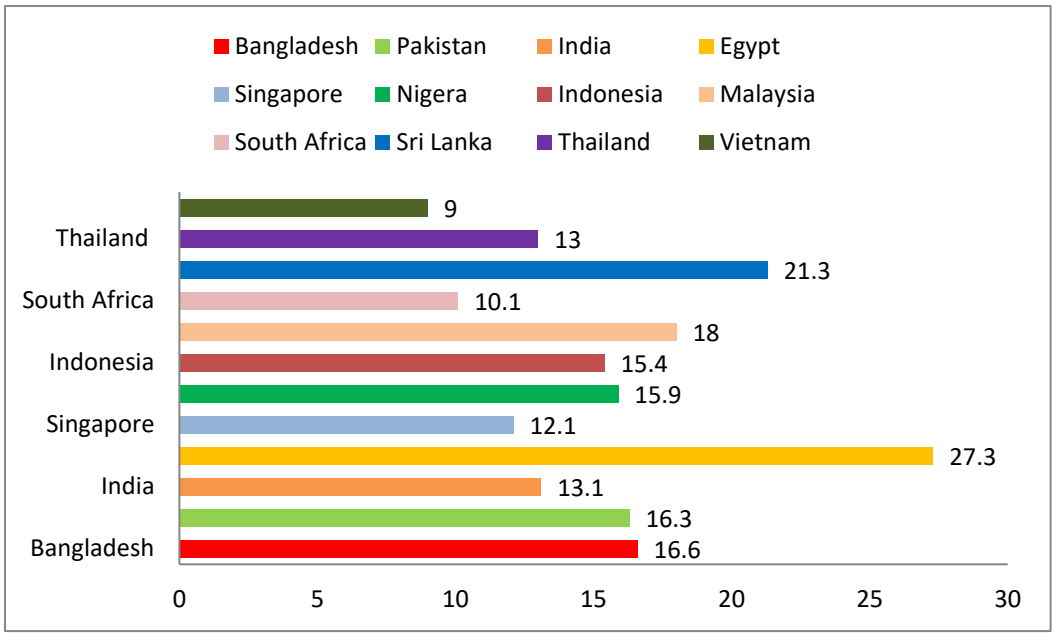


Figure 3: Expected CAGR (%) of e-commerce market size (2020-2024) of different countries | Source: E-commerce Market, Statista

2.2.3 UNCTAD B2C E-commerce Index

The UNCTAD B2C E-commerce Index shows a country's readiness to support online shopping. The index considers four interrelated indicators to measure the readiness towards online shopping of a country. The indicators are detailed in Appendix B of the thesis. This study focused on three of the indicators of UNCTAD B2C E-commerce Index: Account ownership at a financial institution or with a mobile-money-service provider, Individuals using the Internet (% of population), and Secure Internet servers (per 1 million people).

Figure 4 compares the ranking of the countries, which shows that Bangladesh's preparedness to support online shopping is very low compared to other countries and only better than Pakistan. Singapore, being a developed economy with access to latest infrastructure and technology is sitting at the top. It is noteworthy that, Nigeria, Sri Lanka, Thailand, Vietnam ranks higher than Bangladesh and this show that Bangladesh has a long way to go to prepare itself to reap the full benefits of the e-commerce industry.

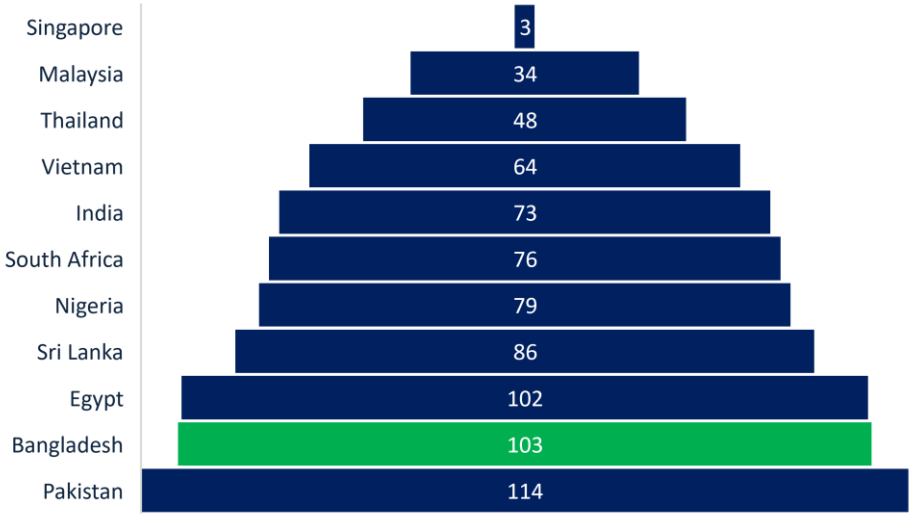


Figure 4: UNCTAD B2C e-commerce Index 2019 (UNCTAD, 2019)

2.2.3.1 Account ownership

One of the crucial factors of e-commerce is payment. Currently, 95% of all e-commerce transactions in Bangladesh occur through cash-on-delivery method (UNCTAD, 2019). This poses a risk as well as inconvenience specially for the e-commerce platform. Although MFS like Bkash, Nagad, DBBL Nexus has recently become popular form of e-payment, Bangladesh still lags behind in this crucial factor compared to other countries. As figure 9 shows, 50% of individuals in Bangladesh has an account at a financial institution or mobile-money service

provider and this number is better than countries like Pakistan, Egypt, Nigeria, Vietnam, but lags behind India, Malaysia, Thailand. This shows financial inclusion is better in Bangladesh compared to some countries, but Bangladesh still needs significant improvement.

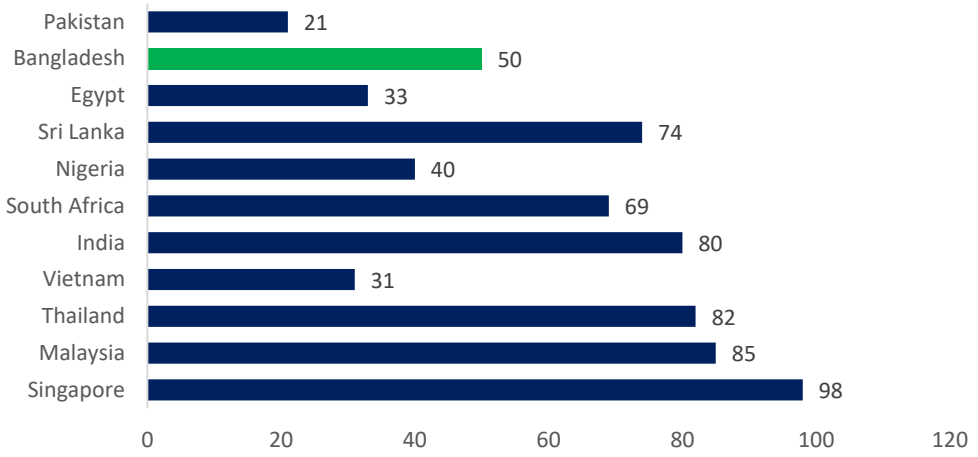


Figure 5: Share of individuals (% of population) with an account at a financial institution or mobile-money service provider (UNCTAD, 2019)

2.2.3.2 Internet Usage

Without internet, there is no e-commerce. So, increasing internet usage is absolutely crucial for a growing e-commerce industry. As of February 2020, the number of mobile connections per capita in Bangladesh was equivalent to 99 percent of the total population; the country ranks 8th in the world in terms of the highest number of mobile connections. But experts doubt, this is due to the usage of multiple mobile numbers by a single individual. However, less than 20 percent had a smartphone. These numbers are 65 percent and 45 percent, respectively, when the whole world is considered (Kemp, 2020).

Internet penetration in Bangladesh stood at 41% in January 2020. This percentage is 64%, 54%, and 96% in China, India, and the US, respectively (kemp, 2020). Although Internet subscriptions in Bangladesh is about 100 million and computer ownership per family was less than 6 percent in 2019 (International Telecommunications Union, 2020). As the figure shows, the percentage of active individuals using the internet is the lowest in Bangladesh among all countries (UNCTAD, 2019). Although, there is high penetration of internet in the urban and semi-urban areas, negligible portion of individuals are active users of the internet in rural areas of Bangladesh.

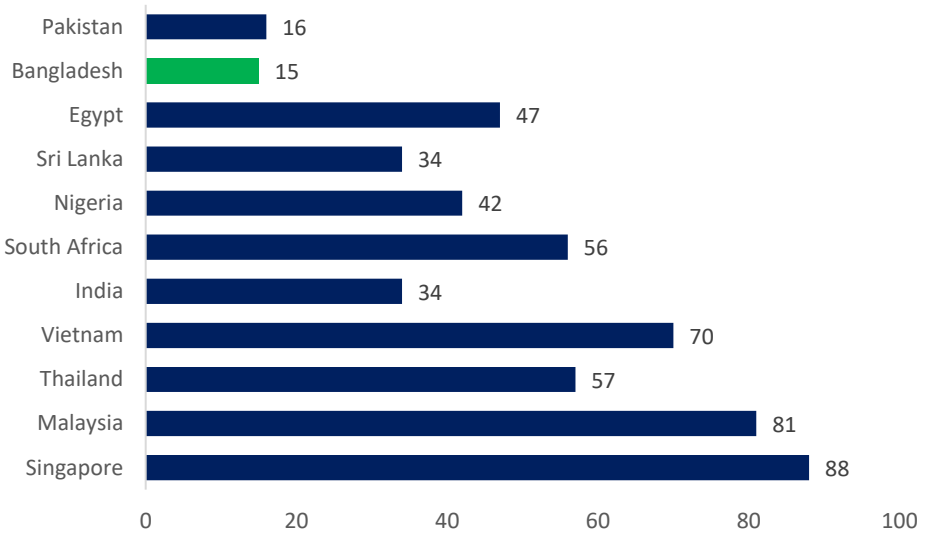


Figure 6: % of Active individuals using the internet in 2019 in different countries (UNCTAD, 2019)

2.2.3.3 Secure Internet Servers

Internet safety and security is another important parameter considered by the UNCTAD B2C e-commerce index. For sustainable growth of the e-commerce ecosystem, it is essential to gain consumer trust and provide them with reliable and safe internet so that users feel comfortable making transactions online and are not vulnerable to online hacking and threats. The following figure shows Bangladesh scores better than Egypt only in terms of providing secure internet

servers whereas Singapore is providing almost 100% secure internet servers (UNCTAD, 2019). Measures need to be taken in this parameter by the government because as the e-commerce grows, it lures attention of hackers which make the consumers safety vulnerable and poses a risk on the overall image and trust on the industry.

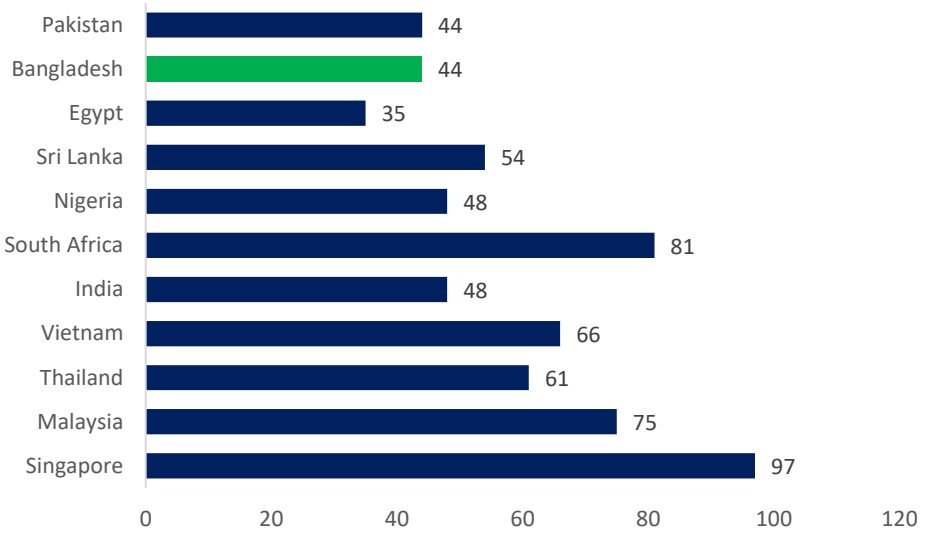


Figure 7: % of individuals with secure internet servers in 2019 in different countries (UNCTAD, 2019)

2.2.4 ICT Development Index (IDI)

The IDI is a compound index consisting of eleven indicators. A combined score is calculated based on these indicators and used to rank developments in ICTs between different countries every year. These 11 indicators are detailed in Appendix B of the thesis.

As the figure below shows, Bangladesh is only one rank ahead of Pakistan in the IDI ranking and 13 places behind India. Singapore, Malaysia, Thailand is among the top 3 of the compared countries which was reflected in earlier indexes too (ITU, 2018).

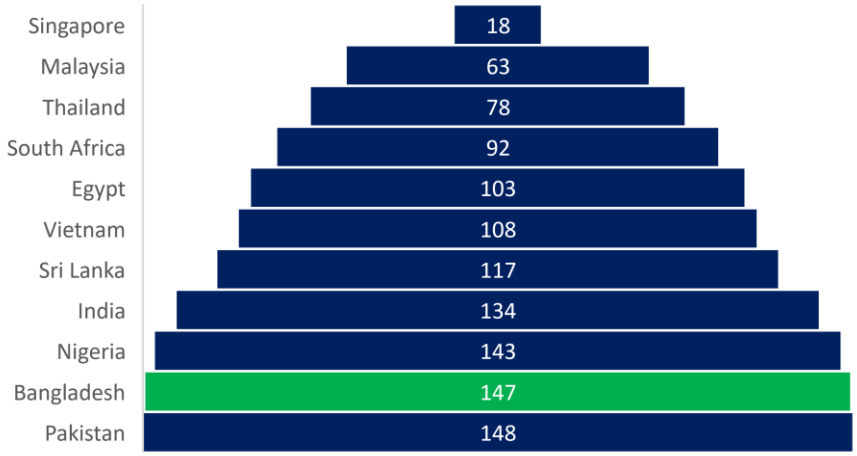


Figure 8: IDI Ranking of Countries in 2017 (ITU, 2018)

In this report, we have focused on two major components of IDI:

1. ICT Access
2. ICT Use

2.2.4.1 ICT Access

This parameter measures the ICT preparedness in terms of five structural and admittance indicators (details in Appendix B2). As the following figure shows, Bangladesh has the lowest value in this parameter, even worse than Pakistan and Nigeria, while Singapore, Malaysia, South Africa scores the top 3 values (ITU, 2018). This shows that Bangladesh needs significant improvement in areas such as internet bandwidth, internet subscription and internet access and this issue was found repeatedly in previous indices.

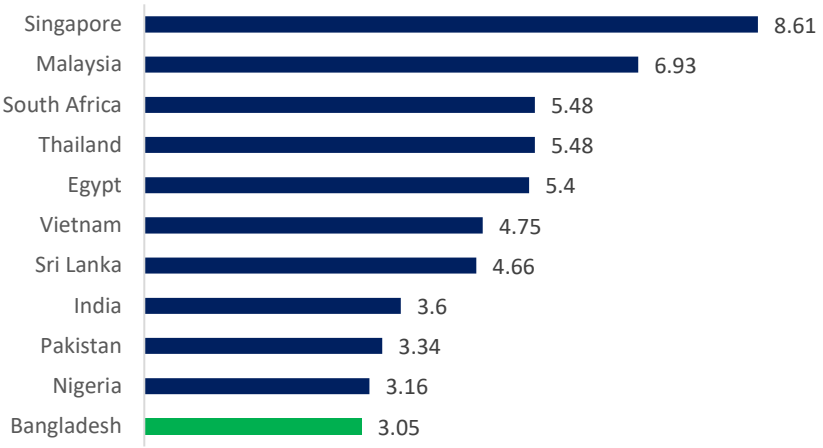


Figure 9: IDI Access Value of Countries (ITU, 2018)

2.2.4.2 ICT Use

This indicator calculates ICT strength using three indicators (details in Appendix B2). As the following figure shows, Bangladesh scores second lowest in the IDI use value, and scored only higher than Pakistan (ITU, 2018). This is again due to the small proportion of individuals using the internet with low broadband subscription and cellular data subscription mainly in rural areas.

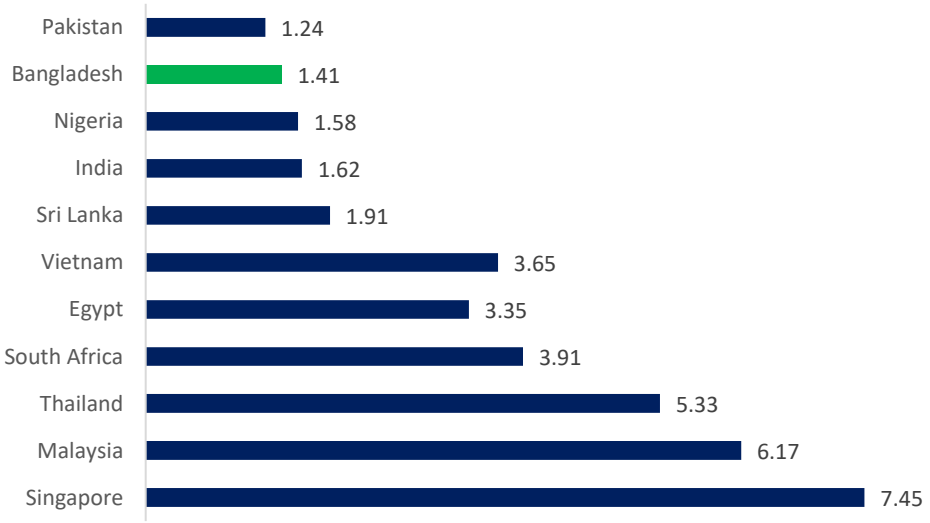
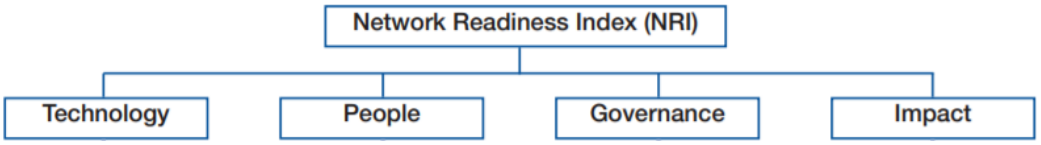


Figure 10: IDI Use Value of Countries (ITU, 2018)

2.2.5 Network Readiness Index (NRI)

Network Readiness Index (NRI) is a framework, which assesses the factors, policies, and institutions that enable a country to fully leverage information and communication technologies (ICTs) for inclusive, sustainable growth, competitiveness, and well-being. The framework of NRI:



2019 NRI Ranking positioned Bangladesh in 101st among 121 countries, just above Pakistan and Nigeria. This ranking surprisingly puts Nigeria in the lease of the compared countries whereas Nigeria was better positioned in the previous two indices. Not surprisingly, Singapore, Malaysia, and Thailand hold the first 3 positions among the compared countries (Portulan's Institute, 2019).

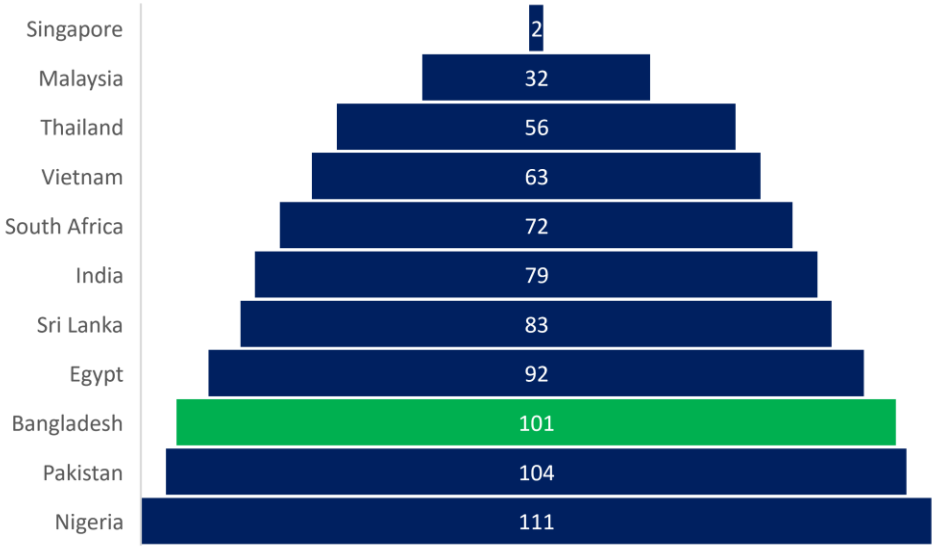


Figure 11: NRI Ranking of Countries (Portulan's Institute, 2019)

In this report, we have focused on these three aspects of the NRI:

1. Technology
2. People
3. Governance

2.2.5.1 NRI Technology

This indicator measures the technology level of a country in terms of communication infrastructure and affordability of the people. The following figure shows Bangladesh to be the second-least technologically-enabled economy among the compared countries. Whereas the average score in this aspect for lower income countries was 30, Bangladesh scored only 27.67 (Portulan's Institute, 2020).

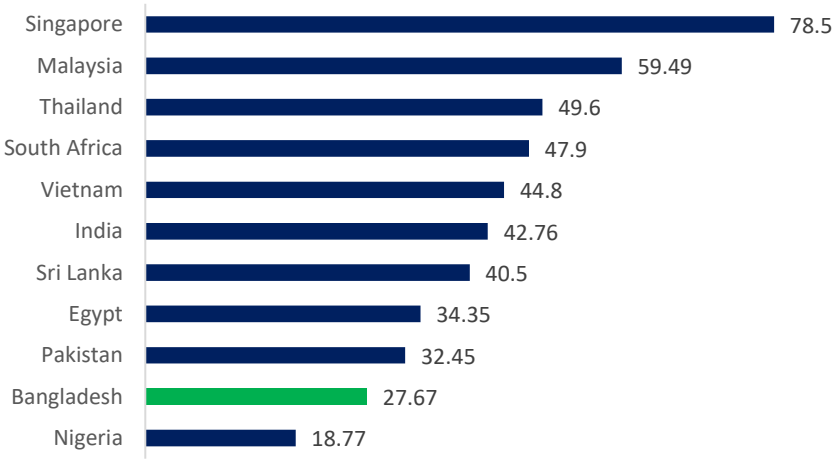


Figure 12: NRI Technology Score of Countries (Portulan's Institute, 2019)

2.2.5.1.1 Household with Internet Access

In this parameter, Bangladesh was ranked the lowest by NRI, lower than Pakistan and Nigeria even. This issue has come up repeatedly in previous parameters too. So, it is a matter of urgency that access to internet is substantially increased in Bangladesh.

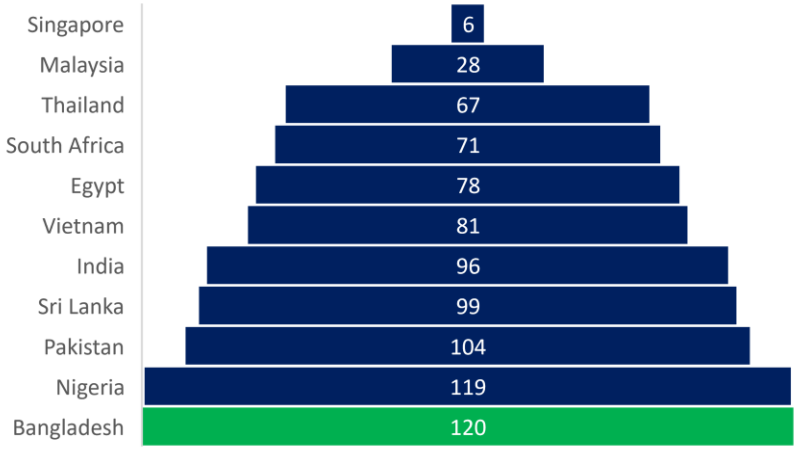


Figure 13: Ranking of countries based on household with internet access (Portulan's Institute, 2019)

2.2.5.1.2 4G Mobile Network Coverage

Mobile network coverage is another important factor for e-commerce adoption. Ranked 96th, despite recent expansion of 4G network coverage, Bangladesh lags behind Pakistan, Egypt and other compared countries except Nigeria.

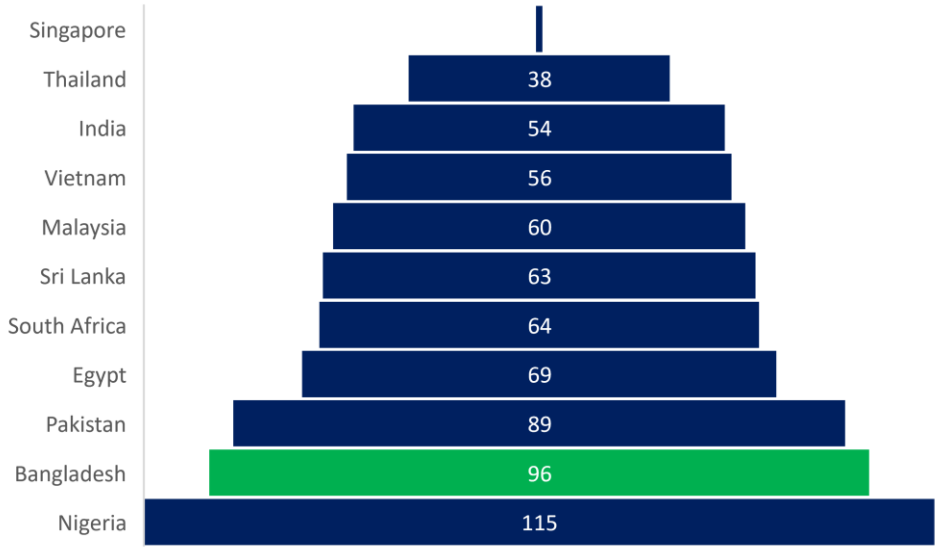


Figure 14: Ranking of countries based mobile network coverage (Portulan's Institute, 2019)

2.2.5.1.3 *FIXED BROADBAND SUBSCRIPTION*

This parameter places Bangladesh ahead of Egypt, Pakistan, and Nigeria. Although Bangladesh was ranked lowest in terms of households with internet access, Bangladesh has done better in terms of households with fixed broadband subscription.

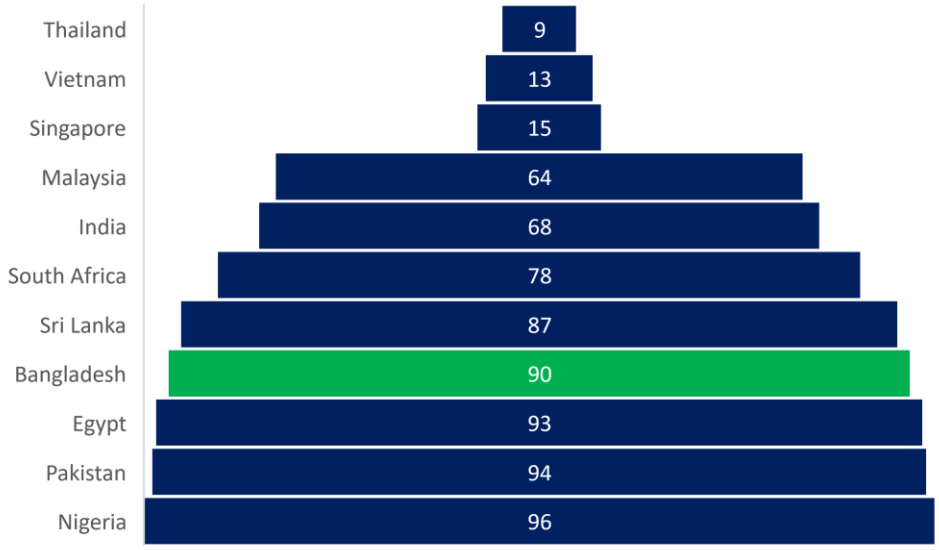


Figure 15: Ranking of countries based on fixed broadband subscription (Portulan's Institute, 2019)

2.2.5.2 NRI People

This indicator measures how different ICT applications are used by people both at individual level and business level. In Bangladesh, only 8% of internet users shop in the internet compared to Singapore where 72% of internet users shop online and Vietnam where 31% of internet users shop online (Portulan's Institute, 2019).

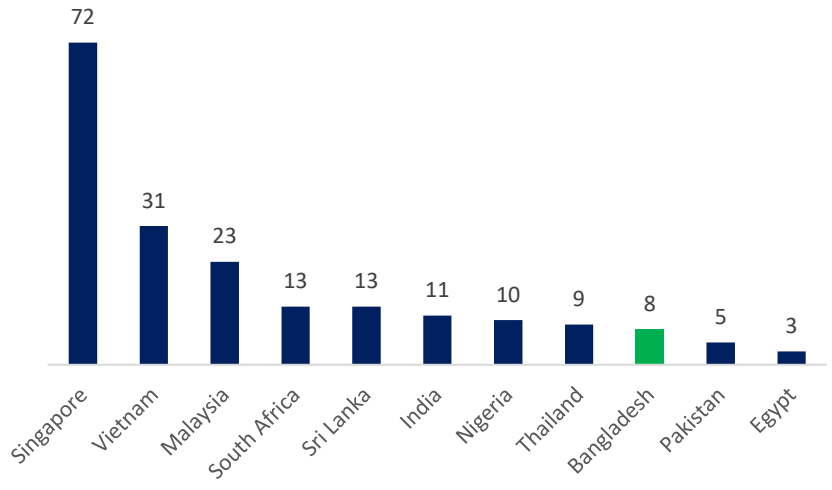


Figure 16: Internet shopper as % of internet users in different countries (Portulan's Institute, 2019)

Only 1% of total population shop in the internet compared to Singapore where 63% of internet total population shop online (Portulan's Institute, 2019).

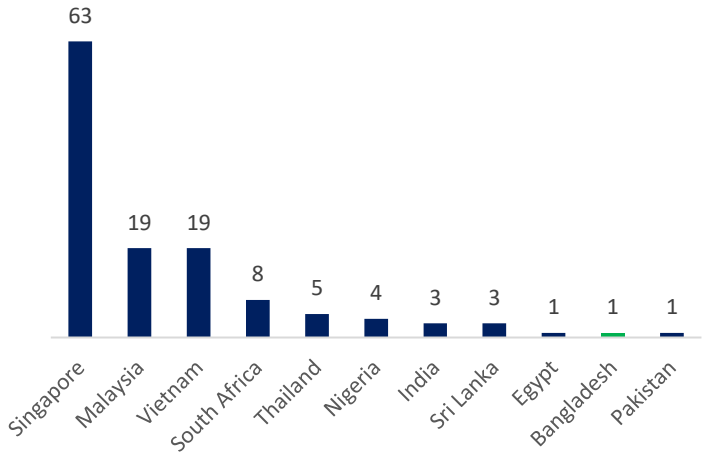


Figure 17: Internet shopper as % of total population in different countries (Portulan's Institute, 2019)

2.2.5.3 NRI Governance

This parameter measures how favorable is the national setting of a country is for its involvement in the network economy, based on issues of trust, regulation, and inclusion. As the figure below shows, Bangladesh still has a long way to go in terms of protecting consumers' trust and safety. Vietnam has made the e-commerce marketplace a safe haven for consumers with the government's special focus on the industry and laws regarding the safety of consumers.

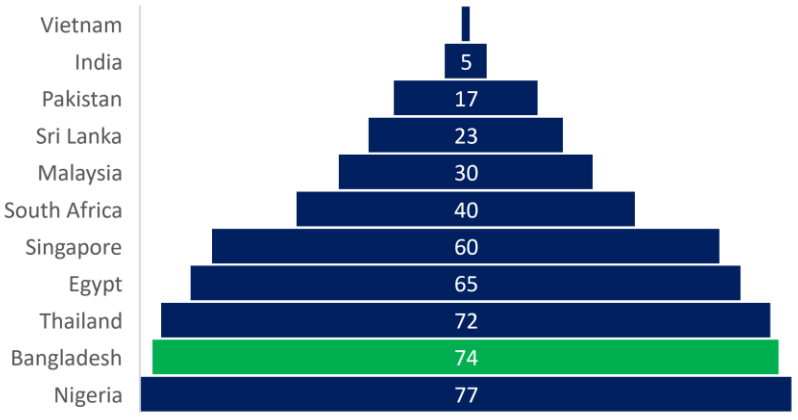


Figure 18: Ranking of countries based on score of online trust and safety (Portulan's Institute, 2019)

Moreover, Bangladesh is least placed in the ease of doing business index (World Bank, 2020) among the countries, which deters foreign investment in the e-commerce industry as well as hinders domestic players' participation (Portulan's Institute, 2019) .

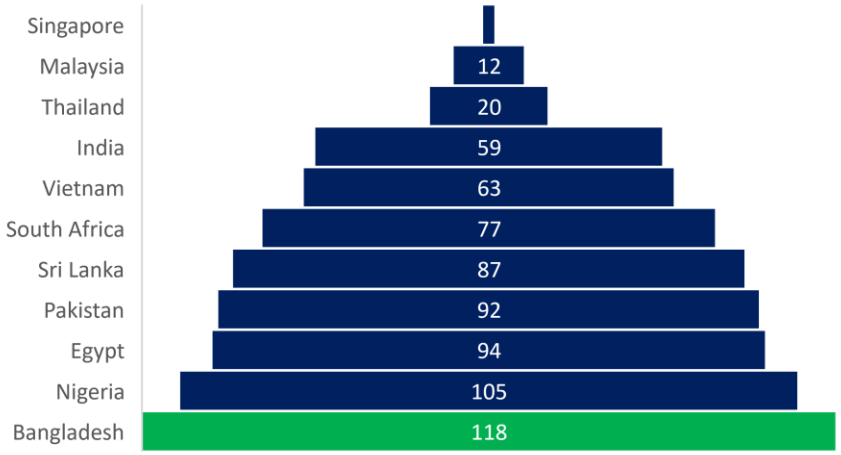


Figure 19: Ranking of countries based on ease of doing business (World Bank, 2020)

So, it is evident from the above discussion that, despite the enormous growth potential, Bangladesh is still lagging behind in terms of e-commerce adoption. That is why this thesis tries to explore the factors that affect the adoption of e-commerce among the individual consumers. For this, the thesis considers some established models and theories of technology acceptance to study the e-commerce adoption behavior of consumers in the context of Bangladesh in the next section.

2.3 Theories and Models of Technology Acceptance

This section discusses six theories and models about the acceptance of technology. These theories are: Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), Theory of Diffusion of Innovation (DOI), Technology-Organization Environment (TOE) framework and Technology Readiness Index (TRI). These

theories have developed over time stemming from each other and several other theories by sociologists and anthropologists.

2.3.1 Theory of Reasoned Action (TRA)

Theory of reasoned action (TRA) was first introduced by Ajzen and Fishbein in 1967 and has since been modified by both the original researchers and other researchers. The Theory of Reasoned Action (TRA) is acknowledged as the earliest model used to explain the acceptance of technology. The theory integrates multiple previous theories and lines of research of attitude, including but not limited to learning theories, theory of cognitive dissonance and expectancy-value theories, and tries to explain human behavior. The assumption behind this theory is that everyone is rational, makes proper use of all available information to drive their actions, and thinks about the consequences of any action before engaging in it (Ajzen and Fishbein, 1980).

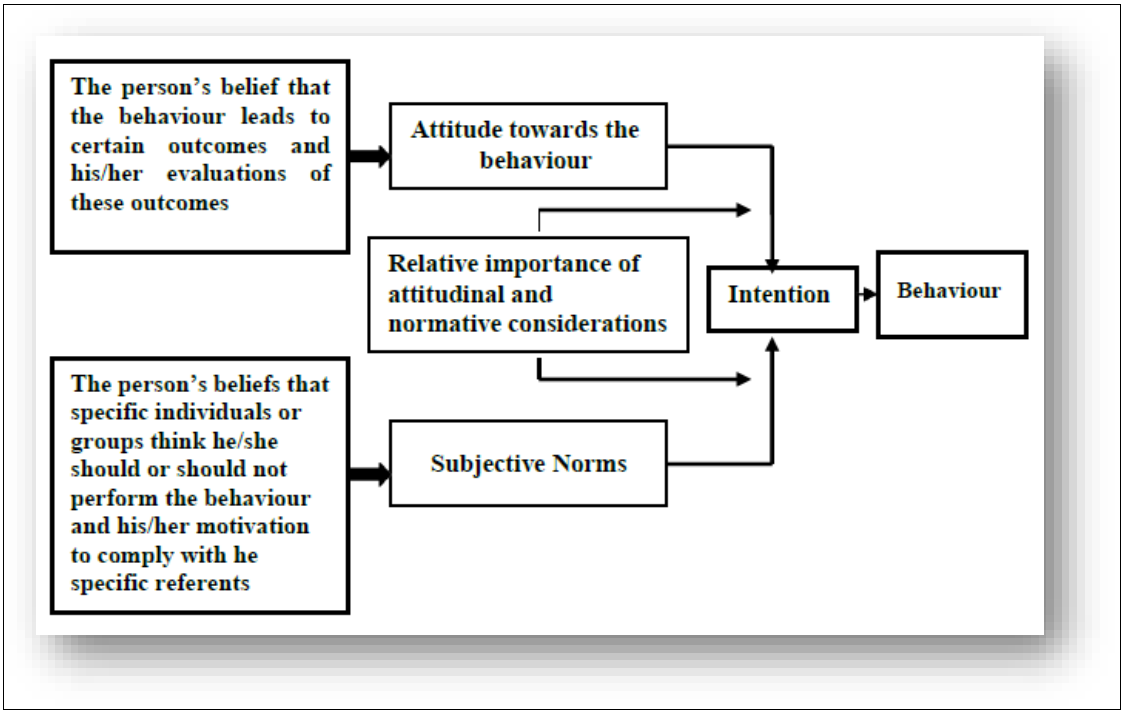


Figure 20: Theory of Reasoned Action (Ajzen and Fishbein, 1980)

TRA addresses “behavioral intentions” as the key determinant of human behavior, as opposed to attitude. Behavioral intentions are products of “attitude towards performance of the behavior” and “subjective norms”. Attitude towards the behaviour can be defined as the degree to which performance of the behaviour is perceived to be positive or negative. Since attitude is an output of a set of beliefs of an individual, Ajzen and Fishbein (1980) have illustrated that the attitude can be predicted with high accuracy if knowledge on that individual’s beliefs is available. To be precise, attitude can be envisaged as the product of a sum of the set of beliefs and their respective evaluation aspects.

On the other hand, subjective norms stem from the social environment. This refers to an individual’s perception about whether or not his/her reference groups, or people who are most important to him/her, think that he/she should perform the behaviour in concern. These can be predicted if knowledge is available about the perceived expectations from individual(s)/group(s) and the motivation to comply with such expectations (Ajzen and Fishbein, 1980).

However, it must be noted that ‘correspondence’ limits the theory, as per Ajzen (1985). TRA can only successfully predict any particular behaviour of attitude and intention agree on variables such as action, target and setting. The greatest constraint of this theory is posed by irrational or hedonistic actions and behaviour, as it violates the assumption that behaviour is under conscious control.

2.3.2 Theory of Planned Behavior (TPB)

Theory of planned behavior (TPB) is an extension of TRA proposed by Ajzen, one of the original researchers of TRA. In 1985, Ajzen proposed the theory to overcome the fundamental limitation of the assumption of “volitional control” of TRA and “addresses issues of behaviors

without a person's volitional control" (Al-Qeisi, 2009). Ajzen introduced "perceived behavioral control" as one of the factors determining "behavioral intentions" and behavior in turn to TRA. This "perceived behavioral control" differs from situation to situation. Perceived behavioral control is hypothesized to impact both intention and actual behaviour, with the effect on behaviour being either direct or interactive.

Ajzen proposes that in circumstances where only a marginal variance in behaviour can be attributed to behavioral intentions, behaviour can be predicted by PBC autonomously. Therefore, both intentions and PBC are key indicators of behaviour, to varying levels of importance according to the contextual setting.

According to Ajzen (1991), three conditions have to be met to accurately predict human behavior under TPB:

1. Correspondence of the factors of "behavioral intention" and "perceived behavioral control" under the same context
2. Consistency of "behavioral intention" and "perceived behavioral control" during the period of assessment
3. Accuracy of "perceived behavioral control" should improve over time to reflect actual control

The three antecedents in the TPB model are behavioral beliefs, normative beliefs, and control beliefs. Behavioral belief is the subjective probability that a specific outcome will be yielded by performing a behaviour. Normative beliefs can be defined as the perception of an individual about particular behavior, which is influenced by the expectations and judgment of reference

groups. Lastly, control beliefs are the school of beliefs that revolves around the perceived existence of variables that either ease or hinder the performance of behaviour.

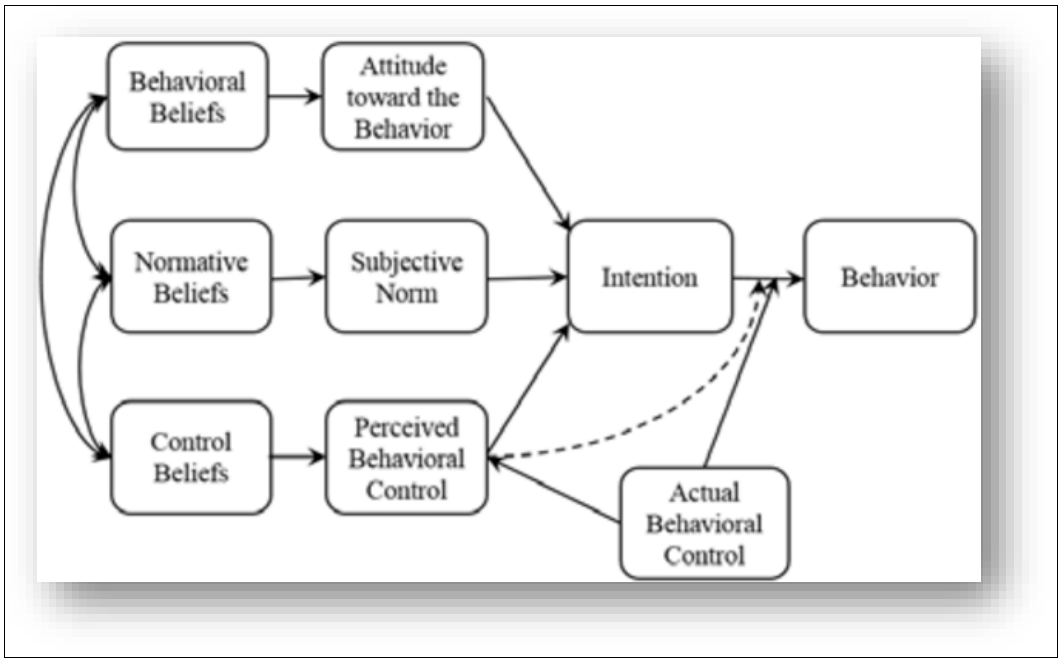


Figure 21: Theory of Planned Behavior (Ajzen, 1985, 1991)

Behavioral beliefs influence "attitude towards the behavior", normative beliefs impact "subjective norms" and control beliefs impact "perceived behavioral control". Similar to The Theory of Reasoned Action, there are some limitations to TPB as well. Despite improvements from TRA, TPB does not address how behaviors are planned or the correlation between planned behaviour and TPB (Eagly and Chaiken, 1993). According to Taylor and Todd (1995), models like TRA and TPB are dependent on individuals being self-motivated to perform a behavior. Moreover, the introduction of PBC in TPB is proposed as a universal solution to all non-controllable variables of behaviour. To address the restrictions of TPB, modifications have been made over time, such as the Decomposed Theory of Planned Behaviour put forth by Taylor and Todd to generate more comprehensive insight.

2.3.3 Technology Acceptance Model (TAM)

Davis (1986) introduced the technology acceptance model (TAM) model as an extension of TRA. In this model, "attitude towards the behavior" was replaced with "perceived usefulness" and "perceived ease of use", and "subjective norms" was removed from the model. Here, "perceived usefulness" refers to the enhancement in performance due to using a particular system, and "perceived ease of use" refers to how easy a system is to use (Davis, 1989). Both "perceived usefulness" and "perceived ease of use" are impacted by external variables and affect the attitude toward using any particular technology. According to the model, "perceived ease of use" also impacts "perceived usefulness", and "perceived usefulness" has a direct impact on behavioral intention as well. Variables like characteristics of the technology, design, implementation nature, awareness about the technology, etc. can act as external variables (Davis and Venkatesh, 1996). The variables 'amount of time using, frequency of use, actual number of usages and diversity of usage' are indicators of actual behaviour.

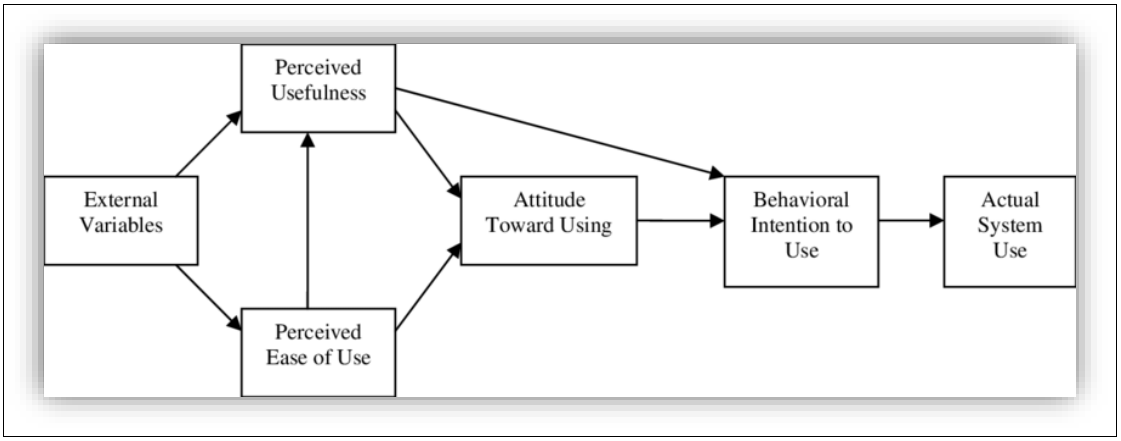


Figure 22: Technology Acceptance Model (Davis, 1986)

Over the years, multiple researchers have extended the TAM model in specific sectors and included multiple factors. Wixom and Todd (2005) extended the model in 3 different ways. Han (2003) added the phases of development to the model. The three phases of development are

adoption, validation, and extension. A meta-analysis conducted at a later date by Lee et al. (2003) proposed that the evolution can be split into introduction, validation, extension and elaboration distinctly. TAM was tested across a diverse range of IS applications as well as adapted to many organizational cultures. During the validation phase of the model, the first stage was to validate the PU and PEOU instruments of TAM. The next stage consisted of validating the existence of a causal relationship between the components of the model.

The approaches adopted by Ajzen and Davis were different in the respect that TAM is acknowledged to be developed for the IS field while the Theory of Reasoned Action and the Theory of Planned Behaviour are based in the domain of psychology.

The primary limitation of TAM is that usage is measured by data that is self-reported by respondents. This assumes that self-reported usage is a valid representation for actual usage. Moreover, the sample choice of respondents also poses a further limitation. The conflicting causal relationship between the construct components of the model and the extent to which TAM possess explanatory power has also been questioned by researchers.

2.3.4 Theory of Diffusion of Innovation (DOI)

The communication of a process through certain channels over time among members of a social system refers to the concept of diffusion. Here, communication refers to the process which is centered around the encoding and decoding of messages perceived to be innovative ideas. Ideas which are unprecedented or 'new' are deemed to be risky in nature due to the uncertainty linked to their outcomes. The four key elements in this regard are "innovation", "communication channels", "time", and "social system". (Rogers, 2003) The study of Ryan and Gross (1943) marks the formulation of the theory of diffusion of innovation (DOI). However, while the

aforementioned scholars are credited to coining the phrase 'diffusion', there were earlier works by different sociologists and anthropologists in this paradigm. According to D (1999), the objective of the theory of DOI is "to provide individuals from any discipline interested in the diffusion of an innovation with a conceptual paradigm for understanding the process of diffusion and social change."

According to Al-Qeisi (2009) and Fichman (1992), DOI introduces factors that influence the adoption and implementation of technology like "innovation-decision process", "attributions of the innovation", and "innovators' characteristics". "Innovation-decision process" is a five-stage process from acquiring the first knowledge about an innovation to confirmation of making the decision. These five stages consist of: knowledge, awareness-knowledge, how-to-knowledge and principles-knowledge. Rogers proposed that innovation can be adopted without the presence of principles-knowledge, however this might result in discontinuance due to improper usage of the new idea. He put forth that principle's knowledge can be acquired through formal education, while awareness-knowledge can be achieved through the consumption of mass-media contents. "Attributions of innovation" stress on how differences in innovation affect the rate of adoption (Rogers, 2003). These attributes are intrinsically correlated; however, each has its own specific conceptual backing. Selection of these attributes are done on the basis of secondary research as well as to enable universality. "Innovators' characteristics" address the different adoption patterns of individuals. Individuals are classified into groups on the basis of the point in time at which they adopted a new idea or their readiness to adopt innovation. When adoption of innovation is plotted against time, the result yielded generally follows a bell-shaped, non-symmetrical curve.

While TAM and DOI are based in different domains of work, the similarities between the two theories, such as the parallel between the complexity attribute and PEOU component of TAM, result in their mutual conformance. The Theory of Diffusion of Innovation has been featured in multiple research papers and studies, especially studies relevant to consumer perception of IS and its impact on adoption rates. However, while a probable rate of adoption can be inferred from the application of the DOI Theory, it allegedly does not provide evidence-driven conclusion to how attitude impacts actual behaviour in respect to accepting or rejecting decisions, and the role played by innovation characteristics or attributes in this process.

2.3.5 Technology Organization Environment (TOE) Framework

Tornatzky and Fleischer (1990) introduced the technology-organization environment (TOE) framework explaining how "technological context", "organizational context", and "environmental context" influence the adoption and implementation of technology in organizations on a company-wide level. The technological context consists of the multitude of different technologies that are applicable for the firm or organization, including technologies both currently being capitalized by the firm and technologies which are not in use but available in the market. Organizational context implies attributes and resources of the entire firm, inclusive of processes such as internal communication and the size of the firm. Lastly, external factors such as the regulatory framework and the structure of the industry in which the organization operates is addressed by the environmental context. Technological innovation is affected by all three of these variables.

Models like TRA, TPB and TAM explain the adoption of technology at individual levels. In contrast, the TOE framework looks at the adoption of technology from an organizational point of

view. Oliveira and Martins (2011) later summarized the applications of the TOE framework. In the empirical studies conducted to validify the TOE framework, different factors were employed by research for technological, organizational, and environmental aspects. This can be attributed to the fact that different technologies or innovations possess different characteristics that impact the adoption. This can be applied to distinct cultural context or the dynamics of distinct industries as well.

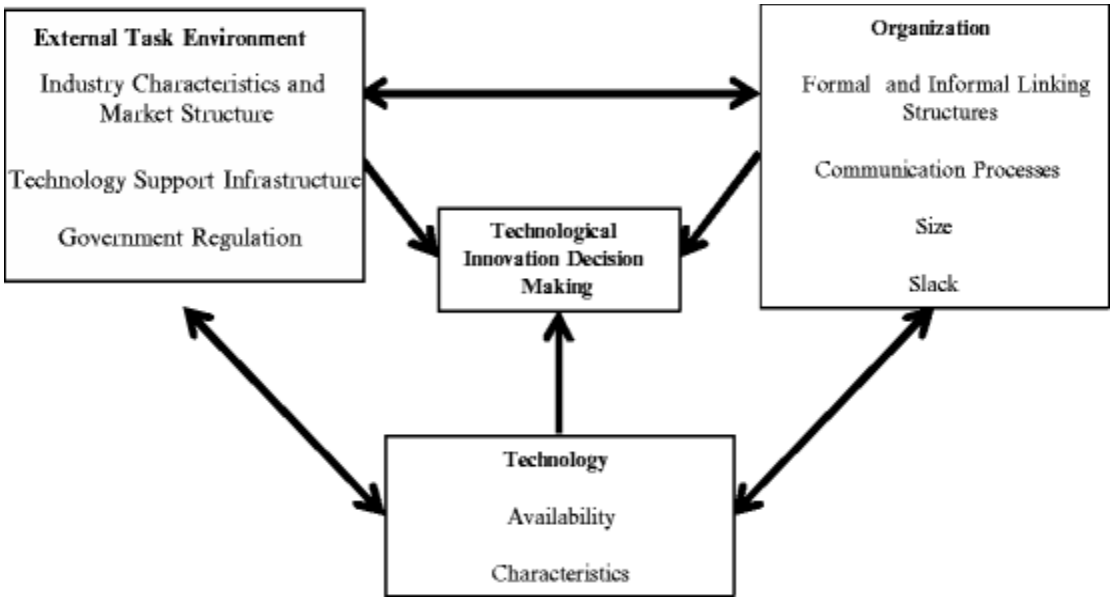


Figure 23: Technology-Organization Environment Framework (Oliveira and Martins, 2011)

Despite wide use of the TOE framework, the framework has gone through limited theoretical developments because it lacks competitive explanations and is in line with other theories of technology acceptance (Baker, 2012). This theory has not received substantial critique or focus, and thus the development of the theory over time has been marginal. Similarly, Zhu and Kraemer (2005) attribute the TOE framework's high degree of freedom to add variables if needed to the limited theoretical development of the theory since its inception.

TOE is likely to be an important tool in further empirical studies, and aid both researchers as well as practitioners. The framework can potentially be further enhanced to encompass a more comprehensive response to network externalities and other theoretical synthesis.

2.3.6 Technology Readiness Index (TRI)

Technology Readiness Index (TRI) was introduced by A. Parasuraman in 2000. Parasuraman (2000) defines "technology readiness" as "people's propensity to embrace and use new technologies for accomplishing goals in home life and at work". The index measures "technology readiness" using a 36-item scale, with a fully anchored 5-point scale.

Over the years, technology has become a key component in company-customer interactions. Quite simply, technology has revolutionized the fundamentals of business. In order to explain the nature of customer-company interaction, Parasuraman (2000) previously proposed the "pyramid model" of service marketing. The model was an extension of the 'triangle model' of Kotler (1994). With the growing importance of technology in the sphere of businesses, readiness of adopting technology became a bigger question. This led to the development of TRI. While TAM focuses on the acceptance of an individual towards any particular technology, TRI focuses more on the set of beliefs towards any technology in general.

An individual can have both positive and negative feelings towards any technology separately or together. These two feelings have opposite kinds of effect on the adoption of any technology. TRI addresses four dimensions, namely "optimism, innovativeness, discomfort, and insecurity", to explain the two opposite kinds of feelings. "Optimism" and "innovativeness" act as the enablers of technology readiness, whereas "discomfort" and "insecurity" act as the limiting

factors. These four dimensions are distinct, so individuals can experience varying levels of technology-related characteristics.

To address the issues that were collectively experienced from the application of TRI 1.0 over time, modifications were made to the theory. An innate issue regarding a scale developed to measure attitude towards technology is the dynamic pace at which technology itself continues to evolve. Technologies in the present day were unprecedented during the development of many of the theories that are widely referenced in this field, including TRI1.0. There was also a methodological limitation, in respect to the length of the 36-scale item that was in use originally. TRI 2.0 was proposed by Parasuraman and Colby (2015). The updated model uses a 16-measure scale to address the changes since the first model was proposed. Simultaneously, the updated model was more streamlined and concise. The four dimensions of TRI 2.0 possess high reliability and consistency when it comes to factor structure. This supports the trait validity of the model, in addition to empiric evidence substantiating the construct validity as well. Despite significant developments, TRI 2.0 is not devoid of limitations, as specific subscales lack a strong psychometric criterion such as AVE.

The development of TRI 2.0 enhanced the applicability of the model, due to the decreased burden at time of conducting the surveys. This also makes TR a crucial moderating factor in research that features multivariate frameworks. As TRI2.0 can predict both actual behavior and behavioral intention of performing technology-related behaviour, this model can be used as a psychographic variable. The potential for application of TRI2.0 in future research - empiric and scholarly both, outside of the general applications, can have a positive impact on the practical implementation of the TR construct as well as its adaption into scientific research.

2.3.7 Summary of the Models

The previous discussion illustrates how TRA was formed in light of previous theories of attitude, and how TRA was later extended to form TPB, TAM and DOI. These theories focus on how individuals accept technology. On the other hand, the TOE framework takes an organizational point of view, and gives a high degree of freedom to integrate variables to the models. To summarize the theories,

Table 5: Summary of Technology Acceptance Models

Model	Focus	Postulated By	Determinants
TRA	Individual	Ajzen and Fishbein, 1980	Attitude towards the Behavior, Subjective Norms
TPB	Individual	Ajzen, 1985	Attitude towards the Behavior, Subjective Norms, Perceived Behavioral Control
TAM	Individual	Davis, 1986	Perceived Usefulness, Perceived Ease of Use
DOI	Individual	Rogers, 1983	Attributions of the Innovation, Innovators Characteristics
TOE	Organization	Tornatzky and Fleischer, 1990	Technological Context, Organizational Context, Environmental Context
TRI	Individual	Parasuraman, 2000	Optimism, Innovativeness, Discomfort, Insecurity

The constructs described in the above technology acceptance models are considered in this thesis. Besides, studies in similar research settings are also reviewed and analyzed to develop the proposed conceptual models for studying the adoption of MFS, internet banking and online marketplace.

2.4 Study on e-commerce adoption in Bangladesh

In Bangladesh, not so much study has been conducted on e-commerce adoption. Researches conducted regarding e-commerce adoption so far mainly focused on growth potential, barriers

and challenges. Some other studies have been done focusing e-commerce adoption in SMEs. Islam, (2018) observed the growth and challenges of e-commerce in Bangladesh. The study found that Bangladesh has a great growth potential for both B2B and B2C e-commerce. It also identified three types of challenging factors; technological, socio-economic, and political factors; and further investigated the socio-economic factors (Islam, 2018). Bhowmik, (2012) assessed the then status of e-commerce adoption in Bangladesh. This study observed that Bangladesh Government is also taking some actions to facilitate and encourage e-commerce adoption (Bhowmik, 2012).

Azam & Quaddus, (2009) studied the impacts of different organizational characteristics on the e-commerce adoption in the context of SMEs in Bangladesh. The study concluded that organizational characteristics do have significant effects on e-commerce adoption and identified six organizational characteristics that are affected by e-commerce adoption of the SMEs in Bangladesh: size, business experience, internet usage experience, IT resources, financial strength and profit as percentage of the revenue of the organization (Azam & Quaddus, 2009). Noor & Noor & Arif (2011) studied the factors affecting adoption of B2B electronic commerce by the SMEs in Bangladesh and tried to measure their effects in explaining the adoption rate. According to the study, positive perceptions of observability, compatibility, internet use and number of IT literate officials cause higher adoption of e-commerce whereas higher perceived complexity and uncertainty cause lower adoption (Noor & Arif, 2011).

Azam, (2006) observed the impacts of buying cultural and infrastructural forces in realizing B2C e-commerce in Bangladesh. The study found that buying culture of the customers is negatively related to the operation of B2C e-commerce in Bangladesh while infrastructural forces are

significantly positively related (Azam M. S., Implementation of B2C E-Commerce in Bangladesh: The Effects of Buying Culture and E-Infrastructure, 2006).

Rahman and Sloan (2017) extended the TAM model by adding three factors in adoption of mobile commerce in the developing world. The factors were perceived risk, perceived cost, and personal awareness. All survey respondents were from Bangladesh in this study. It also further reaffirmed the need of extending TAM model in the context of mobile commerce, to address both its transactional and non-transactional components. A study by Hoque, Ali and Mahfuz (2015) concluded that perceived usefulness was the most important factor in describing adoption of ecommerce in Bangladesh. Computer self-efficacy, perceived credibility, and perceived ease of use have significant impact as well. Another study by Islam, Hoque and Sorwar (2016) highlighted that computer attitudes have negative impact on customer's intention to use e-commerce system. Another study by Rahman, Sloan and Low (2011) concluded that perceived risk and perceived usefulness were the two most important determinants of m-commerce adoption.

Hoque, et al. (2015) tried to determine the factors that influence the adoption of e-commerce services in Bangladesh using extended version of Technology Acceptance Model (TAM). The study concludes that four constructs, Computer Self Efficacy, Perceived Credibility, Perceived Usefulness and Perceived Ease of Use, have significant impact on e-commerce adoption. The study also identified that Perceived Usefulness is the most important factor in describing user's adoption of e-commerce (Hoque, Ali, & Mahfuz, 2015). Azad & Hasan, (2011) used Rogers's theory of diffusion of innovation as the theoretical foundation to study the e-commerce adoption behavior in Bangladeshi SMEs. The study found that the effects of perceived compatibility, complexity, observability and uncertainty, company internet usage and number of computer

literate officer has significant contribution in explaining the intention of adoption of e-commerce (Azad & Hasan, 2011). Azam & Quaddus, (2013) used Hofestede's framework to assess national culture along with two fundamental antecedents of TAM, perceived usefulness and perceived ease of use, to examine the influence of national culture on the adoption decision and use of ICT by Bangladeshi SMEs (Azam & Quaddus, Examining the influence of National Culture on Adoption and Use of Information and Communication Technology: A Study from Bangladesh's SME Perspective, 2013).

2.4.1 Study on Adoption of Mobile Financial Services

With increased use of smartphones and higher internet penetration, a change can be seen in the use of payment methods. Over time use of traditional payment methods like cash, debit and credit cards have been on the fall and the use of mobile financial services (MFS) has been on the rise. A proof of the promise and growth of MFS is the entrance of new MFS providers. Interestingly, the entrants into this sector come from a diverse pool of sectors, including banks and telecommunication operators. According to Shrier et al. (2016), companies from the retail, telecommunications and banking industries are entering the MFS space to facilitate the mobile based consumption of their services. Despite all these factors, there have been only a few studies trying to understand the factors behind the adoption and intention to continually use MFS platforms.

Multiple researchers have conceptualized mobile payments and financial services from different perspectives. Liebana-Cabanillas et al. (2015) stress on the use of a mobile device for transactions to define mobile payments. The three benefits of such payments are convenience, safety and simplification of payment transactions. Schierz et al. (2010) described mobile

payments from a consumer's perspective. They define mobile payments to purchases instigated and processed via a mobile phone. Dahlberg et al. (2008) addressed mobile payments from a device perspective. Mobile payments incorporate the use of wireless communication technology.

Currently, Bangladesh is going through a massive technological transformation. The impact of this can been across all service sectors. This is also in line with the long-term goal of 'Digital Bangladesh'. On the basis of the size of the subscriber base, mobile financial services (MFS) and agent banking are two of the most popular transaction methods under digital financial services (DFS). Among these two, MFS is the more popular in terms of the number of users. Interestingly, the rise of MFS also provides with the opportunity of higher financial inclusion and reaching out to individuals that banks could not have done in the past. According to Bangladesh Bank data, there are 183,055 thousand registered clients of MFS as of August 2022. Out of these, 67,127 thousand are active accounts. The average daily transaction of MFS in August 2022 was BDT 2,821 crore. The daily average number of transactions was around 13 million in August 2022. Around BDT 330 crore came as inward remittance through MFS operators in the same month. One point to remember in this regard is that there is seasonality in the inward remittance data. Currently, MFS services are provided by 13 banks including BRAC Bank, Dutch-Bangla Bank, Rupali Bank, Islami Bank, United Commercial Bank, Southeast Bank, NCC Bank, and Trust Bank. The market leader is bKash of BRAC Bank, followed by Nagad and Rocket.

According to Chikalipah (2017), mobile payments indirectly improve the living standards of the population. This happens as MFS engages the unbanked population and increases financial inclusion of the country. This integration also brings this exclusive population to the mainstream economy. A similar case can be seen in Bangladesh as well. The benefits stemming from MFS is

not only limited to integrating the unbanked population to the mainstream economy. It also creates multi-faceted opportunities. It enables individuals to earn money, create new business ventures. Overall, mobile payments are a source of empowerment in developing nations, especially for the unbanked population. An example of such empowerment can be seen in Kenya. 2% of the households in Kenya have escaped extreme poverty by using MFS (GSMA, 2015).

According to Bhattacharjee (2001), one of the sources of corporate failure of mobile payment apps is the irregular and ineffective long-term use of new technology. This is why studying the factors behind the adoption of continuance usage of mobile payments is important. Thong et al. (2006) stressed that the adoption of a technology like mobile payment cannot be considered a success until there is the intention of using it continuously.

Traditionally countries transition from cash to debit and credit cards. This provides the benefit of not carrying large sums of cash everywhere, safety of making payments, and also brings all the transactions in the banking process. To take it one step further, MFS eradicates the need of carrying cards everywhere (Tan et al., 2015). It also has additional benefits like transactions through mobile phone, scope to check balances, ability to initiate and authorize transactions regardless of time and location (Herzberg, 2003).

Value perception is the belief that the use of a certain technology or innovation will improve the performance of the related job (Davis, 1989). Hong et al. (2006) addressed value perception as one of the most important factors of satisfaction and subsequent intention to use continually for any technology. In the context of this study, the practical benefits experienced by the user of the MFS is to be considered as the value perception.

Perceived ease of use refers to an individual perceiving the use of the said technology as easy (Davis, 1989). Susanto et al. (2014) stressed that higher perceived ease of use facilitates individual tasks to be accomplished more than lower perceived ease of use. The rationale behind this is easier to use technology are more accessible and are more likely to impact the adoption of that technology. It can be inferred from this that MFS that are easier to use are more likely to be used more and, therefore, influence the adoption.

On the contrary, the probability of a loss or injury can have the potential to jeopardize the adoption process. These factors are the perceived risk, stemming from the use of the new technology (Pham & Ho, 2015). Mallat (2007) pointed out that the risk factors in the adoption of mobile payments have a negative impact on customer satisfaction level. Consumers do not prefer MFS that add additional costs to the consumers and expose them to various kinds of risk factors.

Thong et al. (2006) postulates that mobile payment services that are considered to deliver value, are easy to use and less risky will increase the satisfaction level of the consumers. Satisfied customers, in turn, create an opportunity to attract new consumers through word-of-mouth communication. Additionally, it becomes a source of repeated business, resulting in a stable and reliable source of revenue. Multiple studies have confirmed that satisfaction is a fundamental driving force for continued use and develop a positive attitude towards the brand (Eriksson & Nilsson, 2007; Mouakket & Bettayeb, 2015; Thong et al., 2006).

Setterstrom et al. (2013) defines continuance intention as the conscious plans of a consumer to repeat the purchase behavior regarding any product or service in the future using a mobile phone. According to Chen et al. (2012) and Hong et al. (2006), consumers' continuance intention is determined by their satisfaction with prior use.

2.4.2 Study on Adoption of Internet Banking

Bangladesh is a very fast-growing country, and the significance of strong banking is immense. Currently, 61 scheduled banks are operating in Bangladesh. The central bank of the country, Bangladesh Bank, supervises all these banks under the Bangladesh Bank Order, 1972 and Bank Company Act, 1991 (Bangladesh Bank, 2021). With the development of various mobile applications and websites, customers have the resources to make financial transactions with just few clicks. Almost all the leading banks of Bangladesh have successfully converted their system to digital which is very sophisticated and is driven by a very strong cyber protection system. Hence, the banking system has evolved over time and slowly digital banking is replacing traditional banking.

From the perspective of sustainable development of a country, internet banking plays a very important role. For example, internet banking provides operational excellence, and creates opportunities for financial inclusion by expanding access to hard-to-reach customer segments covering wide geographical areas. The customers of a bank also get benefit as internet banking ensures extended service hour, timely service delivery, and also increases consumer trust by guaranteeing information availability and so on. Particularly during COVID-19 pandemic, banks continued their operation via internet banking channels and provided banking services to customers.

Even though it is now convenient for the customers to avail almost all types of banking services with the help of digital platforms, the usage is still not up to par in Bangladesh. Despite all the efforts made by the banks to create awareness on their respective digital platforms, the conversion rate from traditional to the digital banking system is still low.

Recent research on the factors affecting internet banking adoption and their utilization among users mostly shows that the accessibility of internet, customer awareness, adaption to change, proper guidance to use internet banking services, trust and goodwill of bank, security concerns, and overall perceived value plays a major role to drive people towards adoption of internet banking services in Bangladesh (Shareef et al., 2018; Khan et al., 2021, Rahaman et al., 2021). In Bangladesh, another research studied internet banking adoption using constructs of TAM such as, perceived usefulness and perceived ease-of-use and added three variables such as, trust, social influence, and perceived enjoyment (Rahaman et al. 2021). Researchers also used conceptual model based on TAM with some added aspects such as social image, perceived risk, and perceived trust, adopted from Muñoz-Leiva et al. (2017), and studied the adoption behavior of users of digital banking applications in Yogyakarta, Indonesia (Mufarih et al., 2020). Another research studied the aspects influencing the intension of using digital banking in Vietnam by considering the constructs such as perceived usefulness and perceived ease-of-use from TAM along with two other variables such as perceived risk and trust (Nguyen, 2020).

According to Philip et al. (1994) and Davis (1989), perceived ease of use is the degree to which a prospective adopter expects new technology to be free from effort. Perceived ease of use impacts the intention of consumers to adopt certain products or services both directly and indirectly. The indirect effect is associated with the perceived usefulness. The easier it is to use a certain technology, the more useful it becomes to the consumer (Venkatesh & Davis, 2000; Dabholkar et al., 1996; Davis et al., 1989). As a result of this, consumers' intention to adopt increases indirectly through the perceived ease of use. Studies by Ndubisi & Sinti (2006) and Gerrard et al. (2006) show that higher levels of technological complexity correspond with lower levels of

consumers' perceived ease of use. This eventually leads to lowered intention of individuals to use internet banking services.

Triandis (1977) proposed the theory of personal behavior, which states that the beliefs towards a technology of an individual, his/her social influencers, experiences or habits, outcomes of using the new technology and the facilitating conditions to use the technology in a conductive environment influences the use of a new technology by an individual. Thompson et al. (1991) further established relationships among different determinants of various personal device usage behavior. The authors found that long-term consequences, job fit, technological complexity and social factors impact the usage behavior. The measurement of technology familiarity requires basic knowledge of new technology, an individual's awareness of the application of the new technology as the facilitating conditions such as demo, training, or user manual that a service provider is providing to the user. Perez et al. (2004) found that both the perceived utility of the new technology and the attitude towards technology adoption is positively affected the perceived ease of use.

The probability of a loss or injury can have the potential to jeopardize the adoption process. These factors are the perceived risk, stemming from the use of the new technology (Pham & Ho, 2015). Mallat (2007) pointed out that the risk factors in the adoption of mobile payments have a negative impact on customer satisfaction level. According to Ndubisi & Sinti (2006) and Rotchankitumnuai & Speece (2003), perceived risk plays a critical role in affecting individual decision to accept or reject a new technology.

Aldas-Manzano et al. (2009) addressed perceived risk as something subjective related to the consumers. Since the factors differ from person to person, defining perceived risk is a complex task. However, it is comparatively easier for internet banking services. The reason behind this is

that the perceived risk factors might have an adverse impact on the behavioral intention of an individual to adopt internet banking services (Wang et al., 2003). There are five dimensions of perceived risk associated with internet banking (Sathye, 1999; Gerrar & Cunninghham, 2003), Cheng et al., 2006; Furnell & Karweni, 1999; Littler & Melanthiou, 2006; Jayawardhena & Foley, 2000, Suganthi et al., 2001):

1. Security Risk
2. Privacy Risk
3. Performance Risk
4. Time Loss Risk
5. Social Risk

According to Kotler & Keller (2009), satisfaction can be a person's feeling of pleasure that results from comparing a product's perceived performance or outcome with their expectations. Customer satisfaction is the consumer's response to the evaluation of the perceived discrepancy between prior expectations and the actual performance of the product or services as perceived after its consumption (Tse & Wilton, 1988). It can also be defined as a positive feeling experienced by customers after consumption of a product or services. So, if internet banking services are considered as value additive, easy to use, little or no exposure to risks, their satisfaction level with the new product or service will be lifter (Thong et al. 2006). Earlier studies also showed that customers' satisfaction is a key driving force for continued usage intention and positive brand attitude (Eriksson et al., 2007; Mouakket et al., 2015; Thong et al., 2006).

2.4.3 Study on Adoption of Online marketplace

Batra and Arora (2020) divide e-commerce into upstream (business-to-business) and downstream (business-to-consumer) activities. According to Singh (2019), there are primarily five types of e-commerce companies: business-to-consumer (B2C), business-to-business (B2B), consumer-to-consumer (C2C), consumer-to-business (C2B) and business-to business (B2B). In B2C e-commerce, the transactions take place between businesses and the end customers. Sellers get an access to diverse demographic segments through the internet. This study only focused on Online companies in Bangladesh.

Due to socio-economic differences, there might be differences in adoption of e-commerce across countries. Especially, gaps in technology and the adoption of technology between developed and developing countries result in differences in adoption of e-commerce (Batra and Arora, 2020). Although there has been significant research on the adoption of e-commerce in developed countries, very few have focused on the adoption in developing countries.

Within less than a decade of the first e-commerce company in Bangladesh, there are more than 1,500 members of the e-Commerce Association of Bangladesh (eCAB). Most of these e-commerce countries operate in B2C space. According to eCAB, BDT 3,000 crore has been transacted only in the last six months of 2021. During this period, services were provided to 6 million people with an overall digital transaction amount of BDT 16,000 crore. (e-Commerce Association of Bangladesh (e-CAB), 2022)

In line with Bangladesh government's agenda of 'Digital Bangladesh' under Vision 2021, steps have been taken to develop human resources, connect citizens, take services to the doorsteps of all citizens, and make more use of technology in the private sector and market. Leveraging the

rising penetration on top of the steps taken by the government, the e-commerce sector of Bangladesh has seen substantial growth in recent years. With the objective of ensuring transparency and accountability in the digital business system, 'Digital Commerce Operation Guidelines, 2021' were issued on the 4th of July 2021. The guidelines lay down basic rules for all digital commerce businesses to conduct business within Bangladesh and came as a successor to 'National Digital Commerce Policy, 2018'.

In line with the steps taken by both public as well as the private sector, and the rising internet penetration of the country, the e-commerce sector has seen a meteoric rise in recent years. The entrance of global e-commerce giants like Alibaba entering Bangladesh by acquiring Daraz and the opening of new e-commerce sites by local conglomerates like Walton and Unilever are proofs of the rising popularity of e-commerce within the country. According to the International Trade Administration of USA (2021), there are more than 50,000 e-commerce pages on Facebook and more than 2,000 e-commerce sites in Bangladesh. The e-commerce market is projected to almost double in market size and reach USD 3 billion by the end of 2023 from USD 1.6 billion of 2019.

As mentioned earlier, socio-economic conditions differentiate the adoption of e-commerce across countries. Multiple studies have laid out the key drivers and inhibitors of B2C e-commerce in developed countries. Ho et al. (2007) identified internet penetration, telecommunication investment intensity, education level, and regional contagion as the factors influencing e-commerce adoption in 17 European countries. According to Hong and Zhu (2006), technology innovation, web spending, web functionalities, and partner use are the key factors for e-commerce adoption in America and Canada. Wong (2003) identified demographic structure, physical infrastructure, human resources, financial and legal institutions, and e-commerce policy

initiative as key determinants of e-commerce adoption in Singapore. Li and Xie (2012) highlighted managerial attitudes, corporate strategies, external pressures, and firms' technology strengths as four key drivers in e-commerce adoption. However, much work is yet to be done to understand the drivers and inhibitors in the e-commerce landscape of developing countries. In fact, all the forces will not be similar across all developing countries. Thus, more focus is required to understand the e-commerce scenario of Bangladesh.

Singh (2019) explored the opportunities and challenges in the e-commerce industry of India and addressed that e-commerce companies have to stress on to accelerate growth include customer experience, digital infrastructure, technological advancements, operational framework, delivery experience, addressable markets, tax and regulatory environment, convergence of online and offline channels, customer acquisition, and payments and transactions. Similar factors can be seen in the adoption of e-commerce in other South Asian countries as well.

How a user perceives the value of a new technology is one of the key factors behind satisfaction and continued intention towards that technology (Hong et al., 2006). According to the Technology Acceptance Model (TAM), perceived ease of use and perceived usefulness directly and indirectly impact the intention to adopt a product or service (Davis, 1989). Perceived ease of use refers to the adopter's expectation of a new technology being free from effort (Philip et al., 1994; Davis, 1989). The theory of reasoned action (Ajzen and Fishbein, 1980) posits that the behavioural intentions, which are the immediate antecedents to behavior, are a function of salient information and beliefs about the likelihood that performing a particular behavior will lead to a specific outcome. Ajzen and Fishbein (1980) divide the beliefs antecedents to behavioural intentions into two conceptually distinct sets- behavioural and normative. The behavioural beliefs are postulated to be the underlying influence on an individual's attitude toward

performing the behavior, whereas the normative beliefs influence the individual's subjective norm about performing that behavior (Madden, Ellen and Ajzen, 1992).

Although rapidly expanding, e-commerce in Bangladesh is still a relatively new phenomenon. One of the key growth factors of the e-commerce in Bangladesh has been the high GDP growth of the country itself. On top of that internet subscribers has grown at substantial rates. Currently, there are 36 million active social media users in Bangladesh. Among them, 8.4 million use Facebook. The Facebook commerce (f-commerce) is itself worth BDT 312 crore. Overall, the industry has grown by 100% in the last three years according to eCAB sources. (Sameh, 2021) He further attributes the growth of e-commerce in Bangladesh to the positive attribute of the people of the country towards it. He further stressed on the positive attitude of the young population aged between 18 and 24. Kabir et al. (2020) states that 5 lac people would engage in this industry in the upcoming 5 years. According to Faruq (2017), consumers prefer e-commerce due to factors like rapid urbanization, increase in internet and mobile penetration, and development of technology. According to Azam (2007), implementation of e-commerce and e-infrastructural forces have a positive impact on B2C e-commerce in Bangladesh, whereas the buying culture has a negative impact.

E-commerce companies in Bangladesh have not yet been able to gain the trust of the consumers. As a result of this, 90% of the payments are cash on delivery. On top of that, there is a lack of understanding in both the merchants' and the customers' side. All benefits of e-commerce are not being able to be utilized due to this. (Sameh, 2021) According to Hossain, Sarker, and Xiaohua (2018), lack of access to information and poor to absence of infrastructure as key hindrances to e-commerce in developing countries. They further identify poor knowledge and awareness, online transaction, cash on delivery, online security, logistics and shipment services,

goods packaging, fear and fraud factor, physical touch of goods, product quality, tax structure, and customer and social relationships as possible factors of challenges, threats, and opportunities of e-commerce in Bangladesh. Mohiuddin (2014) addressed poor online banking connectivity, slow and expensive internet services, bureaucratic complexities, and lack of awareness as barriers of e-commerce in adoption of e-commerce in Bangladesh. Certain business segments have adopted e-commerce and gained success. He further stressed that "synergy between telecommunications and information technology has the proven capability of monitoring and administering the real-time transactions".

2.5 Chapter summary

This chapter analyzes the e-commerce situation of Bangladesh in details. It starts with comparing the condition of Bangladesh with India, Pakistan, Sri Lanka, Egypt, South Africa, Nigeria, Vietnam, Indonesia, Malaysia and Singapore. Then it describes some theories and models of technology acceptance such as Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB), Technology Acceptance Model (TAM), Technology Readiness Index (TRI), Theory of Diffusion of Innovation (DOI) and Technology–Organization–Environment (TOE) framework and then summarizes the models. After that it presents the researches on e-commerce adoption in Bangladesh including the studies related to Mobile Financial Services, Internet Banking and Online marketplace.

2.5.1 e-commerce situation of Bangladesh

Despite a lot of advances, ecommerce is still in its nascent stage in Bangladesh. The country has seen triple digit growth figures in recent years; however, the absolute number of ecommerce users still remains to be a fraction of the population. But the country shows much potential in

terms of growth in the coming year. Internet and technology adoption are increasing at a significant rate. Studies have found that adoption of ecommerce is different for developing countries in comparison to that of developed countries. This means that the factors contributing to the adoption of ecommerce in Bangladesh will be different from those of other developed countries where ecommerce penetration is already high.

Currently, Bangladesh ranks in the lower tiers of indices like UNCTAD B2C Ecommerce Index, ICT Development Index (IDI), and Network Readiness Index. The UNCTAD B2C E-commerce Index measures an economy's preparedness to support online shopping. IDI monitors and compares the development of ICTs in countries through 11 indicators covering ICT access, ICT use, and ICT skills. Network Readiness Index (NRI) is a framework, which assesses the factors, policies, and institutions that enable a country to fully leverage information and communication technologies (ICTs) for inclusive, sustainable growth, competitiveness, and well-being. These indicate that much work is yet to be done in the field of adoption of ecommerce in Bangladesh. Additionally, many studies have used widely established models like Technology Acceptance Model (TAM) to identify the factors relevant to the adoption of ecommerce in the respective countries. But rigorous studies are yet to be carried out to identify similar determinants of ecommerce adoption using established technology acceptance models.

2.5.2 Theories on technology acceptance

Multiple theories have been postulated by researchers to identify the determinants of technology acceptance. Ajzen & Fishbein (1980) proposed the 'Theory of Reasoned Action' (TRA) to explain the determinants of technology adoption on an individual level. This theory was later extended by Ajzen (1985) to 'Theory of Planned Behavior' (TPB). Perceived behavioral control

was added to attitude towards the behavior and subjective norms of the previous model as the determinants. Later, the 'Technology Acceptance Model' (TAM) was proposed by Davis (1985). This is currently one of the most widely used models in the field of identifying the factors contributing to the technology acceptance. The model focused on perceived usefulness and perceived ease of use. Later, it was extended by many other researchers. The 'Theory of Diffusion of Innovation' (DOI) was postulated by Rogers (1983) and focused on attributions of the innovation and innovators' characteristics. Apart from these, Parasuraman (2000) postulated the 'Technology Readiness Index' (TRI) and identified optimism, innovativeness, discomfort, and insecurity as the four determinants of technology acceptance. Torntzky & Fleischer (1990) changed the focus to the organization level and postulated the 'Technology-Organization Environment' (TOE) framework.

2.5.3 Studies in Bangladeshi context

The main focus of the critical review of literature is to gain insights for developing conceptual frameworks for this thesis. Similar researches in similar context have used models like TAM. Some researchers also used context specific constructs and extended the models for their study. This thesis considered such context specific constructs as well for developing the conceptual frameworks discussed in the following chapter. But very few studies have covered the ecommerce adoption situation in Bangladesh. Most studies have focused on growth potential, barriers, and challenges (Islam, 2018; Bhowmik, 2012). Some of these studies have focused on more specific groups like Small and Medium Enterprises (SMEs) and tried to find the factors affecting adoption of B2B e-commerce (Azam & Quaddus, 2009; Noor & Arif, 2011). While some other researches focused on B2C e-commerce and tried to explain the adoption behavior of the individual consumers using models like TAM. Some study extended TAM in Bangladeshi

context and tried to identify prominent factors affecting e-commerce adoption (Rahman and Sloan, 2017; Islam, Hoque and Sorwar, 2016; Hoque, Ali and Mahfuz, 2015). These studies are discussed in details in the above sections.

Despite all these researches, there is still a major gap in understanding and explaining the e-commerce adoption behavior of Bangladeshi consumers. So, to better understand ecommerce adoption in Bangladesh, the thesis sub segmented e-commerce study into three arears: adoption of Mobile Financial Services (MFS), Internet Banking, and Online Marketplaces.

3 Chapter 3: Research Approach and Methodology

This chapter describes the research approach of the study followed by the proposed conceptual frameworks to be used in this thesis, sampling and data collection plan, data analysis plan and ethical considerations.

3.1 Research Approach

This section analyzes the nuances of different research philosophy (, e.g., "positivism vs interpretivism"), approaches (e.g., "quantitative vs qualitative"), and strategies (e.g., survey vs case study) in light of the e-commerce industry of Bangladesh. Subsequently a decision is made regarding what method is undertaken to conduct the research and a conceptual framework is developed.

Johnson and Clark (2006) state that, in the field of business and management research, it is necessary to have the awareness of the philosophical commitments that are made through the choice of research strategy, because this will have a significant impact on what is done in the research as well as have a clear understanding of what is being investigated. According to Fitzgerald and Howcroft (1998), "positivism vs interpretivism" is one of the paradigms of research approaches in the study of social science and information systems. Weber (2004) defines the differences between positivism and interpretivism as follows:

Table 6: Difference between Positivism and Interpretivism (Weber, 2004)

Positivism	Interpretivism
1. The researcher and the reality are separate.	1. The researcher and the reality are the same.
2. The reality is objective.	2. Knowledge is based on experiences and is not objective.

Positivism	Interpretivism
3. The research objects are independent of the researcher.	3. Research objects are studied based on the experiences of the researcher.
4. Positivists generally use laboratory experiments, field experiments, and surveys as research methods.	4. Interpretivists use case studies, ethnographic studies, phenomenographic studies, and ethnomethodological studies as research methods.

Bell, Bryman, and Hartley (2018) associates understanding how people react instead of other relevant factors to interpretivism. Saunders et al. (2009) opined that the nature of interpretivism is subjectivist. They argued that, in interpretivism, researchers put themselves in the respondents' shoes and then collect such data that have worth to the study participants. The researchers then interpret the data as per their knowledge and thus incorporates their understanding of data into the research process. Interpretivism considers the difference of humans from physical phenomena. However, in the case of ecommerce the key objective is to identify objective factors that affect the acceptance. Positivism will separate the entities of the researcher and the research object and can be validated with the outputs of other researchers. In fact, technology acceptance research is mostly driven by positivism (Al-Qeisi, 2009).

- Thus, a **positivist philosophy** is undertaken in this research.
- In terms of research approaches, a **mix method comprising both quantitative and qualitative approach** is adopted.

Quantitative and qualitative methods can be combined for complimentary purposes and their combination will generate more exhaustive results than the two methods being used separately. Morgan (1998) argued that the two methods can be combined without violating any assumptions on the technical aspect. He further addressed how the two methods can be combined by selecting a principal method and forming a matrix. Sieber (1973) (cited in Johnson et al., 2007) addressed

how the two approaches can be united at various phases of research process. Al-Qeisi, (2009) opined that quantitative data gives objective starting point at the data collection stage and qualitative data enables the researcher to generalize the quantitative data and provide a new viewpoint on findings. Lastly, while analyzing the data, qualitative facts play a crucial role in understanding, illuminating, delineating, and confirming quantitative findings.

In this study, data is collected through survey questionnaires. According to Saunders et al. (2009), "survey strategy can be used to suggest possible reasons for particular relationships between variables and to produce models of these relationships." Surveys help to get a complete picture of any phenomena from different points of views. Data are collected through questionnaires or structured interviews. Subsequently the data collected are analyzed to derive generalizations. A greater number of variables can be studied through surveys. The greater number of variables depict a more accurate description of real world and help to create more appropriate generalizations. However, there are risks of bias from both the respondent and the researcher. (Galliers, 1993).

3.2 Conceptual framework development

To examine the adoption behavior of the individual consumers in the context of Bangladesh, the thesis developed three conceptual frameworks for the three study areas. The conceptual frameworks are similar, but due to the variances in respondents' profile and data collection requirements of the three study areas, three separate frameworks are proposed in this thesis. For example, the framework for MFS includes constructs like value perception and perceived risk which is very appropriate in Bangladeshi context. Because, Bangladeshi people do not want to adopt any new technology unless they are convinced that the service they will get is worthy of

using at the expense they are paying for it. Also, the risk perception plays a vital role in attracting consumers to use any technology based service.

For internet banking adoption, two new constructs, customer service and technology familiarity, is added along with the above mentioned two constructs to assess the adoption behavior of consumers. Because, Bangladeshi bank account holders are unwilling to adopt internet banking services initially. But as mentioned by the industry experts, good customer service attracted them to avail this service in recent times. Technology familiarity also plays an essential role in this case as with the advent of smartphones, people are getting familiar with app based services now-a-days. Some Bangladeshi banks, by introducing their own mobile banking app, are taking advantage of that. Therefore, technology familiarity is included in the conceptual framework for exploring the adoption behavior of internet banking.

And for studying adoption of online marketplace, trust is introduced as an important construct to the proposed framework as it has substantial impact on adoption behavior as it is related with product quality, on time delivery and also competitive pricing of any product item listed in the online marketplace.

These three frameworks substantially cover the major areas relating to the study of e-commerce adoption behavior of the individual consumers in the context of Bangladesh as mentioned earlier in section 1.4. The frameworks are devised based on existing theories of technology acceptance and opinion of the industry experts. Models used by similar studies in different contexts are considered while selecting an established model for this thesis. The conceptual framework development process is detailed in the following sub sections.

3.2.1 Selection of an existing model: TAM

As a starting point of devising the proposed conceptual framework, the thesis considered the established technology acceptance models discussed in Chapter 2. Among those models, the Technology Acceptance Model (TAM) is a prominent one to predict individual's reactions to acceptance of information systems (IS) in different contexts. TAM is simple and easy to understand and extensively used in similar research settings by different researchers. As mentioned earlier, TAM measures, Perceived Usefulness (PU) and Perceived Ease Of Use (PEOU), and is widely used for studying the acceptance and usage behavior of any IS. Attitude and intention toward use are estimated which ultimately used to predict actual usage behavior. The constructs PU and PEOU can easily be translated to the respondents for data collection. Several studies have been done to measure the effectiveness of TAM. Venkatesh & Davis (2000) found that TAM very dependably accounts for around 40% adjustment in use intentions and behavior. Cheng et al. (2006) identified that TAM is very persuasively and extensively used for foreseeing the behavioral intention to use and the real use of IS. Taylor & Todd (1995) mentioned TAM as an influential framework for measuring system usage and an effective tool for system planning. The robust behavioral foundations of TAM assume that when anyone is ready to believe on anything and intends to form a positive mind set to undertake any action based on that belief, they will undertake the act without hesitation (Bagozzi et al. 1992). This behavioral foundation of TAM is effectively used to get ahead of internet adoption by the end users. Park, (2009) in his study identified TAM to be a good theoretical tool to gauge users' acceptance of e-learning (Park, 2009). Awa, et al. (2015) proposed a framework that integrated the TAM, TPB and TOE framework to predict the IT adaptation of SMEs in a more organized way (Awa, Ojiabo, & Emecheta, 2015). Shi, (2013) argues that Small enterprises rely on e-

commerce to innovate business model. The study systematically reviewed related research about key factors affecting small enterprises E-commerce adoption decision, and established a theoretical model of small enterprises E-commerce adoption decision based on TAM model & TOE framework (Shi, 2013).

Countries such as Bangladesh and other developing countries, which need to catch up in technological adaptation, need help establishing models like TAM. There are multiple reasons for it, including the availability of resources required to establish such models for research. Also, security and privacy are one of the most significant issues for any technology adoption model. Since this is a growing issue, adoption is more challenging in countries where consumers are not reliant on technology. There is also a need for regulatory framework bodies. Lastly, poor internet connection issues also play a significant role in the implications of TAM (Islam & Kabir, 2021). Bangladesh is focusing on more e-commerce establishment targets that still plan to make people used to online marketplaces or dependent on technology. In such cases, TAM needs holistic information for it to stand.

3.2.2 Limitations of TAM

Although TAM is a widely used and prominent model in different research contexts to study the technology adoption behavior, in the context of Bangladesh, TAM cannot fully address all the aspects that are contributing to the adoption of e-commerce.

First of all, TAM has some limitations. The measurement of usage by relying on respondents' self-reports and presuming that self-reported usage represents actual usage is the most evident limitation of TAM (Al-Qeisi, 2009). It means that TAM has a general view of users, and they perceive technology that does not allow for penetration. TAM focuses on a characteristic that

relates to user behaviour, which is inexorably assessed using subjective criteria like behavioral intention (BI) and interpersonal influence. However, interpersonal influence is defined as when a person is influenced by a friend's or coworker's words as the subjective standard (Ajibade, 2018). Thus, the metrics for judging a user's attitude are shallow. Besides, the correlations between the vital TAM characteristics displayed a contradictory pattern. In some research, the relationships were statistically significant, showing the robustness of the TAM model, but in other studies, the opposite was true. Additionally, the relationship between PEOU and PU was significant in the majority of studies; however, some studies did not find this relationship to be significant, and the reasons for these differences could be attributed to the users' experience level or type (professional users have different intellectual capacities, and the less likely the effect of PEOU on PU is the more experienced the users are) (Ajibade, 2018). The PU and PEOU overlook other issues, such as cost and structural imperatives, that push users to adopt an innovation (Lunceford, 2009). The frequent use of TAM has led researchers to re-explain the model numerous times. Thus, it gets criticism as a "theory" incorporate contentious heuristic value, restricted descriptive and foretelling capability, criticism triviality and is short of any practical value (Benbesat & Barki, 2007)." In pursuing relevant knowledge, there have been far too many adaptations of the model, resulting in theoretical havoc and uncertainty. (Malatji et al., 2020).

Secondly, to capture the actual scenario of e-commerce adoption in the setting of Bangladesh, some other context specific factors are necessary to integrate with TAM. The industry expert also advocated in favor of inclusion of such parameters with the basic constructs of TAM to examine the e-commerce acceptance. Constructs from other technology acceptance models which are relevant with current research context can be considered as well to develop the proposed conceptual framework.

3.2.3 Consideration of another model: TRI

Following the discussion from the above sub section, to come to an appropriate framework, the thesis took help of other models by considering the limitations of TAM. One such useful model described in Chapter 2 is Technology Readiness Index (TRI) introduced by A. Parasuraman in 2000. While TAM focuses on the acceptance of an individual towards any particular technology, TRI focuses more on the set of beliefs towards any technology in general. The common determinants of TRI are optimism, innovativeness, discomfort, and insecurity (Parasuraman, 2000). In a study conducted by Hussain and Raghavan (2017) on the ecommerce adoption among SMEs using TRI model, it was mentioned that “Despite the fact that there have been instances of SME success stories, there is more than meets the eye when it comes to recognize and tackle the specific controllable factors which hinder SME's business success.”. According to Shih-Chih and Shing-Han (2010), attituded, subjective norm, and perceived behavioral control are all affected by technology readiness. Astuti and Nasution (2014) conducted a study on the factors affecting ecommerce adoption among entrepreneurs in Indonesia despite its obvious benefits like the scope of expanding consumer base, entering new markets and rationalizing business. The study found that the technology readiness was significantly different across different gender, age, education, and income groups.

In the context of Bangladesh, TRI can be a useful addition to identify the factors impacting the adoption of ecommerce. Additionally, both the roles of drivers, namely optimism and innovativeness, and inhibitors, namely discomfort and insecurity, can be further explored to understand the sets of beliefs towards the technology itself. On top itself, it is also imperative to understand if moderators have an impact similar to the findings of Astuti and Nasution (2014).

Using TRI in addition to other models can be a useful addition as well to have a better understanding of the factors.

3.2.4 Inclusion of other factors in the framework

As per the discussion above, seven important constructs are considered to be added to the proposed conceptual frameworks of the thesis. The constructs are value perception, perceived risk, brand attitude, customer satisfaction, customer service, technology familiarity, and trust. Also, three other moderating variables, income, residence and age of the respondents are considered to see their controlling effect on the e-commerce adoption behavior of the consumers.

The inclusion of **value perception** in the proposed framework is very appropriate in Bangladeshi context. Because, Bangladeshi people are not so tech savvy and not so willing to adopt any new technology at the first hand. Besides, the market is very price sensitive as well. If customers are convinced that the new technology based service is worthy of using at the expense they are paying for it, only then they may be interested in availing the service.

Also, the **perceived risk** plays a vital role in attracting consumers to use any technology based service. Because, due to lack of awareness in using new technology and also due to lack of secure infrastructure, users perceive a significant amount of risk while they think of using these services. Risk perception is also correlated with the product/service quality purchased via e-commerce platforms.

Customer service in this case is very crucial, particularly in case of adoption of internet banking and online marketplaces. As the industry experts suggested, in case of internet banking, Bangladeshi bank account holders were skeptic in adopting internet banking services initially. But good customer service can convince them to try it. Particularly, during the COVID

pandemic, banks have strengthened their customer service a lot and thus attracted a number of consumers to avail internet banking services. Also, for online marketplaces, better customer service plays a decisive role in selecting a platform for purchasing products. As in Bangladeshi context, sometimes customers do not get the desired level of service in terms of product quality and in time delivery from the online marketplaces. So, better customer service encourages customers to purchase more online and thus increases the adoption of e-commerce.

Technology familiarity also plays a pivotal role particularly in case of internet banking adoption. For example, lots of people have started using smartphones in Bangladesh recently. Almost all the smartphone users browse internet through their devices. Therefore, different mobile apps are very popular among the smartphone users. Even the people who have limited internet literacy, can use various internet based services through mobile app simply by clicking on the icons on their smartphones. Several Bangladeshi banks have introduced their own mobile banking app. These banks have already gained an upper hand in terms of their number of internet banking users compared to the banks those have not yet introduced mobile banking app. Here, the point is, people are getting familiar with app based services now-a-days, and thus attracting more consumers to use these services. Therefore, technology familiarity was included in the conceptual framework for exploring the adoption behavior of internet banking.

Finally, **trust** is also considered as an important construct to be added to the proposed framework, particularly for online marketplaces. If people can trust any online shopping site, i.e. if they believe that what he/she is ordering from that site, he/she will get exactly the same product within the specified delivery time without any damage, only then he/she will buy from that site. Industry experts opined that, trust has significant influence on adoption behavior as it is related with product quality, on time delivery and also competitive pricing of any product item

listed in the online marketplace. Hence, trust is added in the conceptual framework to examine the adoption behavior of Bangladeshi consumers.

The research used income, residence and age as moderators. The rationale behind choosing these factors is that, the industry experts suggested that there might be significant difference in usage behavior of using technology based services based on income of the users. And the presence of a clear digital divide among the rural and urban population of the country justifies the inclusion of residence as a moderating variable to examine the adoption behavior. Also, age is an important moderating variable in this framework. Because, the assumption is that, the young generation is more tech savvy and thus may be more willing to avail e-commerce than the older people of the country.

Based on the argument above, three conceptual frameworks are developed. Factors from both Technology Acceptance Model (TAM) and Technology Readiness Index (TRI) have been used to study the adoption of MFS, internet banking and online marketplace. By talking the key constructs of these two theories, the proposed conceptual frameworks address the impact and interrelations of value perception, perceived risk, ease of use, technological knowhow, customer services, trust and customer satisfaction on continuance intentions and brand attitude. The proposed conceptual framework for studying factors embracing MFS is discussed in Chapter 4, acceptance of internet banking is stated in Chapter 5 and finally adoption of online marketplace is detailed in Chapter 6 of this thesis.

3.3 Data Collection

The thesis collected data in three different phases for the three different study areas: adoption of MFS, adoption of internet banking, and adoption of Online marketplace. The following sub sections detailed the method of data collection.

3.3.1 Adoption of MFS

After developing conceptual model integrating empirically supported factors indicating adoption confirmation and continuance intentions of Mobile Financial Services, a questionnaire was developed, content validation was performed to understand the relation of the content with the construct under analysis (Hair et al., 2010). The data collection instrument was submitted to a small group of experts who analyzed and checked the suitability of the indicators selected to represent the constructs discussed.

The survey questionnaire included respondents' demographic profile such as gender, age, mobile financial service use frequency, etc. and thirty one variables indicating the value perception, risk, ease, adoption confirmation, satisfaction, continuance intention, and brand attitude. The indicator of all the variables is measured by Likert scale 1–5 where "1" indicates "strongly disagree" and "5" indicates "strongly agree". In this study, a stratified sampling method was used (Acharya et al., 2013). The questionnaire was posted in different social media group for response collection and the survey had been online for six weeks. The response rate to this study is 100 percent because the questionnaire was put forth online with mandatory field to fill up the responses and the answers of respondents are saved in the database immediately when they fill out the questionnaire.

Currently, 18 companies are giving mobile financial services across the country. At January 2018 there were 58.9 million MFS account holders. Among them 20.7 million were active users

(Bangladesh Bank, 2018). To collect a representative sample from this huge population, Simple Random Sample is an unviable option, as the profile of all the 20.7 million users is not obtainable. MFSs account holders are dispersed all over the country. Moreover, people from various professions and occupations are now using the services. So, the study planned to collect sample from each of the administrative divisions of Bangladesh by selecting respondents from the following professions using Stratified Sampling method (Acharya et. al, 2013): service holder, specialized professional, businessman, casual labor, remittance earners, students, house wives and others. A total of 317 respondents holding different professions filled out the online survey from all the eight divisions in the country.

After analyzing the data, industry experts, such as the CEO of 'bkash', the leading mobile financial service provider of the country, are consulted via depth interview to share the findings of the study and take their views and opinions.

3.3.2 Adoption of Internet Banking

Once again after developing the conceptual model integrating empirically supported factors impacting adoption of internet banking, a questionnaire was developed. In case of describing the construct, multiple choice questions and Likert Scale of 1 – 5 are used assuming 1 as strongly disagree and 5 as strongly agree (Likert, 1932). The data collection instrument was then submitted to a small group of experts, who are mid-level to senior managers of different banks, have analyzed and checked the suitability of the indicators selected to represent the constructs discussed. Then an online survey was conducted for eight weeks. The response rate to this study is also 100 percent because the questionnaire was put forth online with mandatory field to fill up the responses and the answers of respondents are saved in the database immediately when they fill out the questionnaire.

As Internet Banking users are scattered throughout the country, the study used Purposive Sampling method from each of the eight divisions in Bangladesh, spanning a myriad of professions. The research deals with those bank account holders who are able to operate their account(s) themselves and surveyed participants from all socio-economic classes, in order to make the research more comprehensive and inclusive. A total of 460 respondents are surveyed among which 366 are found to be Internet Banking users.

After analyzing the data, an FGD was conducted with the industry experts, top or upper mid-level executives from the internet banking division from five leading private commercial banks of Bangladesh (details are provided in Appendix D), to discuss the findings of the study and to take their views and opinions.

3.3.3 Adoption of Online marketplace

Once again after developing the conceptual model integrating empirically supported factors impacting adoption of Online marketplace, a questionnaire was developed. In case of describing the construct, multiple choice questions and Likert Scale of 1 – 5 are used assuming 1 as strongly disagree and 5 as strongly agree (Likert, 1932). The data collection instrument was then piloted among a small group of B2C e-commerce users to check the suitability of the indicators selected to represent the constructs discussed. Then the survey was conducted physically for eight weeks. The response rate to this study is also 100 percent and the answers of respondents are saved in the database immediately when they fill out the questionnaire.

As online marketplace users are scattered throughout the country, the study used Purposive Sampling method from each of the eight divisions in Bangladesh. A total of 351 respondents holding different professions participated in the survey.

After analyzing the data, top and mid-level executives from leading online shopping sites like Daraz, Foodpanda, KhaasFood, etc. are consulted via depth interview to discuss the findings of the study and take their views and opinions.

3.4 Data Analysis

For data analysis, Structural Equation Modeling (SEM) was used. The benefit of using SEM is that, it can establish and test several direct and indirect relationships between independent and dependent variables all at once (Hooper et al. 2008 & Hair et al., 2010). SEM is a technique for assessing a series of dependence relationships among a set of concepts or constructs represented by multiple measured variables and combined into a unified model. Malhotra and Dash (2011) suggested the sample size for SEM models having five or less constructs, each having three measure variables. As per their suggestion, the sample size should be minimum 100.

The study performed the CFA using IBM SPSS AMOS. It's a widely accepted tool to perform CFA, in order to check the reliability and validity of a conceptual model (Thompson, 2004) and reject the measurement theory. CFA is a multivariate statistical procedure, used to test how well the variables measured via the questionnaire, represents the concepts being tested.

3.5 Ethical Considerations

At the beginning of all the three online surveys, the objectives and purposes of the study are explained in details. It was clearly mentioned that participation in the survey was voluntary and any respondent was free to pull out at any stage. It was also stated that responses would be kept confidential and used for academic purposes only. The contact information of the researcher was specified so that any respondent can make any query or check for any ethical issues.

4 Chapter 4: Study on Adoption of MFS

This chapter focuses on the factors affecting the adoption of MFS . It starts with the proposed conceptual frameworks used in this thesis along with the development of hypothesis, a concise and precise description of the experimental results, their interpretation, as well as the drawn experimental conclusions. This chapter ends with the discussion on findings.

4.1 Proposed Conceptual Framework

As per the discussion in the section 3.2 of the thesis and also in light of the literature review in the Chapter 2, a conceptual framework has been developed. Factors from both Technology Acceptance Model (TAM) and Technology Readiness Index (TRI) have been used. On one hand, TAM stresses on how perceived usefulness and perceived ease of use impact the attitude toward using and, in turn, the behavioral intension to use something (Davis, 1986). On the other hand, TRI introduced optimism, innovativeness, discomfort, and insecurity as the common determinants of adoption of technology (Parasuraman, 2000).

By addressing the key constructs of these two theories, the proposed conceptual framework, shown in the figure below, addresses the impact and interrelations of value perception, perceived risk, ease of use, adoption confirmation, and customer satisfaction on continuance intentions and brand attitude. The model also used income, residence status, and use frequency of respondents as moderators to test the multi-group moderating effect on adoption, usage continuance and brand attitude.

The inclusion of value perception and perceived risk in the framework is very appropriate in Bangladeshi context. Because, Bangladeshi people are not so tech savvy and not so willing to

adopt any new technology at the first hand. Besides, the market is very price sensitive as well. If customers are convinced that the new technology based service is worthy of using at the expense they are paying for it, only then they may be interested in availing the service. Also, the risk perception plays a vital role in attracting consumers to use any technology based service. Because, due to lack of awareness in using new technology and also due to lack of secure infrastructure, users perceive a significant amount of risk while they think of using these services.

The research used income, residence and usage frequency as moderators. The rationale behind choosing these factors is that, the industry experts suggested that there might be significant difference in usage behavior of using technology based services based on income of the users. And the presence of a clear digital divide among the rural and urban population of the country justifies the inclusion of residence as a moderating variable to examine the adoption behavior.

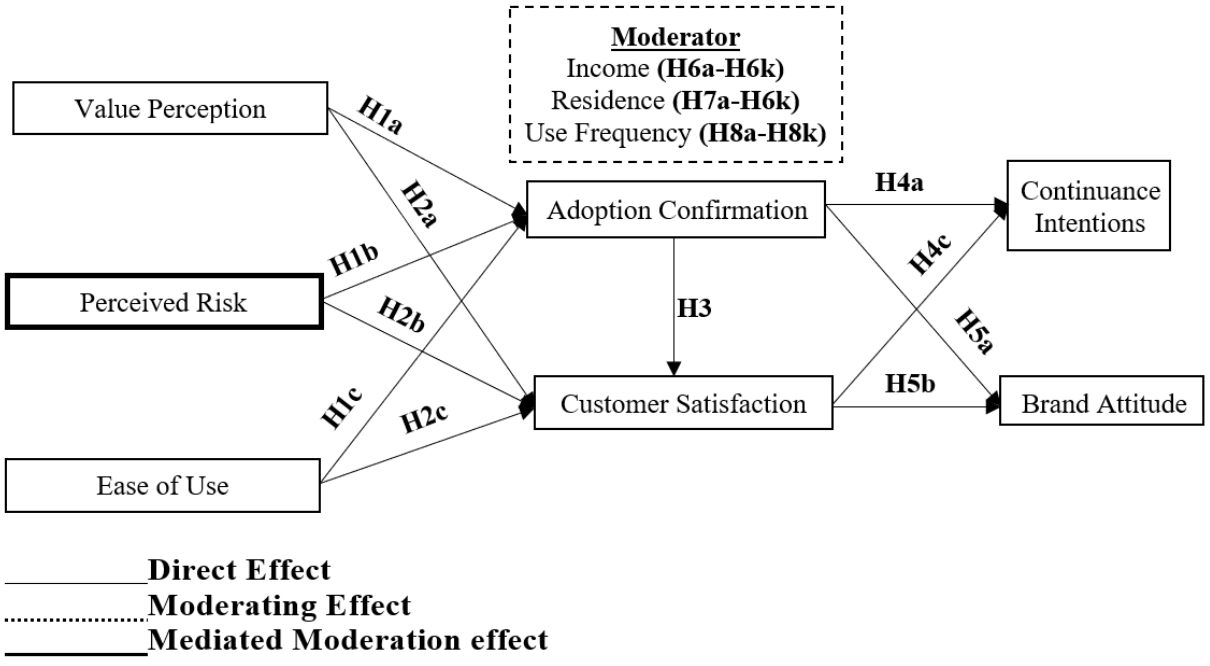


Figure 24: Conceptual Framework for analyzing adoption of MFS

Based on the research question mentioned in chapter 1, the objective of the study is set to identify and examine the aspects that affect the adoption of MFS. For this, the following hypothesis are developed for analyzing the adoption of MFS.

Direct Effects drivers and inhibitors of MFS:

H1: Adoption Confirmation of Mobile Financial Services is-

(a) positively impacted by value perception.

(b) negatively impacted by perceived risk.

(c) positively impacted by ease of use.

H2: Customer Satisfaction of Mobile Financial Services is-

(a) positively impacted by value perception.

(b) negatively impacted by perceived risk.

(c) positively impacted by ease of use.

H3: Adoption confirmation of Mobile Financial Services has a positive effect on customer satisfaction

H4: Continuance Intention of Mobile Financial services is dependent on-

(a) adoption confirmation

(b) Customer satisfaction

H5: Brand attitude towards Mobile Financial services is influenced by-

(a) adoption confirmation

(b) Customer satisfaction

Multi-group moderating effect of income, residence status, and use frequency of respondents:

Hypothesis: The (Nature of effect) relationship between (Path) is significantly different for Low (Multi-group Moderators) and High (Multi-group Moderators)

Table 7: List of Hypothesis for multi-group moderating effects of income, residence, and use frequency

Path (Direct Relationship)			Nature of effect	Multi-group Moderators		
				Income	*Residence*	*Use Frequency*
Adoption Confirmation	<---	Value Perception	Positive	H6 (a)	H7 (a)	H8 (a)
Adoption Confirmation	<---	Perceived Risk	Negative	H6 (b)	H7 (b)	H8 (b)
Adoption Confirmation	<---	Ease of Use	Positive	H6 (c)	H7 (c)	H8 (c)
Customer Satisfaction	<---	Value Perception	Positive	H6 (d)	H7 (d)	H8 (d)
Customer Satisfaction	<---	Perceived Risk	Negative	H6 (e)	H7 (e)	H8 (e)
Customer Satisfaction	<---	Ease of Use	Positive	H6 (f)	H7 (f)	H8 (f)
Customer Satisfaction	<---	Adoption Confirmation	Positive	H6 (g)	H7 (g)	H8 (g)
Continuance	<---	Adoption Confirmation	Positive	H6 (h)	H7 (h)	H8 (h)
Continuance	<---	Customer Satisfaction	Positive	H6 (i)	H7 (i)	H8 (i)
Brand Attitude	<---	Adoption Confirmation	Positive	H6 (j)	H7 (j)	H8 (j)
Brand Attitude	<---	Customer Satisfaction	Positive	H6 (k)	H7 (k)	H8 (k)

MEDIATED MODERATION EFFECT OF PERCEIVED RISK ON MFS:

H9: Perceived Risk dampens the positive relationship of -

(a) value perception and adoption confirmation.

(b) value perception and customer satisfaction.

(c) customer satisfaction and continuance intentions of MFS.

(d) customer satisfaction and brand attitude towards MFS.

4.2 Respondents' Profile

Table 8 below shows respondents' profile of the study. Initially 330 samples are collected among which 317 are valid and usable. 124 (39.1%) females and 193 (60.90%) males participated in the survey; 134 (42.3%) are between 21 – 30 years old and 129 (40.7%) are between 31 – 40 years old, a cumulative 83%. Majority of the respondent have education level above HSC (a cumulative 84.90%), with the highest proportion having a Bachelor degree (34.10%). A total of 68.50% of the respondents have MFS usage experience for at least once in a week. Monthly family income varied from BDT 10,000 to BDT.60,000, comprising 67% of the respondents. However, a significant 19.60% (62) have income level below BDT 5,000, representing low income group. One hundred seventy six respondents (55.5%) are employed in formal service sector. Furthermore, the study is composed of respondents from all the eight divisions of Bangladesh, majority of them coming from Dhaka, Rajshahi, Khulna, and Barishal divisions (a cumulative 95.50%).

Table 8: Demographic Profile of the Respondents (adoption of MFS)

Demographics		Male	Female	Total
Age Groups (in years)	<20 Years	0	6	6 (1.90%)
	21 - 30 years	80	54	134 (42.30%)
	31 - 40 Years	80	49	129 (40.70%)
	41 - 50 Years	23	14	37 (11.70%)
	51 - 60 Years	10	1	11 (3.50%)
Total		**193 (60.90%)**	**124 (39.10%)**	**317 (100%)**
Education	Primary	6	7	13 (4.10%)
	SSC	22	13	35 (11.00%)
	HSC	35	28	63 (19.90%)
	Bachelor Degree	73	35	108 (34.10%)
	Master's Degree	57	41	98 (30.90%)
Total		**193 (60.90%)**	**124 (39.10%)**	**317 (100%)**
Frequency of Using Mobile Financial Services (MFS)	Seldom	35	12	47 (14.80%)
	Monthly	23	30	53 (16.70%)
	Once in two weeks	49	16	65 (20.50%)
	Once in a week	55	48	103 (32.50%)
	Thrice in a week	22	10	32 (10.10%)
	Daily	9	8	17 (5.40%)
Total		**193 (60.90%)**	**124 (39.10%)**	**317 (100%)**

Demographics		Male	Female	Total
Region	Dhaka	48	32	80 (25.2%)
	Chattogram	3	0	3 (0.9%)
	Rsjshahi	11	32	43 (13.5%)
	Khulna	28	24	52 (16.4%)
	Barishal	95	33	128 (40.4%)
	Sylhet	2	0	2 (0.6%)
	Rangpur	2	2	4 (1.3%)
	Mymensingh	4	1	5 (1.6%)
Total		**193 (60.90%)**	**124 (39.10%)**	**317 (100%)**
Income Level	Below 5,000 Tk	21	41	62 (19.6%)
	5,001-10,000 Tk	4	18	22 (6.9%)
	10,001-20,000 Tk	17	19	36 (11.4%)
	20,001-40,000 Tk	62	26	88 (27.8%)
	40,001-60,000 Tk	68	20	88 (27.8%)
	60,001-1,00,000 Tk	17	0	17 (5.4%)
	Above 1,00,000 Tk	4	0	4 (1.3%)
Total		**193 (60.90%)**	**124 (39.10%)**	**317 (100%)**
Occupation	Service Holder	130	46	176 (55.5%)
	Specialized Professional	7	2	9 (2.8%)
	Businessman	18	4	22 (6.9%)
	Retired	6	6	12 (3.8%)
	Housewife	1	23	24 (7.6%)
	Student	17	22	39 (12.3%)
	Casual Laborer	10	18	28 (8.9%)
	Remittance Earners	3	0	3 (0.9%)
	Others	1	3	4 (1.3%)
Total		**193 (60.90%)**	**124 (39.10%)**	**317 (100%)**

Majority of the respondents (82%) are the subscribers of BKash mobile financial service provider of BRAC Bank Limited. About 46% of the respondents also use Rocket, a mobile financial service of DBBL and 16% use MFS of other Banks.

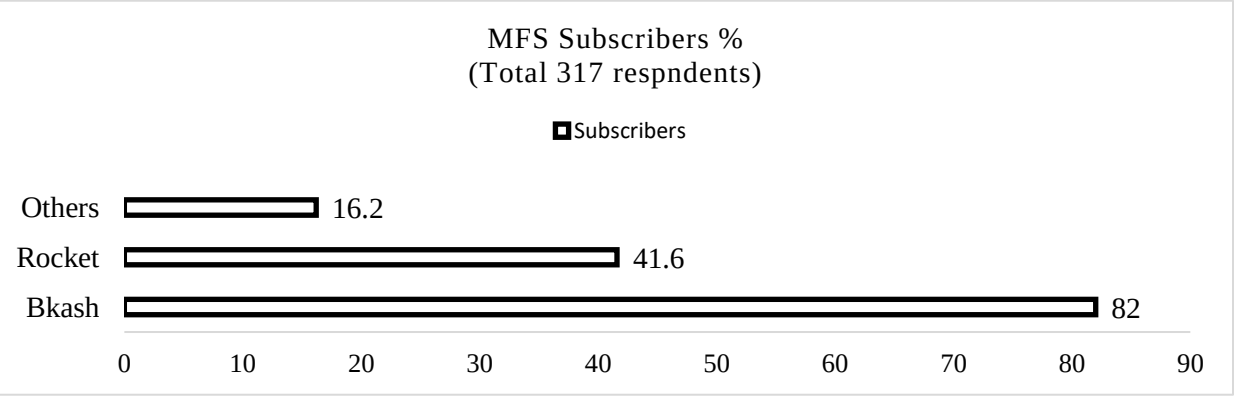


Figure 25: Subscribers of MFS among the respondents

4.3 Evaluation of the Measurement Model

At first sample adequacy test is conducted using Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy. As shown in as shown in Table 9, has achieved threshold value against the sample size.

Table 9: Sampling Adequacy of the model for adoption of MFS

KMO and Bartlett's Test	**Value**	**Threshold**
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	**.766***	**Middling****
***** *Bartlett's Test of Sphericity is Significant. (P value .000)*		
** *Results of KMO (*Cerny & Kaiser, 1977)		

To validate a reflective measurement model, it is necessary to understand confirmatory factor analysis i.e internal consistency (Cornbach's alpha, Composite Reliability), convergent validity (Factor loadings, and average variance extracted), and discriminant validity (Hair et al. 2016)**.**

CONFIRMATORY FACTOR ANALYSIS (CFA):

To assess the reliability and validity of the proposed measurement model, confirmatory factor analysis (CFA) is conducted (Thompson.B, 2004), using AMOS Version 24 software. CFA is a special form of factor analysis, used to *test* a proposed theory (CFA is a form of structural equation modeling), or model and *in contrast to Exploratory Factor Analysis (EFA),* has assumptions and expectations based on priori theory regarding the number of factors, and which factor theories or models best fit (Schreiber et al., 2006). The study considered the constructs such as, Perceived Value, Perceived Ease of Use, Continuance Intention, Customer Satisfaction, Perceived Risk, Adoption Confirmation, and Brand Attitude. The list of constructs is detailed in Table C1 in appendix.

The measurement model in Figure 26 demonstrations the assessment of each items with standardized regression weights and covariance among factors in CFA. The results of various fit indices (Shown in Table 10) of CFA model confirmed that all the indices achieved their cutoff points. So, it can be concluded that the data fit the hypothesized measurement model. Besides, to evaluate the measurement model, convergent reliability and the discriminant validity need to be checked (Hair et al., 2016).

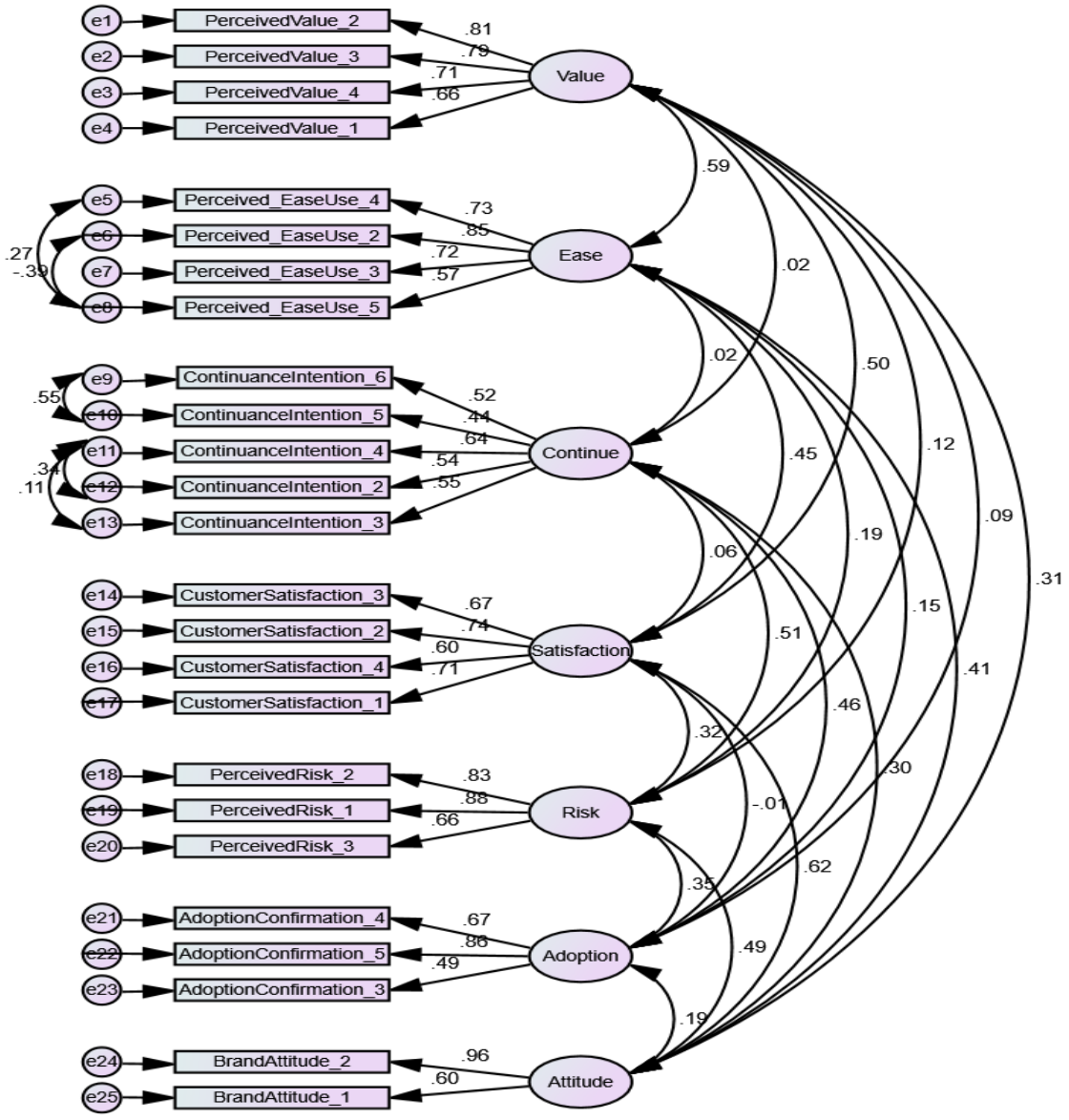


Figure 26: CFA Estimation with Standardized Regression Weights and Covariance (adoption of MFS)

The following table shows the results of various fit indices of CFA model to confirm that all the indices attained their cutoff points.

Table 10: Fit Indices of Confirmatory Factor Analysis (CFA) for adoption of MFS

Fit Indices	$\chi 2$*	P Value	AGFI	CFI	RMSEA
Obtained Value	126.155	.086	.816	.926	**.068**
Threshold Value **		***> .05***	***> .80***	***> .90***	***≤ .08***
Chi - Square* $H_0 = The\ data\ fit\ in\ hypothesized\ measurement\ model.$					

Source: Handbook of SEM (West. Et al, 2012), Cornell Statistical Consulting Unit, Cornell Johnson University

CONVERGENT VALIDITY AND RELIABILITY:

Internal consistency reliability of the measurement items is tested via Cronbach's alpha and all variables are higher than 0.70 (shown in Table A1 in Appendix). The composite reliability (CR) varies between 0 and 1, with higher values indicating higher levels of reliability. CR values between 0.70 and 0.90 can be regarded as satisfactory. Values above 0.95 are not desirable, because they indicate that all variables are measuring the same phenomenon (Hair et al., 2016). In this analysis, all values for CR are equal or below 0.95.

Items that are indicators (measures) of a specific reflective construct should converge or share a high proportion of variance (Hair et al., 2016). Convergent validity is verified by examining the factor item loadings (standardized loadings) to ensure that all variables are above 0.40, with 250 < sample size < 350; and that all values of average variance extracted (AVE) are higher than 0.50 (Malhotra and Dash, 2011; Hair Jr. et al. 2016) (shown in Tables A1 and A2 in Appendix).

Although the factors-Customer Satisfaction, Adoption Confirmation, and Continuance Intention did not achieve threshold value of AVE, they achieved MSV threshold value (shown in Table A2). Six items from these five factors are excluded from the study either due to low communalities or cross loading in factor analysis. Overall, the results showed that convergent validity is achieved and that all measurement items well represented the respective variables.

DISCRIMINANT VALIDITY:

Discriminant validity is the extent to which a construct is truly distinct from other constructs by empirical standards (Hair et al., 2016). The comparison of the constructs in sharing variance (squared correlation) is performed by discriminant validity through the AVE of each construct (Fornell and Larcker, 1981). Table A1 shows that the square roots of the AVE (bold) are all higher and distant from the diagonal correlation values, meaning that there is adequate discriminant validity. Moreover, Values for MSV are also satisfactory. Therefore, the results are acceptable and there are no issues of discriminant validity of the items in the model (Farrell, A. M. 2010), leading us to reasonably conclude construct validity and reliability of these items.

4.4 Hypothesis testing

First, the drivers and inhibitors that have direct effect on adoption of MFS are analyzed. Then the moderating effect of Income, Residence, and Use frequency of MFS is checked and finally, the mediated moderating Effect of perceived risk is analyzed.

DIRECT EFFECTS DRIVERS AND INHIBITORS OF MFS:

The structural equation model (SEM) tested the hypothesized relationship between the constructs. Table 11 below shows that Perceived Risk has a negative effect on Adoption Confirmation of mobile financial services. The estimated paths are statistically significant at

0.001 level (ß = 0.269, p= 0.000 < 0.001). Furthermore, Value Perception, Ease of Use, Perceived Risk have all direct impact in determining Customer Satisfaction in Mobile Financial Services (MFS), the results are statistically significant at 0.01 level (p= 0.000 < 0.001) with ß =0.239, 0.280, and 0.238 respectively. Although Adoption Confirmation does not guarantee Customer Satisfaction, it has a direct positive impact on Continuance Intentions of MFS, the result is statistically significant at 0.01 level (p= 0.000 < 0.001) with ß =0.275. Moreover, both Customer Satisfaction and Adoption Confirmation have direct positive impact towards Brand Attitude of mobile financial services. The estimated paths are also statistically significant at 0.001 level (p= 0.000 < 0.001) with ß = 0.850 and 0.203 respectively. Therefore, these findings support our hypothesis H1b, H2a-c, H4a, and H5a-b.

The coefficient of determination (R^2 value) represents a measure of in-sample predictive power (Sarstedt and Mooi, 2014). R^2 values within the range of 0.07 and 0.15 are considered high in disciplines such as consumer behavior (Hair et al., 2016). In this analysis, R^2 presented value of 0.08 in case of Adoption Confirmation; this means that 8.00% of Adoption Confirmation in MFS is explained by Value Perception, Perceived Risk, and Ease of Use. A similar R^2 result is also found in case of Continuance Intention and Brand Attitude towards MFS, meaning Adoption Confirmation and satisfaction of subscribers of MFS explained 8.00% of Continuance Intentions and Brand Attitude. However, a significant R^2 value of 0.28 is found in case of Customer Satisfaction, a result that indicates that Perceived Value, Ease of Use, Risk explain maximum 28% variations in Customer Satisfaction than any other factor.

Table 11: Path Estimates of SEM with no Moderating Effect for adoption of MFS

Path			β Estimate	S.E.	C.R.	P Value	R^2	Hypothesis	Result
Adoption Confirmation	<---	Value Perception	.079	.046	1.279	.201	**.08**	H1a	Not Supported
Adoption Confirmation	<---	Perceived Risk	.269	.034	4.878	***		H1b	**Supported**

Path			β Estimate	S.E.	C.R.	P Value	R^2	Hypothesis	Result
Adoption Confirmation	<---	Ease of Use	-.027	.050	-.427	.670		H1c	Not Supported
Customer Satisfaction	<---	Value Perception	.238	.046	4.878	***	**.28**	H2a	**Supported**
Customer Satisfaction	<---	Perceived Risk	.280	.036	6.099	***		H2b	**Supported**
Customer Satisfaction	<---	Ease of Use	.239	.050	4.833	***		H2c	**Supported**
Customer Satisfaction	<---	Adoption Confirmation	-.149	.063	-3.003	.003		H3	Not Supported
Continuance	<---	Adoption Confirmation	.275	.071	5.093	***	**.08**	H4a	**Supported**
Continuance	<---	Customer Satisfaction	-.031	.056	-.575	.566		H4b	Not Supported
Brand Attitude	<---	Adoption Confirmation	.203	.076	3.750	***	**.08**	H5a	**Supported**
Brand Attitude	<---	Customer Satisfaction	.850	.114	8.294	***		H5b	**Supported**

******P <.001, S.E = Standard Error, C.R = Critical Ratio, and β = Regression Coefficient, R^2 = R squared***

WITH MODERATING EFFECT OF INCOME, RESIDENCE, AND USE FREQUENCY OF RESPONDENTS:

The moderating effect of Income, Residence, and Use frequency of MFS is checked by splitting the sample into two groups, with Low income (208 respondent) vs. high income (109 respondent), Rural residence (202 respondent) vs. urban residence (115 respondent), and Low frequency (165 respondent) vs. High frequency (152 respondent) respectively. This is tested by running analyses in IBM SPSS AMOS to observe "standardized" group differences. The z-score is a statistical transformation that specifies how far a particular value lies from the mean of a normal distribution in terms of standard deviations, z-scores are particularly helpful in comparing observations that come from different group and from distributions with different means, standard deviations, or both.

Respondents are categorized in above groups based on median score of income (below BDT 20,000 as low income group), residence (rural and urban), and use frequency (No use of MFS in a week as less frequent users). Table 5 presents all indexes. The moderating effect (Sobel, 1982)

for income, residence, and use frequency, is seen when the *Z* – value for the difference between groups is significant, $p < 0.001$, $p < 0.05$, and $p < 0.10$, meaning that there is an indirect effect of moderators. Table 12 shows that Perceived Risk and Ease of Use did not present significant differences associated with Adoption Confirmation for all the groups. Moreover, Value Perception also showed similar results.

However, both Perceived Risk and Ease of Use did present significant differences associated with Customer Satisfaction low-income group and high-income group. Similar results are also observed in the effect of Adoption Confirmation on Customer Satisfaction for both income group and residence group. Additionally, the impact of Customer Satisfaction on Brand Attitude has significant group differences with regards to income, residence, and use frequency. These findings support our hypothesis presented in Table 12.

Table 12: Path Estimates of SEM with Moderating Effect for adoption of MFS

Path			*Z Score for Moderators*			Direct Effect Result (From Table – 7)	Moderating Effect Result	Hypothesis Supported
			Income	Residence	Use Frequency			
Adoption Confirmation	<---	Value Perception	0.308	-0.405	1.84*	Not Supported	Use Frequency	H8(c)
Adoption Confirmation	<---	Perceived Risk	1.001	-0.313	-0.300	Supported	No effect	--
Adoption Confirmation	<---	Ease of Use	-0.851	0.247	-0.007	Not Supported	No effect	--
Customer Satisfaction	<---	Value Perception	-0.848	-1.167	-0.109	Supported	No effect	--
Customer Satisfaction	<---	Perceived Risk	-3.699***	-0.663	-0.033	Supported	Income level	H6(e)
Customer Satisfaction	<---	Ease of Use	3.899***	0.441	1.082	Supported	Income level	H6(f)
Customer Satisfaction	<---	Adoption Confirmation	2.744***	3.58***	0.422	Not Supported	Income & Residence	H6(g) & H7(g)
Continuance	<---	Adoption Confirmation	2.946***	-0.769	0.128	Supported	Income level	H6(h)
Continuance	<---	Customer Satisfaction	1.913*	-0.830	1.223	Not Supported	Income level	H6(i)
Brand Attitude	<---	Adoption Confirmation	2.178**	0.391	-3.206***	Supported	Income & Use Frequency	H6(j) and H8(j)
Brand Attitude	<---	Customer Satisfaction	5.731***	-3.254***	1.672*	Supported	Income, Residence, &	H6(k), H7(k), and H8 (k)

Path			*Z Score for Moderators*			Direct Effect Result (From Table – 7)	Moderating Effect Result	Hypothesis Supported
			Income	Residence	Use Frequency		Use Frequency	
***P <.001, **P <.05, *P <.10, Z Score*								

WITH MEDIATED MODERATING EFFECT OF PERCEIVED RISK:

To examine the mediated moderating hypothesis, a Baron and Kenny moderation analysis (Hayes, 2009) is conducted to assess if moderator moderates the relationship between independent variable and dependent variable. The independent variables of the regression in SEM are independent variable, moderator, and the interaction between independent variable and moderator. The interaction is created by multiplying standardized values of independent variable and moderator together after both have been centered to have a mean of 0. The dependent variable of the regression is dependent variable. If the interaction is significant, then moderation is supported.

Results from mediated moderation testing show that, Perceived Risk significantly moderates (dampens) the relationship between Value Perception and Adoption Confirmation (ß = .250, p <.01) and Customer Satisfaction (ß = .227, p <.01); whereas Perceived Risk doesn't significantly moderate the relationship between Customer Satisfaction and Continuance Intentions (ß = -.006, p = .322).

However, Perceived Risk does moderate (dampen) the relationship between Customer Satisfaction and Brand Attitude (ß = .242, p <.01).

These findings, which are also consistent with Aiken and West (1991), are depicted in Figures 27 to 30. Overall, these results partially support H4a, H4b, and H4d.

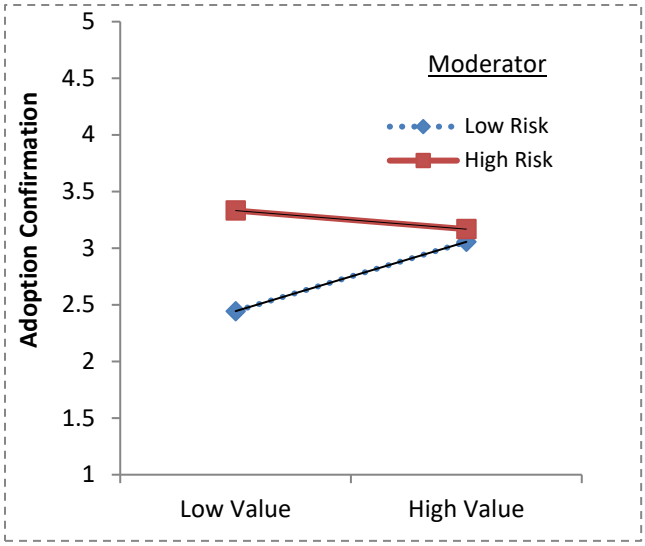


Figure 27: Impact of Value perception on Adoption Confirmation of MFS

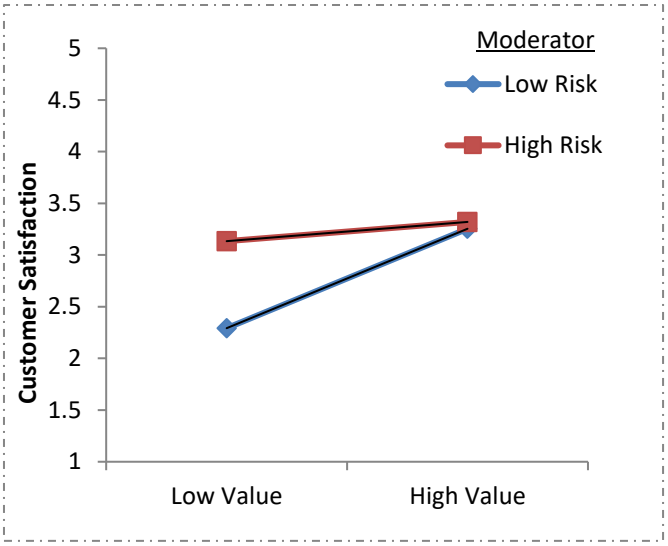


Figure 28: Impact of Value Perception on Customer Satisfaction of MFS

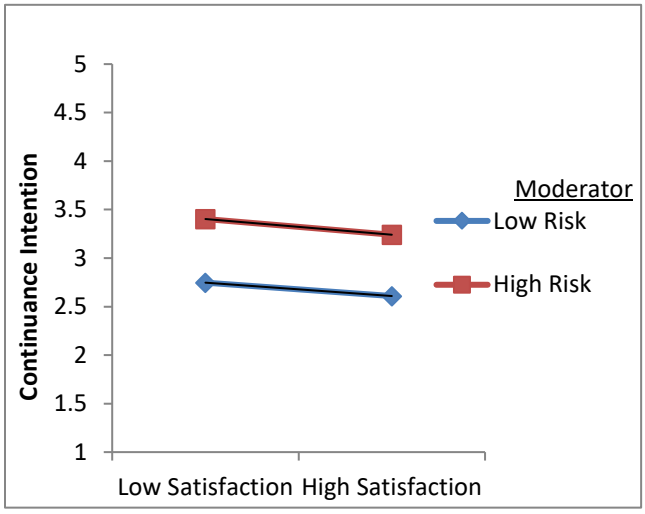


Figure 29: Impact of Customer Satisfaction on Continuance Intention of MFS

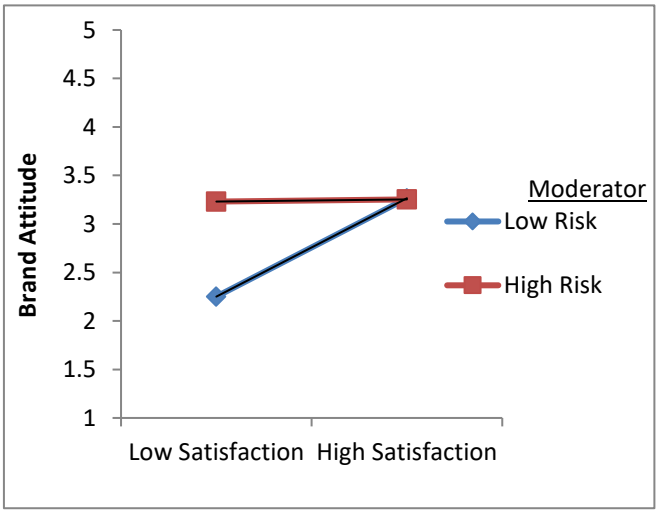


Figure 30: Impact of Customer Satisfaction on Positive Brand Attitude towards MFS

4.5 Discussion on findings

This section provides the critical analysis and discussion of the implementation of the proposed model in the specific context of Bangladesh and the outcome of the survey response. To begin the section, it is split into two different parts. One is the analysis of the factors and discussion on the survey findings and second is the comparison the findings with similar studies.

4.5.1 Analysis of findings

While studying the adoption of MFS, the demographic profile of the respondents shows that the research is made of sample from each of the divisions of Bangladesh taking survey participants from each of the following occupations using Stratified Sampling method: service holder, specialized professional, businessman, casual labor, remittance earners, students, house wives and others. Thus, the study maintained sample diversity in line with the desires of the researchers and requirement of the thesis.

Test of Hypothesis results from direct effects of drivers and inhibitors of Adoption Confirmation and Continuance Intentions indicated that all the drivers and inhibitor, i.e., Perceived Risk, Perceived Ease of Use, and Value Perception lead to users' satisfaction of MFS. This result is also statistically significant in case moderating effect of income. From the direct effect of Adoption Confirmation and users' satisfaction on forming positive Brand Attitude, Customer Satisfaction exerted strong influence. This finding is also statistically significant with the moderating effect of income, residence, and use frequency of MFS.

Results from mediated moderating effect revealed that Perceived Risk dampens the positive effect of users' Value Perception of MFS on Adoption Confirmation of MFS (Figure 27). This illustrate when Perceived Risk of using MFS is low, there is positive relationship between Value Perception of MFS and its Adoption Confirmation. On the other hand, when Perceived Risk of

such service is high, there is negative relationship between Value Perception and Adoption Confirmation of such service. This observation also holds true for the positive effect of Value Perception on Customer Satisfaction of MFS (Figure 28) and the positive effect of Customer Satisfaction on positive Brand Attitude towards MFS (Figure 30), with the mediated moderating effect of Perceived Risk of such services. However, Perceived Risk doesn't have any mediated moderating effect on the positive relationship between Customer Satisfaction and Continuance Intentions of MFS (Figure 29), indicating that users' Perceived Risk of MFS remains constant in perspective of their satisfaction level and its subsequent impact on Continuance Intentions. This implies that users' low satisfaction level not influenced solely due to their Perceived Risk but may be due to other factors.

Based on the research question mentioned in section 1.3, the objective of the study is to identify and examine the aspects that affect the adoption of MFS. From the above discussion on findings it is clear that the thesis has achieved that goal. As per the results of hypothesis testing, the aspects that affect the adoption of MFS most are perceived risk, ease of use and value perception.

4.5.2 Comparison of findings

The findings of the thesis are compared with some alike researches. The findings are equated in terms of

- the relationship among the different constructs used in the models,
- influence of different constructs on adoption confirmation, and
- moderating effect of different moderators on adoption and satisfaction.

In light of that, the thesis findings are consistent with the findings of Chakraborty & Bhat (2018). They found that there is a positive relationship between adoption confirmation and positive brand attitude. Case wise, this thesis investigated the findings with the moderating effect of

income, residence status, and use frequency of users of MFS. The result that value perception, perceived risk, and ease of use has impact on determining customer satisfaction, that continuance intentions of MFS is influenced by adoption confirmation and customer satisfaction, and that positive brand attitude towards MFS is dependent on adoption confirmation and customer satisfaction, showed significant differences with the moderating effect of different income group. Moreover, the result that positive brand attitude towards MFS is dependent on adoption confirmation and customer satisfaction has shown significant differences in terms of users' use frequency of MFS and resident status. This empirical result is also in line with the finding of Park, et al., (2007). However, in mediated moderating effect, we observed that these relationships among adoption confirmation, customer satisfaction, continuance intentions, and positive brand attitude towards mobile financial services (MFS) are all nullified, if user perceived risk of such services is negative.

The findings of the thesis are compared with some similar researches in the context of Bangladesh. For example, Himel et al. (2021) conducted research on users' attitudes and behavioral intention to adopt MFS from a Bangladeshi context. Data were collected from 196 respondents and analyzed using partial least squares (PLS) modeling. Snowball sampling technique is used to collect the data for this research and most data were collected from Dhaka and Chattogram. Furthermore, an FGD is conducted to validate findings from the quantitative analysis. Both Technology Acceptance Model (TAM) and Innovation Resistance Theory (IRT) were used in the research. The authors found that perceived usefulness (PU), perceived ease of use (PEOU) and perceived trust (PT) positively contribute to customers' attitudes toward MFS adoption. The study used a non-probability sampling method, snowball sampling with a relatively small sample size. Usually, snowballing is done in case of situation where the

respondents are rare in population. This is a major limitation of the study. But the sample of this thesis is more diversified and representative, which increases the legitimacy of the findings. Also, this thesis examines the moderating effect of parameters like age, usage frequency and residence, which are context specific for Bangladesh, to see further analyze the adoption behavior of the consumers.

Khalid & Gani (2021) studied the MFS adoption behavior in Bangladesh using an adapted TAM and applying randomized conjoint experiment. They tried to examine a causal relationship between attributes (ease of use, social influence, distance, cost and trust) and adoption behavior. They collected 240 responses from two districts of Bangladesh, Chattogram and Noakhali. The study found that adoption behavior is significantly impacted by distance and cost per transaction. The study also found, ease of use has a moderately significant influence on customer's adoption behavior and social influence and trust have no significant influence. But the findings of this study are not representative as data were collected only from two districts of Bangladesh.

Hassan et al. (2022) identified the drivers influencing the adoption intention towards MFS in an emerging market like Bangladesh. The study used Structural Equation Modeling (SEM) using `perceived benefit, and facilitating conditions on the adoption intention towards MFS have a positive impact. Stress was given on achieving customer satisfaction to lead customers to more digital transactions after adoption. The study was cross-sectional and quantitative in nature and only collected data from the MFS users of Dhaka city. Both UTAUT and EVF models were used in this research. Although there are similarities in the research design and methodology with this paper, the collection of data in this thesis is more diverse and representative than Hasan et al. (2022). Additionally, the impact of moderators has been analyzed in this thesis as well, which has provided important insights.

5 Chapter 5: Study on Adoption of Internet Banking

This chapter focuses on the factors affecting the adoption of internet banking . It starts with the proposed conceptual frameworks used in this thesis along with the development of hypothesis, a concise and precise description of the experimental results, their interpretation, as well as the drawn experimental conclusions. This chapter ends with the discussion on findings.

5.1 Proposed Conceptual Framework

Based on the discussion in the section 3.2 of the thesis and also in light of the literature review in the Chapter 2, a conceptual framework has been developed. The drivers and inhibitors inspired the creation of a hybrid version of the Technology Adoption Model or TAM and TRI models. TAM points at the causality between the perceived usefulness of an action or work, as well as the ease of use and the attitude and actual user adoption behavior (Davis et al. 1989). Technology Readiness Index or TRI (Parasuraman, 2000) talks about four factors: Optimism-the degree to which people have a positive view of technology, Innovativeness-the degree to which people are technological pioneers, Discomfort-the degree to which people perceive a lack of control and are overwhelmed by technology and lastly, insecurity: the degree to which people distrust technology and its ability to solve or ease banking needs.

Anticipating impact from these key constructs the proposed framework considers the effect of the perceived value, ease of use, risk and technological knowhow with customer satisfaction, adoption and ultimately the continuance of use as shown in the following figure. The model also used income, age, and usage frequency of respondents as moderators to test the multi-group moderating effect on adoption, customer satisfaction and usage continuance.

As discussed in section 4.1, the inclusion of value perception and perceived risk in the proposed framework is of ample importance in the context of Bangladesh. Here two new constructs, customer service and technology familiarity, is included in the proposed model to examine the adoption behavior of internet banking. Customer service in this case is very crucial. As the industry experts suggested, Bangladeshi bank account holders are skeptic in adopting internet banking services initially. But good customer service can convince them to try it. Particularly, during the COVID pandemic, banks have strengthened their customer service a lot and thus attracted a number of consumers to avail internet banking services.

Technology familiarity also plays a pivotal role particularly in case of internet banking adoption. For example, lots of people have started using smartphones in Bangladesh recently. Almost all the smartphone users browse internet through their devices. Therefore, different mobile apps are very popular among the smartphone users. Even the people who have limited internet literacy, can use various internet based services through mobile app simply by clicking on the icons on their smartphones. Several Bangladeshi banks have introduced their own mobile banking app. These banks have already gained an upper hand in terms of their number of internet banking users compared to the banks those have not yet introduced mobile banking app. Here, the point is, people are getting familiar with app based services now-a-days, and thus attracting more consumers to use these services. Therefore, technology familiarity is included in the conceptual framework for exploring the adoption behavior of internet banking.

Also, age is introduced as a moderating variable in this framework. Because, the assumption is that, the young generation is more tech savvy and thus may be more willing to avail internet banking services than the older people of the country.

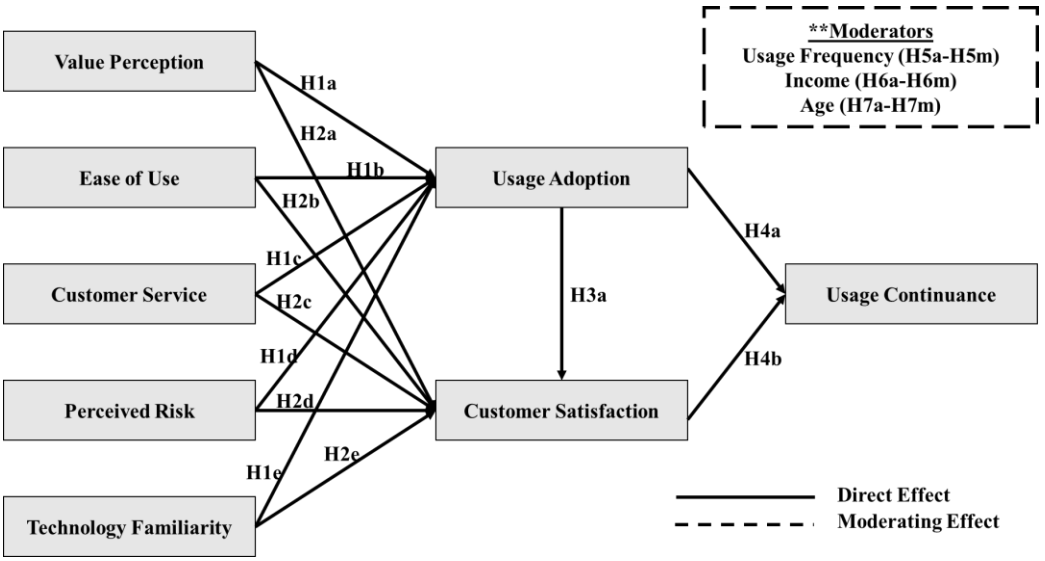


Figure 31: Conceptual Framework for analyzing internet banking

The study used appropriate statistical techniques to assess the effects of each of the constructs that have been linked in the conceptual framework.

Based on the research question stated in chapter 1, the objective of the study is set to find and scrutinize the issues that influence the acceptance of Internet Banking. For this, the following hypothesis are developed for analyzing acceptance of Internet Banking.

Table 13: Summarized Table of Hypotheses Development

Construct Name		Impacted (+/-) By
Usage Adoption	H1	a) (+) Value Perception b) (+) Ease of Use c) (+) Customer Service d) (-) Perceived Risk e) (+) Technology Familiarity
Customer Satisfaction	H2	a) (+) Value Perception b) (+) Ease of Use c) (-) Perceived Risk d) (+) Customer Service e) (+) Technology Familiarity
	H3	a) (+) Usage Adoption
Usage Continuance	H4	a) (+) Usage Intention b) (+) Customer Satisfaction

To reiterate the strength of the framework, three moderating factors are incorporated: Usage Frequency, Income and Age. This will allow better understanding of the extent these moderating variables change the nature of the respective relationships between the hypothesized predictors and outcomes.

Table 14: Hypotheses for Multi-Group Moderators: Usage Frequency, Income and Age

Path Relationship			Effect (+/-)	Multi-group Moderators		
				Usage Frequency (H5)	Income (H6)	Age (H7)
Usage Adoption	←	Value Perception	+	a	a	a
	←	Ease of Use	+	b	b	b
	←	Customer Service	+	c	c	c
	←	Perceived Risk	-	d	d	d
	←	Technology Familiarity	+	e	e	e
Customer Satisfaction	←	Value Perception	+	f	f	f
	←	Ease of Use	+	g	g	g
	←	Customer Service	+	h	h	h
	←	Perceived Risk	-	i	i	i
	←	Technology Familiarity	+	j	j	j
	←	Usage Adoption	+	k	k	k
Usage Continuance	←	Usage Adoption	+	l	l	l
	←	Customer Satisfaction	+	m	m	m

5.2 Respondents' Profile

From the total of 460 participants of the survey, 366 of them have been found to be using Internet Banking in one of the Banks. Of these 360 people who use Internet Banking, 278 of them are male and 88 of them are female. On the other hand, out of 94 people who doesn't use internet banking, 70 are male and 24 are female. Almost 24% of the respondents who have claimed to be using Internet Banking are Female while the rest 76% of the respondents are Male.

80% of the total Male respondents are using Internet Banking whereas 79% of the total Female respondents are using Internet Banking (Table 15).

Of the total 366 respondents who use Internet Banking, 28% have said that they use Internet Banking services more than 12 times a month. Only 7% of the respondents have said that they rarely use Internet Banking (once in 3-4 months). 38% (138 people) of the total respondents have said that they use Internet Banking 10 or more times a month.

Table 15: Demographic Profile of the Respondents (adoption of internet banking)

Demographic		Male	Female	Total	Percentage
Age	<25 years	71	33	104	22.61%
	26 – 35 years	149	50	199	43.26%
	36 – 45 years	82	18	100	21.74%
	46 – 55 years	17	5	22	4.78%
	>55 years	29	6	35	7.61%
	Total	348	112	460	100.00%
Income	Below 10,000 BDT	25	19	44	9.57%
	10,001 – 30,000 BDT	52	21	73	15.87%
	30,001 – 50,000 BDT	74	16	90	19.57%
	50,001 – 70,000 BDT	57	25	82	17.83%
	70, 001 – 90,000 BDT	31	11	42	9.13%
	Above 90,000 BDT	109	20	129	28.04%
	Total	348	112	460	100.00%
Occupation	Businessman	19	1	20	4.35%
	Entrepreneur	17	3	20	4.35%
	Government Service	25	3	28	6.09%
	Homemaker	0	4	4	0.87%
	Private Service Holder	202	65	267	58.04%
	Remittance Earner	4	0	4	0.87%
	Retired Personnel	19	4	23	5.00%
	Specialized Professional	20	11	31	6.74%
	Student	34	196	50	10.87%
	Unemployed	8	5	13	2.83%
	Total	348	112	460	100.00%
Education	Primary (till Class 5)	0	0	0	0.00%
	Secondary (till Class 10)	1	0	1	0.22%
	SSC/ O Levels	1	1	2	0.43%
	HSC/ A Levels	13	4	17	3.70%

Demographic		Male	Female	Total	Percentage
	Diploma	7	1	8	1.74%
	Bachelor's Degree	145	42	187	40.65%
	Master's Degree	177	64	241	52.39%
	M.Phil.	3	0	3	0.65%
	Ph.D.	1	0	1	0.22%
	Postdoc.	0	0	0	0.00%
	Total	348	112	460	100.00%
Region	Dhaka	277	107	384	83.48%
	Chattogram	22	3	25	5.43%
	Rajshahi	5	0	5	1.09%
	Khulna	3	0	3	0.65%
	Barishal	5	0	5	1.09%
	Sylhet	10	0	10	2.17%
	Rangpur	17	0	17	3.70%
	Mymensingh	9	2	11	2.39%
	Total	348	112	460	100.00%
Usage Frequency	Never	70	24	94	20.43%
	Once every 3-4 months	16	9	25	5.43%
	1-3 times	47	20	67	14.57%
	4-6 times	61	20	81	17.61%
	7-9 times	41	14	55	11.96%
	10-12 times	29	8	37	8.04%
	Over 12 times	84	17	101	21.96%
	Total	348	112	460	100.00%

5.3 Evaluation of the Measurement Model

The sample adequacy test is conducted using Kaiser-Meyer-Olkin (KMO) measures of sampling adequacy with Barlett's Test of Sphericity. The summary result of these two tests is presented in Table 16.

Table 16: Sampling Adequacy of the model for adoption of internet banking

KMO and Bartlett's Test	Value	Threshold
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	**.937***	Adequate**
* Bartlett's Test of Sphericity is Significant. (P value .000)		
** Results of KMO (Cerny & Kaiser, 1977)		

The Value of KMO is 0.937, which implies that the factor analysis is useful for the 366 internet banking users of this survey. Barlett's test shows the variance are true before running the further statistical tests. (Snedecor et al. 1989).

As mentioned earlier, it is important to validate a conceptual model. For that a confirmatory factor analysis (internal consistency, convergent validity and discriminant validity) has been conducted.

CONFIRMATORY FACTOR ANALYSIS (CFA):

In CFA is a multivariate statistical procedure used to test how well the variables, measured via the questionnaire, represents the concepts being tested. The variables are Value Perception, Ease of Use, Customer Service, Perceived Risk, Technology Familiarity, Usage Adoption, Customer Satisfaction, and Usage Continuance. These variables are detailed in Table C2 in Appendix C.

The CFA model, represented in Figure 32, shows the estimation of each of the variables tested with standardized regression weights as well as covariance among the concepts. High standardized regression weights are interpreted as high correlation between the variables. Similarly, high covariance among the various concepts translate to a high level of correlation among them. However, the study wanted the concepts to be as mutually independent as possible.

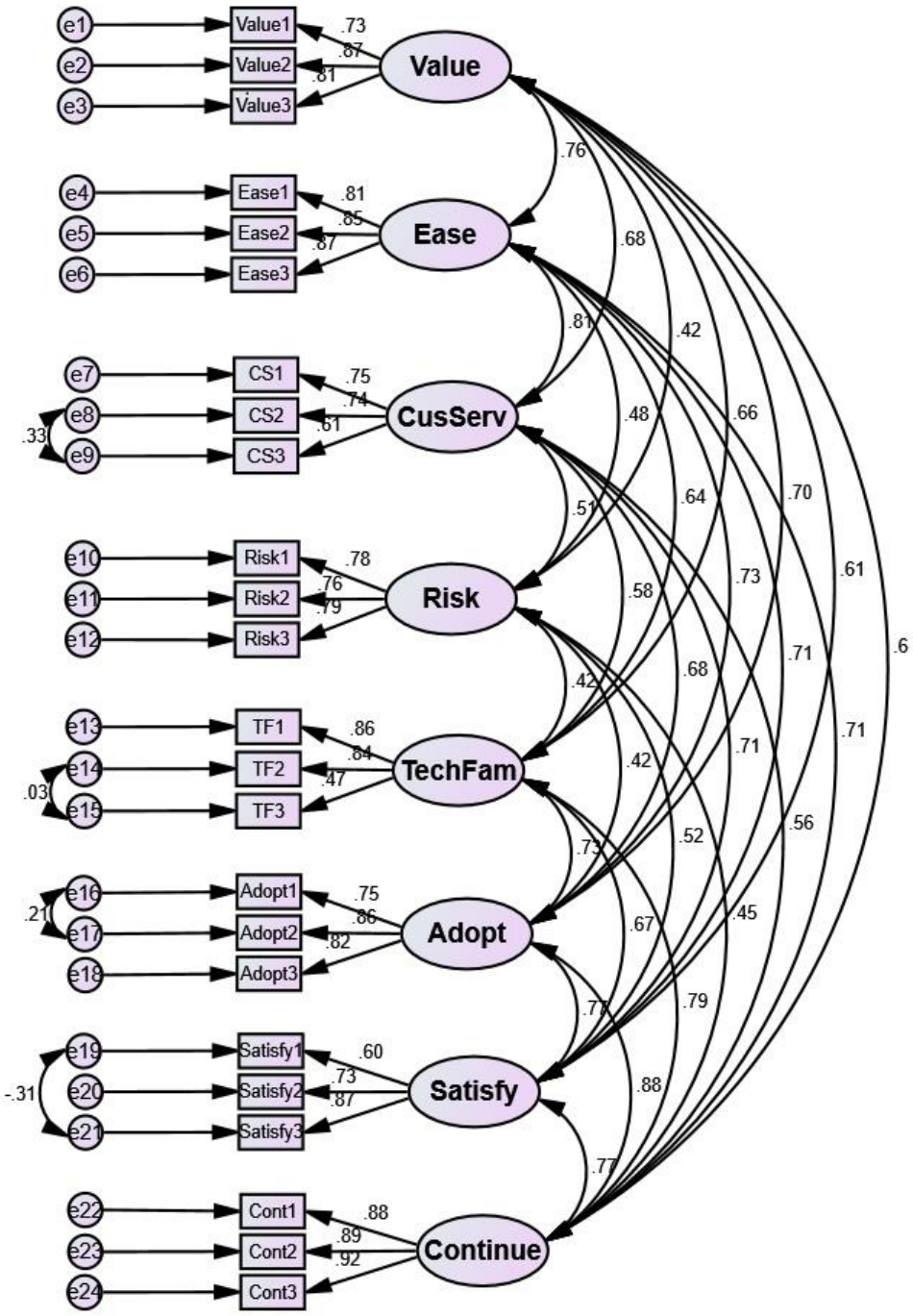


Figure 32: CFA Estimation using Standardized Regression Weights and Covariance (internet banking)

In Table 17, the fit indices of the model are given. These are all Chi-square ($\chi 2$) statistics and include: Adjusted Goodness of Fit (AGFI), Comparative Fit Index (CFI), Root Mean Square Error (RMSEA) and the Minimum Discrepancy (CMIN/df) (Maat et al., 2015). As shown in the

table below, the model meets all the respective threshold criteria and so it can be inferred that, this hypothesized model is a good enough fit.

Table 17: Fit Indices of the model, as per CFA for adoption of internet banking

Fit Indices	χ^2	P-Value	AGFI	CFI	RMSEA	CMIN/df
Obtained value	562.823	0.000	0.834	0.941	0.65	2.558
Threshold Value		< 0.05	>= 0.80	> 0.90	<= 0.08	< 5
Decision		Acceptable	Good	Good	Good	Excellent

VALIDITY AND RELIABILITY TEST:

Convergent Validity test is conducted to check the same or similar constructs, which generally have a higher correlation between them. To determine the Convergent Validity, Factor Loading (FL), Average Variance Extracted (AVE), and Maximum Shared Variance (MSV) value is generated.

Factor Loading (FL) is conducted to get the correlation coefficient for the variables and factors, as shown in Figure 32. Ideally, the value should be in between 0.4 to 0.7. This is achieved for all the constructs except for Technology Familiarity (0.267) and Customer Service (0.334) as shown in Table A3 in Appendix B.

The low value for these two constructs is most likely for the general customer's lack of keeping up-to-date with the technological trends and in case of Customer Service due to interruption in online transaction using the switches used in the country (Kite and Whitley, 2018).

Average Variance Extracted (AVE) measures the amount of variance that is captured by the construct in relation to the amount of variance due to measurement error. The rule-of-thumb for AVE is greater than 0.50 (Fornell and Larcker, 1981) which are achieved in all the constructs

except for Customer Service (0.49). It can be inferred that the lower value is due to the same problem as mentioned for lower value in Factor Loading, which is risk of transaction failing is not as low as customers' expectation (Hair et al. 2016) (Malhotra and Dash, 2011).

Discriminant Validity determines whether the variables are truly distinct from others (Hair et al. 2016). For having Convergent Validity results all permissible, the study ran discriminant validity by square rooting AVE and compared whether the value is greater than the Maximum Shared Value (MSV) (Hair et al. 2010). In the study five constructs (Value Perception, Ease of Use, Customer Service, Perceived Risk, and Usage Continuance) are found passing this criterion, indicating that the adequacy of discriminant validity as well (Fornell and Larcker, 1981) (Farrel, 2010) whereas, Technology Familiarity, Usage Adoption and Customer Satisfaction, AVE value is less than the MSV value .

Reliability indicates how consistently the test can measure the construct characteristics. To conduct Reliability test, Cronbach's alpha (α) is measured. Cronbach's alpha indicates the internal consistency by determining the close relatability of the items of the construct. General acceptable value of alpha is 0.7 to 0.8 for comparatively good level with >0.8 indicating excellent level, however >0.95 is not necessarily good (Hulin et al. 2001) (Ursachi et al., 2013). All the values are in permissible limit $0.7 < \alpha < 0.95$. Composite Reliability (CR) value is determined using the component matrix value derived for each parameter. Permissible limit of CR value is in between 0.7 to 0.95 (Hair et al. 2016) which also complements the model in Table A3 in Appendix.

5.4 Hypothesis testing

Structural Equation Modeling (SEM) suggested by Malhotra and Dash (2011) implies that with five or fewer construct with each having at least three variables, a proper model fit can be done with sample size at least 100. The study conducted Structural Equation Model (SEM) in the 366 internet banking users to analyze multiple direct and indirect relationships between independent and dependent variables simultaneously (Hooper et al., 2008; Hair et al., 2010).

Using "Data Imputation" the exogenous variables are imputed onto an SPSS data file. Using these newly created variables, the model in Figure 33 is prepared. This SEM and its derivatives are used in all of the oncoming calculations, like path analysis.

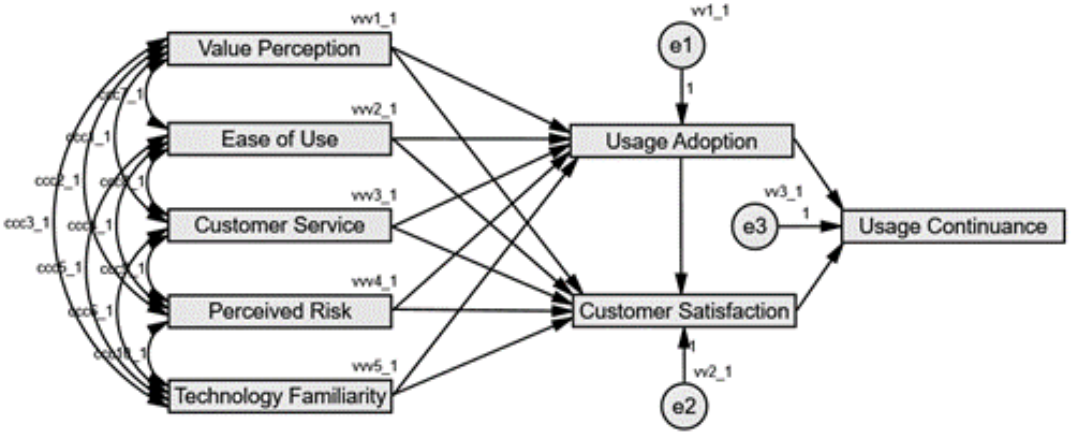


Figure 33: High Level Conversion of CFA to SEM using Data Imputation (adoption of internet banking)

SEM ANALYSIS OF THE DRIVERS AND INHIBITORS OF INTERNET BANKING ADOPTION:

The beta (β) estimate, also known as the regression coefficient is the degree to which change occurs in the dependent variable, for every 1-unit of change in the independent variable. A positive value indicates a positive change, whereas a negative value indicates a negative change. The Critical Ratio (CR) is the ratio of a respective estimate by its standard error. When CR> 1.96

for a regression weight, the estimated path parameter is significant, at 5% Significance Level (Byrne, 2013).

The coefficient of determination (R^2) shows how much the variability of one factor can be caused by its relationship with the other factor being tested. This metric presents an in-sample predictive power (Sarstedt & Mooi, 2014). A value of 0.777 means that 77.7% of Usage Adoption of Internet Banking can be explained by Value Perception, Ease of Use, Perceived Risk, Customer Service, and Technology Familiarity. The R^2 value is adjusted for predictors that are not statistically significant in the model and it's a better model evaluator than just the R^2 value.

From the hypothesis testing endeavor, the study found three hypotheses which are not supported and the rest of the thirteen are indeed supported at 5% significance level. Usage Adoption is directly and positively impacted by the Ease of Use, Customer Satisfaction, and Technology Familiarity. It's negatively impacted by the Value Perception and Perceived Risk of using Internet Banking. Customer Satisfaction on the other hand is positively impacted by Usage Adoption, Perceived Risk, Customer Service, Technology Familiarity, and Usage Adoption. Usage Continuance, as hypothesized is positively impacted by both the Usage Adoption and the Customer Satisfaction, with the highest R^2 value (~88.5%).

An interesting finding is that the hypothesized positive impact claims of Ease of Use on Customer Satisfaction is not supported, as per the calculations (with P value 0.325). This indicates that the customers that are satisfied of using Internet Banking don't really do so because of easy-to-use features. Similarly, there is statistical evidence to support that the Perceived Value and the Risk Perception in Internet Banking don't have enough impact on Usage Adoption, but has positive effect on Customer Satisfaction.

Table 18: Path Estimation using SEM without moderating effect for adoption of internet banking

Path			B-Estimate	S.E.	C.R.	P Value	Adj. R^2	Hypo	Decision
Adopt	←	Value	0.080	0.044	1.826	0.068	0.777	H1a	Not Supported
Adopt	←	Ease	0.263	0.057	4.590	***		H1b	Supported
Adopt	←	CS	-0.018	0.029	-0.609	0.542		H1c	Not Supported
Adopt	←	Risk	0.151	0.067	2.244	0.025		H1d	Supported
Adopt	←	TF	0.593	0.049	12.111	***		H1e	Supported
Satisfy	←	Value	-0.162	0.042	-3.874	***	0.800	H2a	Supported
Satisfy	←	Ease	0.055	0.056	0.984	0.325		H2b	Not Supported
Satisfy	←	CS	0.136	0.028	4.885	***		H2c	Supported
Satisfy	←	Risk	0.386	0.065	5.951	***		H2d	Supported
Satisfy	←	TF	0.180	0.055	3.252	0.001		H2e	Supported
Satisfy	←	Adopt	0.501	0.050	10.021	***		H3a	Supported
Continue	←	Adopt	0.837	0.034	24.647	***	0.885	H4a	Supported
Continue	←	Satisfy	0.145	0.034	4.298	***		H4b	Supported

TESTING FOR MULTI GROUP MODERATING EFFECT:

To test the moderating interaction among the constructs, the study used the categorical variables: usage frequency, income level and age. Multigroup moderation technique is used (after Ketab et al., 2019). All three of the moderating variables are categorized into three groups: low, medium and high, respectively. Path analysis is done using these grouped data. However, this technique involves another extra step of ensuring that the comparison model created using the groups are valid. Only when both the model comparison and the respective path analysis produce statistically significant results, is the tested hypothesis considered as valid. Table 19 summarizes the findings after applying the multigroup moderation technique. It provides a clear decision on whether a chosen hypothesis is supported or not.

Table 19: Path Estimation and Model Comparison using SEM with moderating effect (internet banking)

Moderator	Path			Hypo.	Group 1: Low Frequency	Group 2: Medium Frequency	Group 3: High Frequency
Moderator: Usage Frequency	Adopt	←	Value	H5a	Not Supported	Supported	Not Supported
	Adopt	←	Ease	H5b	Not Supported	Not Supported	Not Supported
	Adopt	←	CS	H5c	Not Supported	Not Supported	Not Supported
	Adopt	←	Risk	H5d	Not Supported	Not Supported	Not Supported
	Adopt	←	TF	H5e	Supported	Supported	Supported
	Satisfy	←	Value	H5f	Not Supported	Not Supported	Not Supported
	Satisfy	←	Ease	H5g	Not Supported	Not Supported	Not Supported
	Satisfy	←	CS	H5h	Not Supported	Not Supported	Not Supported
	Satisfy	←	Risk	H5i	Supported	Not Supported	Supported
	Satisfy	←	TF	H5j	Not Supported	Not Supported	Not Supported
	Satisfy	←	Adopt	H5k	Not Supported	Not Supported	Not Supported
	Continue	←	Adopt	H5l	Not Supported	Not Supported	Not Supported
	Continue	←	Satisfy	H5m	Not Supported	Not Supported	Not Supported
Moderator: Income	**Path**			**Hypo.**	**Group 1: Low Income**	**Group 2: Medium Income**	**Group 3: High Income**
	Adopt	←	Value	H6a	Not Supported	Not Supported	Not Supported
	Adopt	←	Ease	H6b	Supported	Supported	Not Supported
	Adopt	←	CS	H6c	Not Supported	Not Supported	Not Supported
	Adopt	←	Risk	H6d	Not Supported	Not Supported	Not Supported
	Adopt	←	TF	H6e	Not Supported	Not Supported	Not Supported
	Satisfy	←	Value	H6f	Not Supported	Not Supported	Supported
	Satisfy	←	Ease	H6g	Not Supported	Not Supported	Not Supported
	Satisfy	←	CS	H6h	Supported	Not Supported	Supported
	Satisfy	←	Risk	H6i	Supported	Supported	Not Supported
	Satisfy	←	TF	H6j	Not Supported	Not Supported	Not Supported
	Satisfy	←	Adopt	H6k	Not Supported	Supported	Supported
	Continue	←	Adopt	H6l	Supported	Supported	Supported

Moderator	Path			Hypo.	Group 1: Low Frequency	Group 2: Medium Frequency	Group 3: High Frequency
	Continue	←	Satisfy	H6m	Not Supported	Not Supported	Not Supported
Moderator: Age	**Path**			**Hypo.**	**Group 1: Age 18 – 30**	**Group 2: Age 31 – 45**	**Group 3: Age 46 and above**
	Adopt	←	Value	H7a	Not Supported	Not Supported	Not Supported
	Adopt	←	Ease	H7b	Not Supported	Not Supported	Not Supported
	Adopt	←	CS	H7c	Not Supported	Supported	Not Supported
	Adopt	←	Risk	H7d	Not Supported	Not Supported	Not Supported
	Adopt	←	TF	H7e	Supported	Supported	Not Supported
	Satisfy	←	Value	H7f	Not Supported	Not Supported	Not Supported
	Satisfy	←	Ease	H7g	Not Supported	Not Supported	Not Supported
	Satisfy	←	CS	H7h	Not Supported	Not Supported	Not Supported
	Satisfy	←	Risk	H7i	Not Supported	Not Supported	Not Supported
	Satisfy	←	TF	H7j	Not Supported	Not Supported	Not Supported
	Satisfy	←	Adopt	H7k	Not Supported	Not Supported	Not Supported
	Continue	←	Adopt	H7l	Not Supported	Not Supported	Not Supported
	Continue	←	Satisfy	H7m	Not Supported	Not Supported	Not Supported

MEASURING THE INTERACTION EFFECT USING DAWSON AND RICHTER METHOD:

To examine the moderating effect via a continuous variable, Baron and Kenny moderation analysis (Hayes, 2009) is used. The interaction is created by multiplying standardized values of the exogenous variables and the moderating variable after each are centered to a mean of zero, respectively. The moderator and these interactions together are used to measure the interaction effects among the relationship between the exogenous and endogenous variables. The SEM are introduced with these interaction variables and treated as exogenous variables. Upon path

analysis, only the statistically significant paths are kept and the rest are truncated. The resultant SEM are summarized in Figure 34 and the Dawson Richter Plot (2006) are given in Figure 35 to 39.

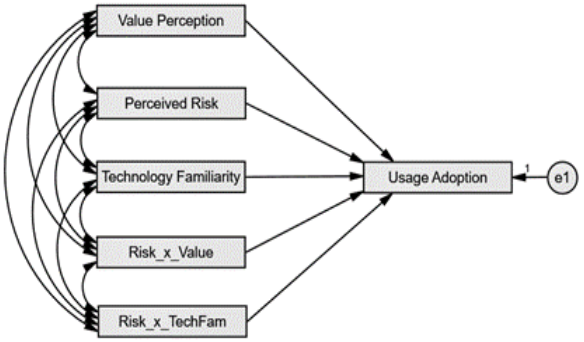


Figure 34 (a): SEM Interaction of Risk on Adoption of Internet Banking

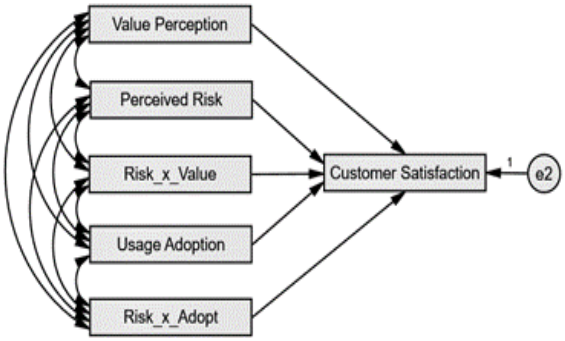


Figure 34 (b): SEM Interaction of Risk on Satisfaction of Internet Banking

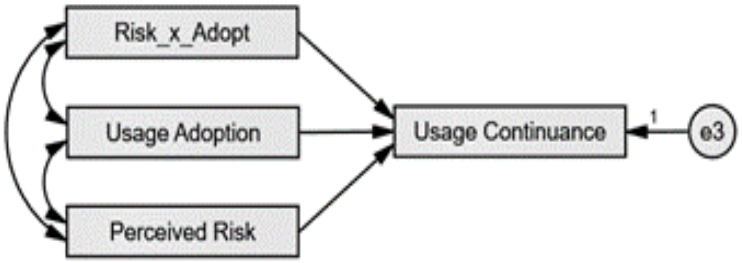


Figure 34 (c) SEM Interaction of Risk on Continuance of Internet Banking

Figure 34: Compilation of SEMs used to measure interaction effect by Perceived Risk

All interactions plotted are significant in nature, however their respective regression coefficients varied in weight and nature. Higher β estimate magnitude is characterized by higher weight in the moderation effect. Positive β estimate indicates a positive slope and the opposite for negative values.

Perceived Risk dampens the relationship between Usage Adoption-Technology familiarity (β=-0.051, p<***), as indicated by the decreasing slope at high risk. Same is the case for customer satisfaction and usage adoption (β=-0.089, p<***). Perceived risk also weakly dampens the relationship between usage continuance and usage adoption (β=-0.022, p<***).

The study encountered some seemingly odd findings in the form of the relationships between usage adoption-perceived value (β=0.042, p<***) and customer satisfaction-perceived-value (β=0.087, p<***). In both cases, the higher values of usage adoption and customer satisfaction are found in high-risk groups. This is characterized by the increasing slope in the high-risk groups, respectively.

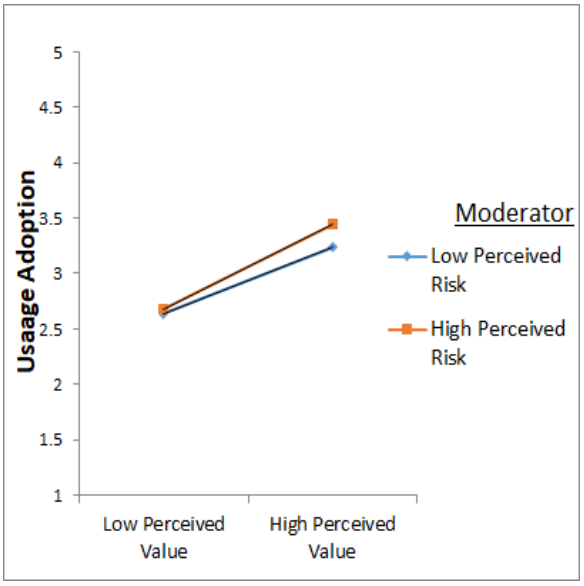


Figure 35: Impact of Perceived Value on Usage Adoption, moderated by Perceived Risk

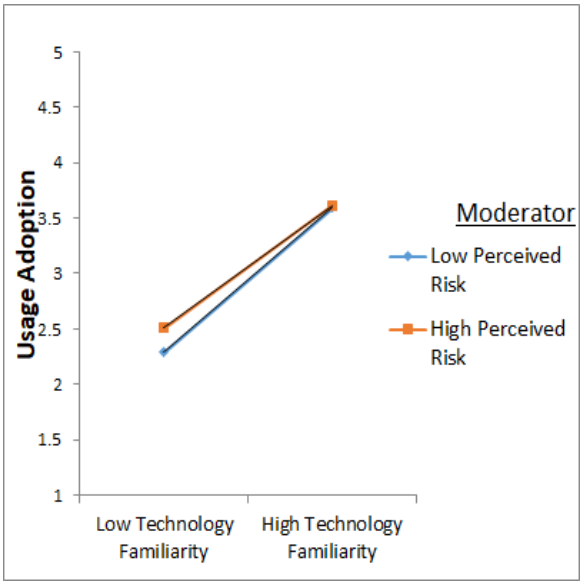


Figure 36: Impact of Technology Familiarity on Usage Adoption, moderated by Perceived Risk

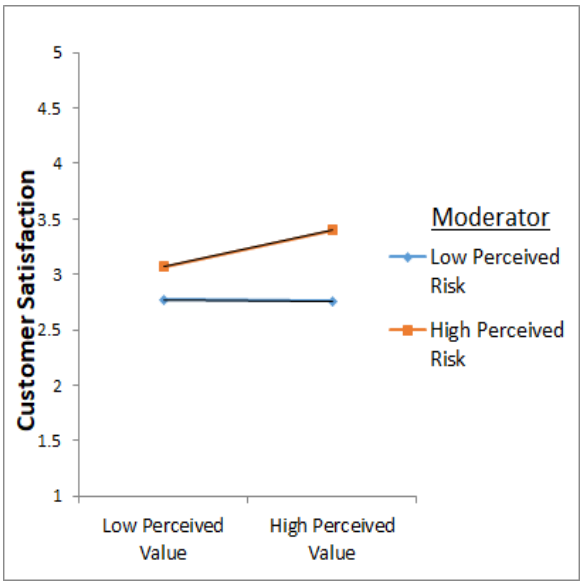


Figure 37: Impact of Perceived Value on Customer Satisfaction, moderated by Perceived Risk

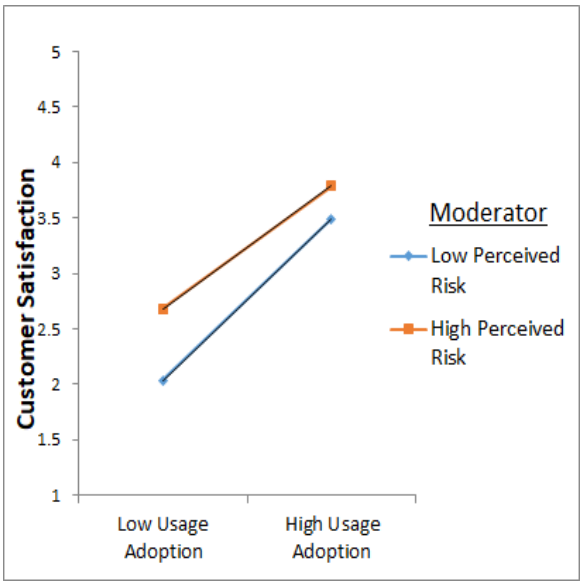


Figure 38: Impact of Usage Adoption on Customer Satisfaction, moderated by Perceived Risk

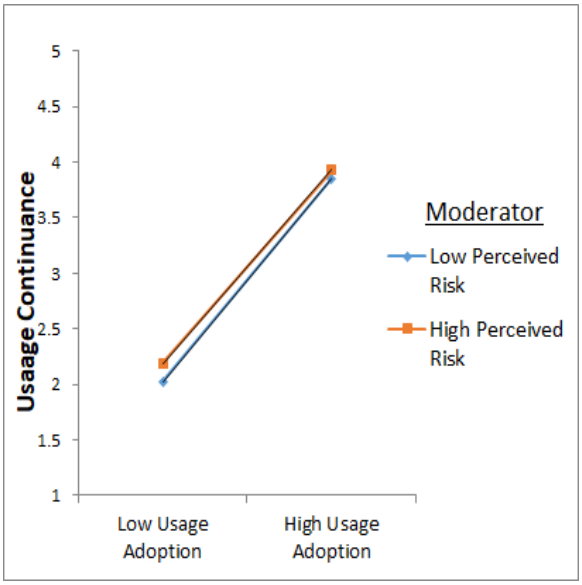


Figure 39: Impact of Perceived Value on Usage Adoption, moderated by Perceived Risk

5.5 Discussion on Findings

This section provides the critical analysis and discussion of the implementation of the proposed model in the specific context of Bangladesh and the outcome of the survey response. To begin the section, it is split into two different parts. One is the analysis of the factors and discussion on the survey findings and second is the comparison the findings with similar studies.

5.5.1 Analysis of findings

This study has scrutinized the internet banking adoption tendency of the existing customers using various statistical analyses. CFA is used to validate the conceptual framework and SEM to test the hypotheses. While unmoderated, it is found that Usage Adoption conforms to the hypotheses of being positively impacted by the Ease of Use, Customer Service, and Technology Familiarity. Customer Satisfaction on the other hand is positively impacted by the Perceived Value, Customer Service, Technology Familiarity and Usage Adoption. It is negatively affected by the Perceived Risk. Usage Continuance is confirmed to be positively impacted by both Usage Adoption and Customer Satisfaction. While moderated (using multi-group interaction), it is found that usage frequency, in-come level and age all moderated all the 21 different combinations of these IV-DV relationships. Interaction using the continuous variable Perceived Risk also produced intriguing results that showed damping effects in Adoption-Technology familiarity, Customer Satisfaction-Usage Adoption and Usage Continuance-Usage Adoption.

So, for someone to adopt internet banking, he/she must find it easy to use the application, find the customer service acceptable and have experience using web or mobile based applications (Lin et al., 2020). A customer will likely be satisfied with using internet banking if the technology adds a certain level of value to his or her life, doesn't find much risk in using the

application and, all the rest as needed to adopt the technology. If a customer adopts internet banking and is satisfied, he/she will continue using the technology. The usage frequency, income level and age have been found to control the way customers adopt, achieve satisfaction and continue to use the technology. The risk one perceives is another vital factor that negatively affects one's chances to adopt, be satisfied and thus continue to use internet banking.

In order to substantiate the findings of this study, a Focus Group Discussion (FGD) is done with industry experts from top commercial banks in Bangladesh. The group included personnel who lead the departments or sub departments that comprise of internet banking, possessing widespread experience in the field. The subject matter experts unanimously agreed with the findings from Table 20. Furthermore, the FGD demystified the seemingly confusing results in Figure 35. The groups perceiving higher risks are the ones who adopt and are more satisfied, with their internet banking. The underlying reason, agreed upon by the experts is that the perceived risk is the opportunity cost the customers bear in order to obtain the ability to make online transactions as well as avail any other associating facilities. Customers are aware that if their account credentials are compromised, they are highly likely to fall victim to fraud. This realization of risk is more among users who find greater value in the internet banking services being used. Lastly, the dampening effect of perceived risk in Figure 36, 38, 39 are also declared rational by the group.

The data and in-depth analysis points towards a few causal relationships and recommendations. Firstly, in order to get customers into adopting or start getting to use internet banking, banks must make them perceive ease and work on customer service. Current marketing tactics involve witty and promotional videos elucidating the easy-to-use application interface. To keep a customer satisfied, banks need to again put emphasis on customer service and ensure that

customers are able to do most of their transactional necessities via the internet banking application. They must also ensure positioning the technology as full-proof and thus risk-free. By guaranteeing seamless transaction and minimum transaction failures, banks will be able to build confidence among the customers. Thus, reliable switch technology needs to be implemented by the central bank. It is necessary to achieve better Customer Service and enhance Customer Experience. The study shows the risk of a transaction failing in customer's minds is one of the reasons the banks are not meeting the customer's service expectations. Lastly, banks could try appealing to certain age groups and income levels in order to better penetrate the market.

The thesis recommends the followings towards increased adoption of internet banking:

- Banks should focus on marketing activities, short video on key Internet Banking features, adding more value-added services to enrich the internet banking and reduce silent attrition.

- Branch banking should promote and support the internet banking more rigorously as the increase usage of internet banking will make the bank more cost efficient.

- Investment on internet banking is a must from central bank to all individual banks for more robust dispute free transactions, quicker resolution, hassle free transactions.

- Uniform account numbers for all banks, interoperable internet banking to curtail the dispute by traditional channels such as National Payment Switch Bangladesh (NPSB).

- Easy onboarding process to decrease customer attrition is a must for the banks for better market penetration.

- Trust can be considered as a primary construct.

• Educating customers about digital banking and basic security measures about not sharing PIN, password, OTP etc. should be considered an important activity for banks to protect customer's interest and gain their trust and confidence towards internet banking.

Based on the research question mentioned in chapter 1, the aim of the study is to find and scrutinize the issues that influence the acceptance of internet banking. From the above discussion on findings it is clear that the thesis has achieved that goal. As per the results of hypothesis testing, the issues that influence the acceptance of internet banking most are perceived value, customer service, technology familiarity and perceived risk.

5.5.2 Comparison of findings

The findings of the thesis are equated with some alike researches. The findings are compared in terms of

- the relationship among the different constructs used in the models,
- influence of different constructs on adoption confirmation, and
- moderating effect of different moderators on adoption and satisfaction.

For example, Rahaman et al. (2021) conducted a quantitative study to identify the determinants of internet banking system in Bangladesh. The study used five variables: perceived usefulness, perceived ease-of use, trust, social influence, and perceived enjoyment. The study also addressed the impact of moderators like gender and academic disciplines using ANOVA. Data were collected from 352 university students through surveys using a 5-point Likert scale. The final sample size is 300. The study found out that gender plays a role in the 'intention to use' and 'adopt' internet banking. Ease of use attracts male students more. Additionally, students of business administration show more intention and willingness to adopt internet banking. Although

the study is a contemporary one and reflects the impact of moderators on the determinants, the data is collected from only one group of potential user base. Thus, it is not reflective of the complete picture of the general factors affecting the adoption of online banking.

Another study conducted by Sabbir et al. (2020), collected 300 responses from students, job holders, businessmen and housewives, who were user of online banking services of seven private commercial banks and two state-owned commercial banks located in the Dhaka metropolitan area. The research considered five parameters, internet banking apps, perceived usefulness, perceived security, perceived ease of use and green concern and found significant impact of these factors on internet banking usage. Particularly, they found that internet banking use is more influenced by internet banking apps and perceived usefulness. This study only collected data only from Dhaka metropolitan area which does not provide a wholistic picture. Additionally, data were analyzed quantitatively and qualitative factors were not addressed. In contrast, data for this thesis were collected from a significantly diverse and larger group of people. On top of it, qualitative is collected from industry experts for in-depth analysis.

6 Chapter 6: Study on Adoption of Online Marketplace

This chapter focuses on the factors affecting the adoption of online marketplace . It starts with the proposed conceptual frameworks used in this thesis along with the development of hypothesis, a concise and precise description of the experimental results, their interpretation, as well as the drawn experimental conclusions. This chapter ends with the discussion on findings.

6.1 Proposed Conceptual Framework

The proposed conceptual framework has been developed based on the discussion in the section 3.2 of the thesis and also in light of the literature review in the Chapter 2. Especially, drivers and inhibitors from Technology Acceptance Model (TAM) and Technology Readiness Index (TRI) have been factored in while developing the conceptual framework.

Here, usage adoption and customer satisfaction has been considered to be the two key determinants of continuance of usage. Furthermore, perceived value, ease of use, customer services, perceived risk, and trust have been identified as the five factors affecting these two key determinants. Interrelations among the mentioned determinants and factors have been considered as well to test the multi-group moderating effect on adoption, customer satisfaction and usage continuance. The three moderators are income, age, and usage frequency.

Here, trust is introduced as an important construct. If people can trust any online shopping site, i.e. if they believe that what he/she is ordering from that site, he/she will get exactly the same product within the specified delivery time without any damage, only then he/she will buy from that site. Industry experts opined that, trust has significant influence on adoption behavior as it is related with product quality, on time delivery and also competitive pricing of any product item

listed in the online marketplace. Hence, trust is added in the conceptual framework to examine the adoption behavior of Bangladeshi consumers.

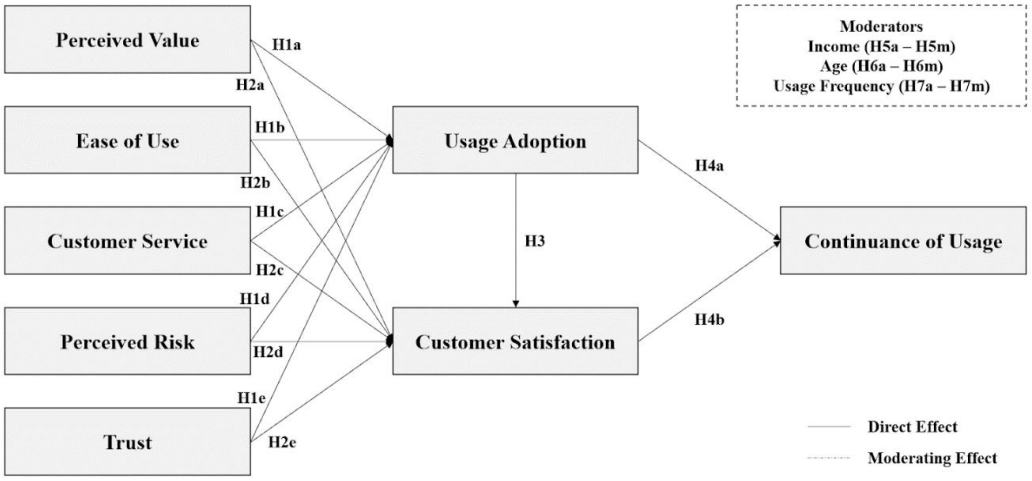


Figure 40: Conceptual framework for analyzing online marketplace

Based on the research question cited in chapter 1, the aim of the study is set to identify and study the factors that impact the usage of Online Marketplaces. For this, the following hypothesis are developed for analyzing the adoption of Online Marketplaces.

H1. Usage adoption is positively impacted by value perception, ease of use, customer service, and trust, and negatively impacted by perceived risks.

H2. Customer satisfaction is positively impacted by value perception, ease of use, customer service, and trust, and negatively impacted by perceived risks.

H3. Usage adoption has a positive impact on customer satisfaction.

H4. Continuance of Usage depends on usage adoption and customer satisfaction.

To have a better understanding of the factors affecting the adoption of ecommerce in Bangladesh, three moderating factors are incorporated to the framework: income, age, and usage

frequency. This will help determine if the nature of the relationship changes with changes in the moderators.

Table 20: List of Hypotheses for Multi-Group Moderators: Income, Age, and User Frequency

Path Relationship			Effect	Multi Group Moderators		
				Income	Age	Usage Frequency
Usage Adoption	<-	Perceived Value	+ve	H5 (a)	H6 (a)	H7 (a)
		Ease of Use	+ve	H5 (b)	H6 (b)	H7 (b)
		Customer Service	+ve	H5 (c)	H6 (c)	H7 (c)
		Perceived Risk	+ve	H5 (d)	H6 (d)	H7 (d)
		Trust	-ve	H5 (e)	H6 (e)	H7 (e)
Customer Satisfaction	<-	Perceived Value	+ve	H5 (f)	H6 (f)	H7 (f)
		Ease of Use	+ve	H5 (g)	H6 (g)	H7 (g)
		Customer Service	+ve	H5 (h)	H6 (h)	H7 (h)
		Perceived Risk	+ve	H5 (i)	H6 (i)	H7 (i)
		Trust	-ve	H5 (j)	H6 (j)	H7 (j)
	<-	Usage Adoption	+ve	H5 (l)	H6 (l)	H7 (l)
Continuance of Usage	<-	Usage Adoption	+ve	H5 (k)	H6 (k)	H7 (k)
		Customer Satisfaction	+ve	H5 (m)	H6 (m)	H7 (m)

6.2 Respondents' Profile

Table 21 shows demographic profile of the respondents. A total of 351 responses are collected as the initial sample. Out of this total of 351 cases, 136 (38.7%) are female and 215 (61.30%) are male; 184 (52.4%) are between 21 – 30 years old and 73 (20.8%) are between 31 – 40 years old, approximately 73% of the respondents. Majority of the respondent have education level above Bachelor's degree (a cumulative 60.0%), with the highest proportion having a Bachelor degree (31.90%). A total of 68.40% of the respondents have E-commerce usage experience for at least once in a week. Approximately 74% of the respondents have a monthly family income

below BDT 40,000. However, a significant 53.80% (189) have income level below BDT 20,000, representing low income group. One hundred seventy six respondents (37%) are employed in formal service sector. Furthermore, the study is composed of respondents from all the eight divisions of Bangladesh. Majority of the respondents (246) used E-commerce services on both websites and mobile apps based platforms.

Table 21: Demographic Profile of the Respondents (adoption of online marketplace)

Demographics		Male	Female	Total
Age Groups (in years)	<20 Years	31	10	41 (11.70%)
	21 - 30 years	119	65	184 (52.40%)
	31 - 40 Years	33	40	73 (20.80%)
	41 - 50 Years	23	19	42 (12.00%)
	51 - 60 Years	9	1	10 (2.80%)
	Over 60 years	0	1	1 (0.30%)
Total		**215 (61.30%)**	**136 (38.70%)**	**351 (100%)**
Education	SSC/O Level	16	9	25 (7.10%)
	HSC / A Level	82	30	112 (31.90%)
	Bachelor's Degree	63	49	112 (31.90%)
	Masters Degree	54	48	102 (29.10%)
Total		**215 (61.30%)**	**136 (38.70%)**	**351 (100%)**
Frequency of Using Mobile Financial Services (MFS)	Seldom	64	47	111 (31.60%)
	1 to 3 times	91	52	143 (40.70%)
	4 to 6 times	46	28	74 (21.10%)
	7 to 9 times	11	5	16 (4.60%)
	More than 9 times	3	4	7 (2.00%)
Total		**215 (61.30%)**	**136 (38.70%)**	**351 (100%)**
Income Level	Below 20,000 Tk	98	91	189 (53.8%)
	20,001-40,000 Tk	54	17	71 (20.2%)
	40,001-60,000 Tk	42	16	58 (16.5%)
	60,001-80,000 Tk	12	7	19 (5.4%)
	80,001-1,00,000 Tk	5	2	7 (2.0%)
	Above 1,00,000 Tk	4	3	7 (2.0%)
Total		**215 (61.30%)**	**136 (38.70%)**	**351 (100%)**
Occupation	Student	65	35	100 (28.5%)
	Government Service Holder	32	17	49 (14.0%)
	Private Service Holder	59	21	80 (22.8%)
	Businessman	38	13	51 (14.5%)
	Housewife	0	31	31 (8.8%)
	Others	21	19	40 (11.4%)
Total		**215 (61.30%)**	**136 (38.70%)**	**351 (100%)**

6.3 Evaluation of the Measurement Model

The sample adequacy test is conducted using Kaiser-Meyer-Olkin (KMO) measures of sampling adequacy with Barlett's Test of Sphericity. The summary result of these two tests is presented in Table 22 shows that it has achieved threshold value against the sample size.

Table 22: Sampling Adequacy of the model for adoption of online marketplace

KMO and Bartlett's Test	Value	Threshold
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	**.932***	**Middling****
***** *Bartlett's Test of Sphericity is Significant. (P value .000)*		
** *Results of KMO (*Cerny & Kaiser, 1977)		

To validate a conceptual model, it is essential to conduct confirmatory factor analysis i.e internal consistency (Cornbach's alpha, Composite Reliability), convergent validity (Factor loading and average variance extracted), and discriminant validity (Hair et al. 2016)**.**

CONFIRMATORY FACTOR ANALYSIS (CFA):

Using IBM SPSS AMOS Version 24, Confirmatory factor analysis (CFA) is conducted to check reliability and validity of the model, (Thompson.B, 2004). CFA is a form of factor analysis, used to *test* a proposed theory (CFA is a form of structural equation modeling), or model and *in contrast to Exploratory Factor Analysis (EFA),* has assumptions and expectations based on priori theory regarding the number of factors, and which factor theories or models best fit (Schreiber et al., 2006). The CFA model, represented in Figure 41, shows the estimation of each of the variables tested.

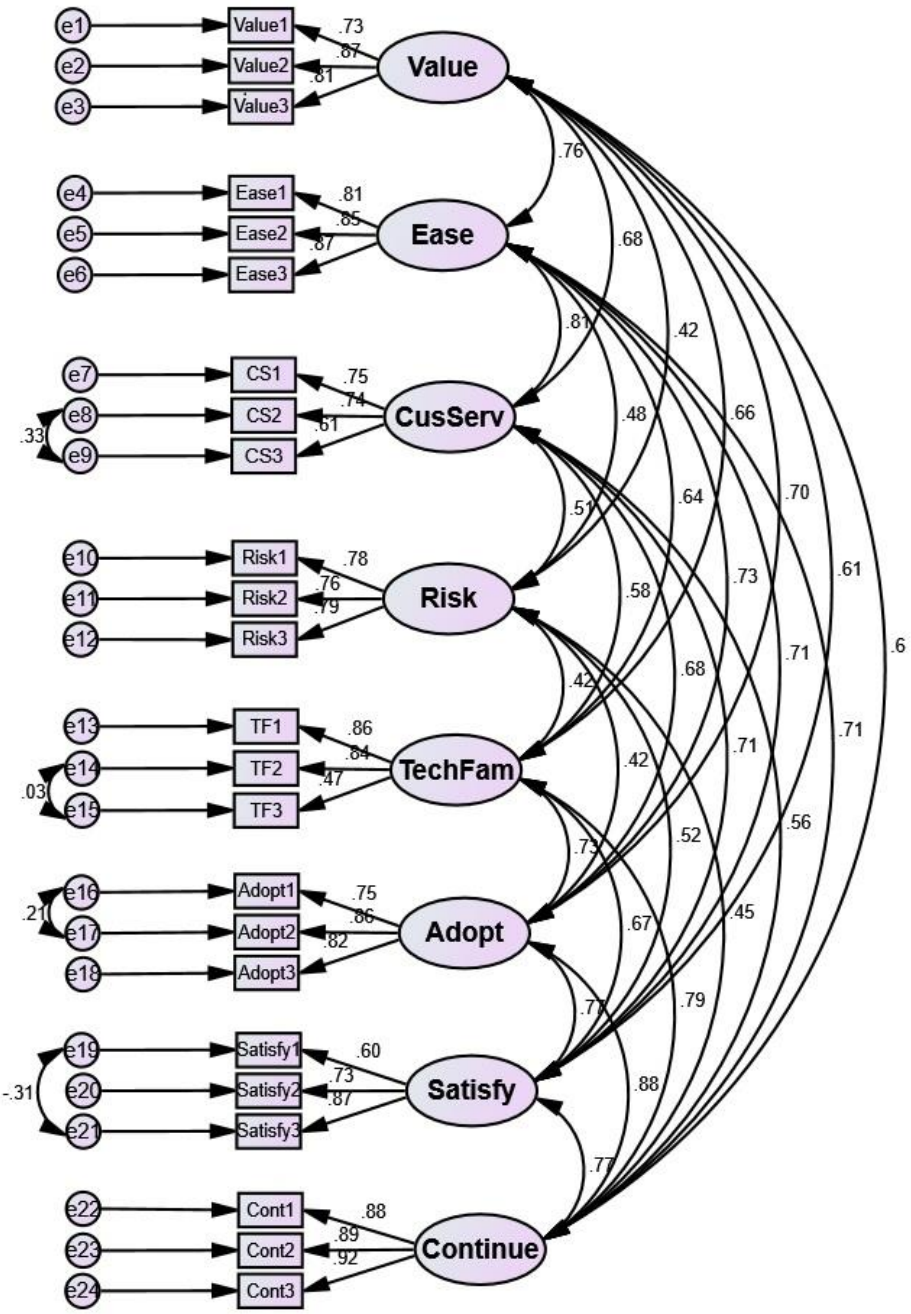


Figure 41: CFA Estimation using Standardized Regression Weights and Covariance (online marketplace)

The results of various fit indices (Shown in Table 23) of CFA model confirmed that all the indices i.e Comparative Fit Index (CFI) and Root mean square error of approximation (RMSEA) attained their acceptable points. Hence, it can be inferred that the data fit a hypothesized

measurement model. However, for evaluating a conceptual model, convergent reliability and the discriminant validity are crucial (Hair et al., 2016).

Table 23: Fit Indices of Confirmatory Factor Analysis (CFA) for adoption of online marketplace

Fit Indices	χ2*	P Close	CFI	RMSEA
Obtained Value	34.52	.001	.983	**.055**
Threshold Value **		***< .05***	***> .90***	***≤ .08***

Chi - Square* $H_1 = The\ data\ fit\ in\ hypothesized\ measurement\ model.$

Source: Handbook of SEM (West. Et al, 2012), Cornell Statistical Consulting Unit, Cornell Johnson University

CONVERGENT VALIDITY AND RELIABILITY:

Cronbach's alpha is run to check the internal consistency of the measurement items and all variables are higher than 0.70 (shown in Table 24), indicating high degree of reliability of items. Variables of a model should converge or share a high proportion of variance among them (Hair et al., 2016). Convergent validity is conducted by examining the factor loadings (standardized loadings) to check whether all variables are above 0.70, with 350 < sample size < 450 (Malhotra and Dash, 2011; Hair Jr. et al. 2016). Three items from these eight factors are excluded from the study either due to low communalities or cross loading in factor analysis. In general, the validity and reliability results indicated that all measurement items are well-represented and highly reliable variables.

Table 24: Convergent Validity and Reliability of Items for adoption of online marketplace

Constructs Items	Convergent Validity (Loadings)	Reliability (α)
Value Perception		**.714**
E-Commerce brings various services at the palm of my hand.	.575	
Using E-Commerce saves me money	.404	
E-commerce platforms help me find product easily	.523	
Technologies like E-commerce made my life easy	.539	
Perceived Ease of Use		**.835**
Learning to use E-Commerce was easy for me	.607	

Constructs Items	Convergent Validity (Loadings)	Reliability (α)
I find E-Commerce easy to use	.518	
E-commerce is easy for me to make transactions	.513	
It's very easy for me to buy from e-commerce sites	.561	
Customer Service		**.839**
E-Commerce allows me to get 24/7 service	.629	
E-Commerce companies in Bangladesh provide excellent services	.553	
E-Commerce companies in Bangladesh resolve complaints within my desired time	.637	
E-Commerce companies in Bangladesh take return instantly if I don't like the profuct	.636	
Perceived Risk		**.816**
The risk of misuse of personal data is low	.559	
I believe that the ecommerce company will keep my financial information secure.	.562	
I believe that there is no risk related to product non delivery	.620	
I believe that there is no hacking risk related to my personal data	.626	
Trust		**.848**
I believe that the products ordered will match the descriptions.	.587	
I believe that the products that I receive are not fakes.	.624	
I believe that the products that I receive will be damaged	.786	
I have faith in purchasing from e-commerce sites	.536	
Customer Satisfaction		**.784**
I feel that I made the right decision to avail E-Commerce services.	.463	
Using ecommerce platform is now a necessary part of my day to day life	.450	
I always get expected services while purchasing from ecommerce platforms	.485	
Usage Adoption		**.735**
I use E-Commerce platforms for its useful features	.448	
I feel the need to use e-commerce platforms and all associated services	.575	
I prefer E-Commerce platforms over retail stores.	.476	
I believe that people will use e-commerce platforms if desired service is ensured	.603	
I believe that people will use e-commerce platforms as the platforms are easy to use	.862	
Continuance Intention		**.818**
I am habituated with using E-Commerce services.	.546	
I will continue to use E-Commerce services.	.544	
I will increase the use of E-Commerce services in the future.	.688	
I'm interested to buy more and more from e-commerce sites.	.644	

Reliability (α) = Cronbach's Alpha, and Loadings = Factors Loadings

DISCRIMINANT VALIDITY:

Discriminant validity measures the extent to which a variable is truly distinct from other variables (Hair et al., 2016). The comparison of the constructs in sharing variance (squared correlation) is tested by discriminant validity through the AVE of each variables (Fornell and Larcker, 1981). Table 25 shows that the square roots of the AVE (bold) are all higher, except perceived risk, from the diagonal correlation values, result that indicates adequate discriminant validity (Farrell, A. M. 2010).

Table 25: Factor Correlation Matrix for adoption of online marketplace

	MSV	Trust	Perceived_Value	Usage_Ease	Customer_Service	Perceived_Risk
Trust	0.614	0.550				
Perceived_Value	0.720	0.464	0.547			
Usage_Ease	0.609	0.414	0.659	0.534		
Customer_Service	0.588	0.663	0.471	0.386	0.710	
Perceived_Risk	0.778	0.744*	0.536	0.512	0.699	0.703

Extraction Method: *Maximum Likelihood.* Rotation Method: *Promax with Kaiser Normalization.*

Notes: Diagonal italic figures are the square root of AVE. MSV = Maximum Variance Extracted

Significance of Correlations: * p < 0.050, ** p < 0.010, *** p < 0.001

6.4 Hypothesis testing

First, the drivers and inhibitors that have direct effect on adoption of online marketplace are analyzed. Then the moderating effect of Income, Age, and Use frequency of online marketplace is checked and finally, the mediated moderating Effect of perceived risk is analyzed.

DIRECT EFFECTS OF FACTORS ON E-COMMERCE PLATFORM SERVICES:

The structural equation model (SEM) tested the hypothesized relationship between the constructs. Table 26 below shows that Perceived Risk has a negative effect on usage adoption of E-commerce platforms in Bangladesh. The estimated paths are statistically significant at 0.001 level (ß = 0.226 p= 0.000 < 0.001). Furthermore, Ease of Use has shown direct impact in determining usage adoption of E-Commerce platforms, the results are also statistically significant at 0.01 level (p= 0.000 < 0.001) with ß = 0.368. Although perceived value does not guarantee usage adoption, it has a direct positive impact on Customer satisfaction of using E-commerce platforms, the result is statistically significant at 0.01 level (p= 0.000 < 0.001) with ß =0.232. Moreover, both Customer's Trust and Usage adoption Confirmation have direct positive impact towards customer satisfaction. The estimated paths are also statistically significant at 0.001 level (p= 0.000 < 0.001) with ß = 0.146 and 0.271 respectively. Therefore, these findings support our hypothesis H1b, H1d, H2a, H2d, and H2f.

The coefficient of determination (R^2 value) represents a measure of in-sample predictive power (Sarstedt and Mooi, 2014). R^2 values within the range of 0.07 and 0.15 are considered high in disciplines such as consumer behavior (Hair et al., 2016). In this analysis, R^2 represented a significant value of 0.50 in case of usage adoption; this means that 50.00% of usage adoption in online E-commerce is explained by Perceived Risk, and Ease of Use. A similar R^2 result is also found in case of perceived value, customer's trust, and usage adoption towards E-commerce

platforms' customer satisfaction, meaning perceived value, customer's trust, and usage adoption explained 23.00% of Customer satisfaction. However, a significant R^2 value of 0.58 is found in case of Continuance intention, a result that indicates that usage adoption and customer satisfaction explain maximum 58% variations in Continuance of intention than any other factor.

Table 26: Path Estimates of SEM with No Moderating Effect (online marketplace)

Path			β Estimate	S.E.	C.R.	P Value	R^2	Hypothesis	Result
Usage_Adoption	<---	Perceived_Value	.124	.071	1.739	.082	**.50**	H1a	Not Supported
Usage_Adoption	<---	Usage_Ease	.368	.062	5.966	***		H1b	**Supported**
Usage_Adoption	<---	Customer_Service	.022	.041	.535	.593		H1c	Not Supported
Usage_Adoption	<---	Perceived_Risk	.227	.057	4.013	***		H1d	**Supported**
Usage_Adoption	<---	Trust	.098	.052	1.900	.057		H1e	Not Supported
Customer_Satisfaction	<---	Perceived_Value	.232	.061	3.834	***	**.23**	H2a	**Supported**
Customer_Satisfaction	<---	Usage_Ease	.097	.055	1.773	.076		H2b	Not Supported
Customer_Satisfaction	<---	Customer_Service	.106	.035	3.023	.003		H2c	Not Supported
Customer_Satisfaction	<---	Trust	.146	.044	3.316	***		H2d	**Supported**
Customer_Satisfaction	<---	Perceived_Risk	.080	.049	1.629	.103		H2e	Not Supported
Customer_Satisfaction	<---	Usage_Adoption	.271	.045	5.964	***		H2f	**Supported**
Usage_Continuance	<---	Usage_Adoption	.398	.047	8.442	***	**.58**	H3	**Supported**
Usage_Continuance	<---	Customer_Satisfaction	.464	.048	9.595	***		H4	**Supported**

******P <.001, S.E = Standard Error, C.R = Critical Ratio, and β = Regression Coefficient, R^2 = R squared***

WITH MODERATING EFFECT OF INCOME, AGE, AND USE FREQUENCY OF RESPONDENTS:

The moderating effect of Income, Age, and Use frequency of MFS is checked by splitting the sample into two groups, with Low income (189 respondents) vs. Middle or high income (162 respondents), Young aged (225 respondents) vs. Middle aged or Elderly (126 respondents), and

Low user (254 respondents) vs. High user (97 respondent) respectively. This is tested by running analyses in IBM SPSS AMOS to observe "standardized" group differences. The z-score is a statistical transformation that specifies how far a particular value lies from the mean of a normal distribution in terms of standard deviations, z-scores are particularly helpful in comparing observations that come from different group and from distributions with different means, standard deviations, or both.

Respondents are categorized in above groups based on median score of income (below BDT 40,000 as low income group), age (young and elderly), and use frequency (at most a single use of E – commerce platform in a week as less frequent users). Table 27 presents all indexes. The moderating effect (Sobel, 1982) for income, age, and use frequency, is seen when the Z – value for the difference between groups is significant, $p < 0.001$, $p < 0.05$, and $p < 0.10$, meaning that there is an indirect effect of moderators. Table 27 shows that most of the factors did not present significant group differences associated with usage adoption, customer satisfaction, and continuance intention.

However, only Perceived Risk did present significant group differences associated with usage adoption in less frequent user group and most frequent user group. Similar results are also observed in the effect of Customer Satisfaction on usage continuance intention for both lower income and higher income group. These findings support our hypothesis.

Table 27: Path Estimates of SEM with Moderating Effect (online marketplace)

Path			***Z Score for Moderators***			**Direct Effect (From Table – 7)**	**Moderating Effect Result**	**Hypothesis Supported**
			Income	Age	Use Frequency			
Usage_Adoption	<---	Perceived_Value	1.252	-0.610	1.604	Not Supported	No effect	--
Usage_Adoption	<---	Usage_Ease	-0.198	1.559	-0.658	**Supported**	No effect	--
Usage_Adoption	<---	Customer_Service	-0.942	-0.055	0.547	Not Supported	No effect	--
Usage_Adoptio	<--	Perceived_Risk	0.018	-0.937	**-2.797*** **	**Supported**	**Use**	**H7 (d)**

Path			*Z Score for Moderators*			Direct Effect (From Table – 7)	Moderating Effect Result	Hypothesis Supported
			Income	Age	Use Frequency			
n	-						**Frequency**	
Usage_Adoption	<---	Trust	-0.223	-0.919	0.533	Not Supported	No effect	--
Customer_Satisfaction	<---	Perceived_Value	0.072	0.224	-0.794	**Supported**	No effect	--
Customer_Satisfaction	<---	Usage_Ease	-1.246	0.508	-0.024	Not Supported	No effect	--
Customer_Satisfaction	<---	Customer_Service	0.881	-0.438	1.449	Not Supported	No effect	--
Customer_Satisfaction	<---	Trust	-0.652	-1.088	-1.129	**Supported**	No effect	--
Customer_Satisfaction	<---	Perceived_Risk	-0.378	0.869	-0.681	Not Supported	No effect	--
Customer_Satisfaction	<---	Usage_Adoption	0.128	-1.393	-0.142	**Supported**	No effect	--
Usage_Continuance	<---	Usage_Adoption	1.033	-0.254	-0.055	**Supported**	No effect	--
Usage_Continuance	<---	Customer_Satisfaction	**-3.554*** **	-0.679	0.284	**Supported**	**Income Level**	**H5(m)**
P <.001, **P <.05, *P <.10, Z Score								

MEDIATED INTERACTION OF PERCEIVED VALUE BETWEEN RISK AND USAGE ADOPTION:

As shown in the figure below, both the intercept and the term and the coefficient term for the regression line of the high value is higher than that of the low value. This indicates that with higher perceived value, the relationship between usage adoption and risk will be stronger. Generally, the relationship between usage adoption and risk is negative, meaning an increase in risk will decrease usage adoption. Thus, in this medicated interaction between perceived value, risk and usage adoption, usage adoption will decrease with the increase in risk if the perceived value is higher, and vice-versa.

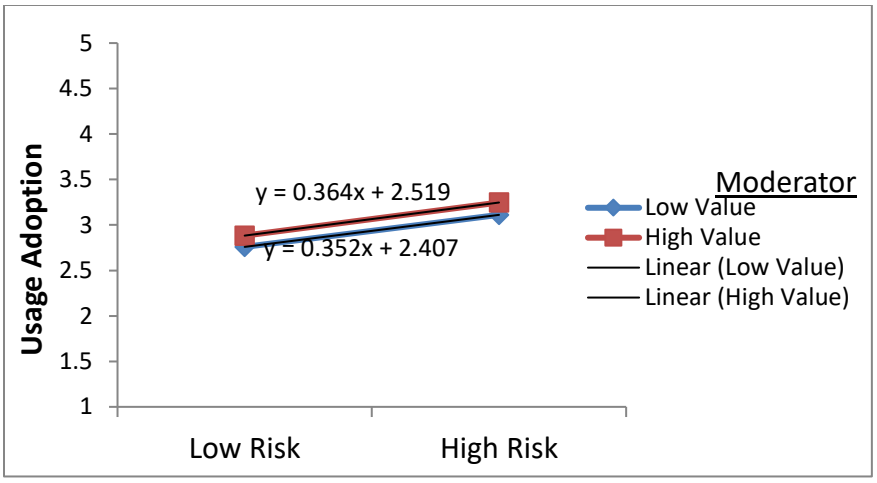


Figure 42: Mediated Interaction of Perceived Value between Risk and Usage adoption

MEDIATED INTERACTION OF PERCEIVED RISK BETWEEN EASE OF USE AND USAGE ADOPTION:

As shown in the figure below, for lower risk, usage adoption increases with higher ease of usage. On the other hand, with higher risk, usage adoption decreases with higher ease of usage. This suggests that an increase in the risk factor might alter the relationship between ease of usage and usage adoption. Since higher ease of usage generally leads to higher usage adoption, it is essential to limit the risk factor so that the ease of usage does not reduce the usage adoption.

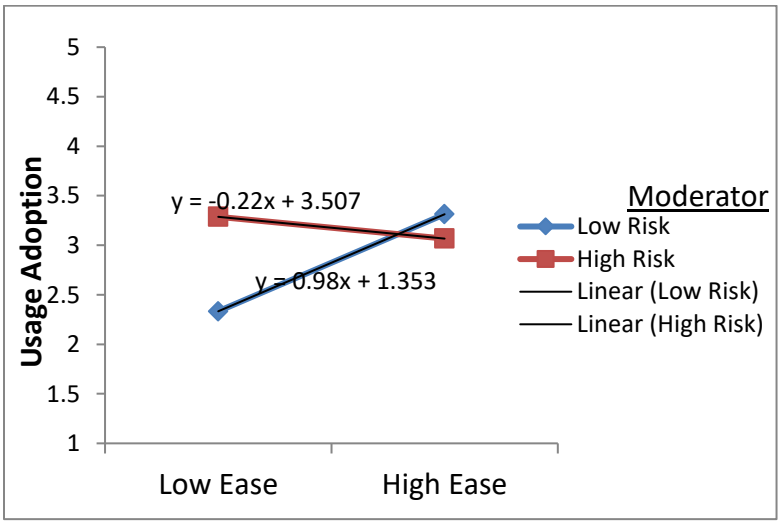


Figure 43: Mediated Interaction of Perceived Risk between Ease of Use and Usage adoption

MEDIATED INTERACTION OF PERCEIVED RISK BETWEEN PERCEIVED VALUE AND CUSTOMER SATISFACTION:

As shown in the figure below, higher risk dampens the relationship between perceived value and customer satisfaction. But the magnitude of dampening is not as significant as the effect of risk on the relationship between usage adoption and ease of use. Here, with lower risk, customer satisfaction increases with the increase in the perceived value. A similar relationship exists between the two components with high risk as well, however, the line is less steep. This indicates that with higher risk, the increase in customer satisfaction with higher perceived value will be lower than that with lower risk.

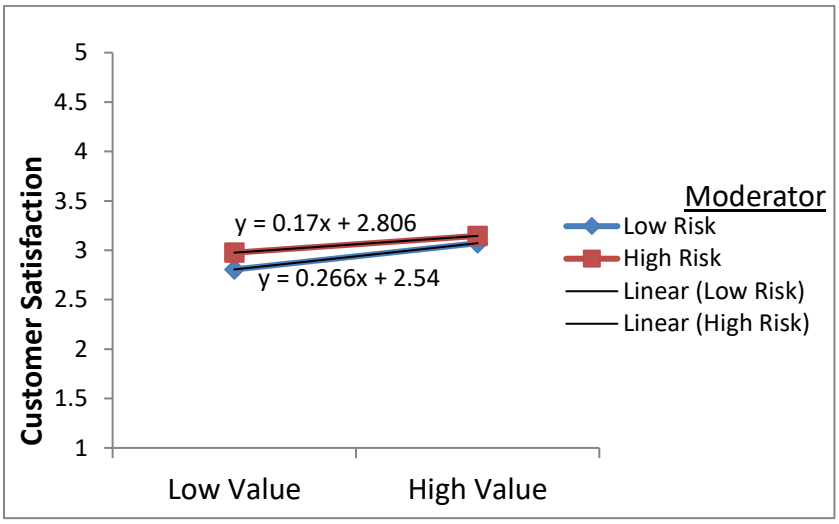


Figure 44: Mediated Interaction of Perceived Risk between Perceived Value and Customer Satisfaction

MEDIATED INTERACTION OF PERCEIVED RISK BETWEEN TRUST AND CUSTOMER SATISFACTION:

As shown in the figure below, higher risk dampens the positive relationship between trust and customer satisfaction. With lower risk, customer satisfaction increases at a higher rate with the increase in trust in comparison to that with higher risk. This means that the magnitude of positive relationship between trust and customer satisfaction will be the same for higher levels of risk.

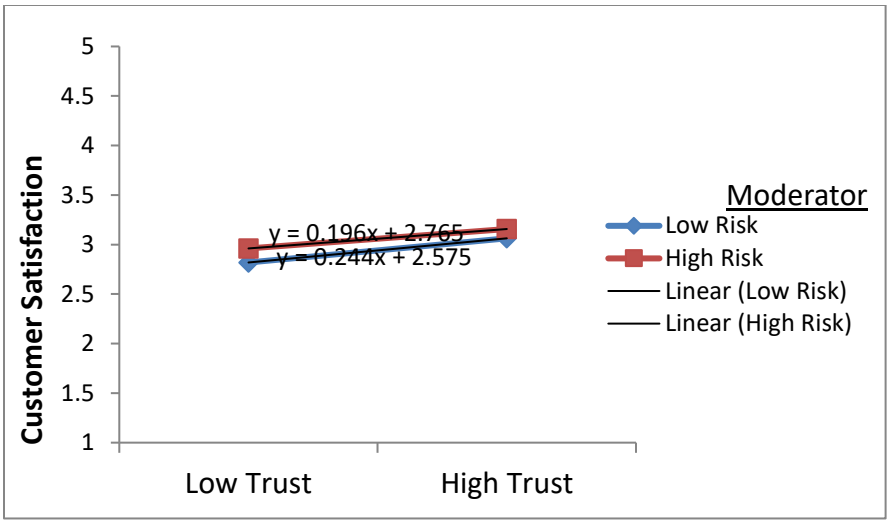


Figure 45: Mediated Interaction of Perceived Risk between Trust and Customer Satisfaction

6.5 Discussion on findings

This section provides the critical analysis and discussion of the implementation of the proposed model in the specific context of Bangladesh and the outcome of the survey response. To begin the section, it is split into two different parts. One is the analysis of the factors and discussion on the survey findings and second is the comparison the findings with similar studies.

6.5.1 Analysis of findings

This thesis has examined the adoption tendency of online marketplace among the individual customers using various statistical analyses. CFA is used to validate the conceptual framework and SEM to test the hypotheses. Results found that, perceived risk has a negative effect on usage adoption of e-commerce platforms. In this case, the idea of risk is associated with product quality and on time delivery. The relationship of risk and product quality is confirmed by industry experts as well. The issue is like sometimes the customers are choosing a particular product from a variety of items of the same kind ranging from a wide price range. So, by seeing the picture of

the item they are unable to assess the quality but may be for the lower price they are ordering it. While they are receiving the item, then sometimes they are feeling that the quality is not that good. The industry experts opined that, this issue can be minimized by grouping the variety of items in different price and quality groups using artificial intelligence techniques, so that the customers can understand it at the time of ordering. Also, when customers are choosing a product from a variety of items in the same product category, sometimes they are unable to assess the quality of the product by seeing the catalog picture at the time of ordering and thus perceiving product quality risk. This phenomenon is also impacting trust. Experts opined that, actual picture of the item should be added along with catalog picture to solve this issue.

The study also found that, trust and adoption confirmation have direct positive impact towards customer satisfaction. Trust is associated with product quality, as mentioned above, and also with efficient and on time delivery. Experts mentioned that, if the customers get the ordered item within the stipulated delivery time and without any physical damage all the time, then trust towards the online marketplace strengthens and customers are inspired to order more.

Based on the research question cited in chapter 1, the aim of the study is to find and study the factors that impact the usage of Online Marketplaces. From the above discussion on findings it is clear that the thesis has achieved that goal. As per the results of hypothesis testing, the factors that impact the usage of Online Marketplaces most are perceived risk and trust.

6.5.2 Comparison of findings

The findings of the thesis are equated with some alike researches. The findings are compared in terms of

- the relationship among the different constructs used in the models,
- influence of different constructs on adoption confirmation, and
- moderating effect of different moderators on adoption and satisfaction.

While comparing the findings of the thesis with similar researches, no study was found focusing solely on the adoption of online marketplaces in the context of Bangladesh. Only one study was found similar that was conducted by Rahman and Sloan (2017). They tested a model for predicting user adoption of e-commerce using mobile phones in developing countries. TAM was used in this study for the development of the model. The study concluded that perceived risk and perceived usefulness affects the adoption of mobile commerce most. They also found a low but substantial impact of perceived ease of use and personal awareness on adoption. They established the necessity of extending TAM model in the context of studying adoption of mobile commerce as well. Additionally, the study recommended the enhancement of security and privacy of users to reduce perceptions of risk and upgrading the technology behind it to international standards. But they didn't discuss anything about the different dimensions of perceived risk that is covered in this thesis. Also, they didn't consider trust as a construct in their model. But this thesis found trust to of utmost importance that plays a vital role among the customers while deciding to purchase from online marketplaces.

7 Chapter 7: Conclusion

This thesis explored different factors of e-commerce adoption in the context of Bangladesh by segmenting e-commerce into three specific areas: MFS, Internet Banking and Online Marketplace. To analyze the adoption situation the thesis developed three conceptual frameworks for the three study areas through extensive literature review and also by consulting the industry experts via depth interviews and FGDs. Among the established theories and models for studying acceptance of technology, Technology Acceptance Model (TAM) and Technology Readiness Index (TRI) were considered to develop the conceptual models. Five additional constructs were added with the determinants of TAM and TRI to study the adoption behavior of the individual consumers.

This chapter concludes the thesis with the discussion on findings and directions for future research.

7.1 Discussion on findings

As mentioned above, the thesis examined the adoption situation of MFS, internet banking, and online marketplace. In doing so, hypotheses are developed as per the proposed conceptual frameworks and tested via consumer survey. The thesis suggests an extension of Technology Acceptance Model (TAM) with five new constructs which are context specific from Bangladesh perspective. The new constructs are: Value perception, Perceived risk, Customer Service, Technology Familiarity and Trust. The thesis makes very important contribution in terms of effective adaptation of e-commerce in the context of Bangladesh. Particularly, the industry experts wholeheartedly accepted the results of the thesis. Because, the academic outcome of the thesis can be effectively linked and correlated with the business objectives of different e-

commerce companies, and successfully translated to be used for promoting their business growth. The following sub sections discusses the findings of the three sub segments of e-commerce adoption.

7.1.1 Adoption factors of MFS

In case of adoption of MFS, the result shows that customer satisfaction is directly and significantly influenced by perceived risk, ease of use and value perception. From the direct effect of adoption confirmation and customer satisfaction on forming positive brand attitude, it is found that Customer Satisfaction exerted strong influence. This finding is also statistically significant with the moderating effect of income, residence, and use frequency of MFS.

Findings from mediated moderating effect discovered that perceived risk diminishes the positive effect of users' value perception of MFS on adoption confirmation. This means, when perceived risk of using MFS is low, there is a positive relationship between value perception of MFS and its adoption confirmation. On the other hand, when perceived risk of such service is high, there is negative relationship between these two constructs. This observation also holds true for the positive effect of value perception on customer satisfaction of MFS. With the mediated moderating effect of perceived risk of such services, there is a positive effect of customer satisfaction on positive brand attitude towards MFS. However, perceived risk doesn't have any mediated moderating effect on the positive relationship between customer satisfaction and continuance intentions of MFS.

7.1.2 Adoption factors of Internet Banking

The findings for internet banking adoption study shows that, ease of use, customer service and technology familiarity positively influence usage adoption. Customer satisfaction on the other

hand is positively impacted by the value perception, customer service, technology familiarity and usage adoption, and negatively affected by the perceived risk. Usage Continuance is established to be positively impacted by both Usage Adoption and Customer Satisfaction.

A customer will likely be satisfied with using internet banking if the technology adds a certain level of value to his or her life, doesn't find much risk in using the application and, all the rest as needed to adopt the technology. If a customer adopts internet banking and is satisfied, he/she will continue using the technology. The usage frequency, income level and age have been found to control the way customers adopt, achieve satisfaction and continue to use the technology. The risk one perceives is another vital factor that negatively affects one's chances to adopt, be satisfied and thus continue to use internet banking. But the study found that, the groups perceiving higher risks are the ones who adopt and are more satisfied, with their internet banking. This finding is consulted with the industry experts via FGD. The underlying reason, agreed upon by the experts is that the perceived risk is the opportunity cost the customers bear in order to obtain the ability to make online transactions as well as avail any other associating facilities. Customers are aware that if their account credentials are compromised, they are highly likely to fall victim to fraud. This realization of risk is more among users who find greater value in the internet banking services being used.

7.1.3 Adoption factors of online marketplace

In case of online marketplace, the thesis similarly found that, perceived risk has a negative effect on usage adoption of e-commerce platforms. Here, the risk perception is associated with product quality and on time delivery. The industry experts also endorsed the relationship of risk and product quality. The issue is like sometimes the customers are choosing a particular product from

a variety of items of the same kind ranging from a wide price range. So, by seeing the picture of the item they are unable to assess the quality but may be for the lower price they are ordering it. While they are receiving the item, then sometimes they are feeling that the quality is not that good. The industry experts opined that, this issue can be minimized by grouping the variety of items in different price and quality groups using artificial intelligence techniques, so that the customers can understand it at the time of ordering. Also, when customers are choosing a product from a variety of items in the same product category, sometimes they are unable to assess the quality of the product by seeing the catalog picture at the time of ordering and thus perceiving product quality risk. This phenomenon is also impacting trust. Experts opined that, actual picture of the item should be added along with catalog picture to solve this issue.

Findings from the thesis also suggests that, customer satisfaction is directly influenced by trust and adoption confirmation. Trust is associated with product quality, as mentioned above, and also with effective and prompt delivery. Experts revealed that, if the customers get the ordered item within the stipulated delivery time without any physical damage, then trust towards the online marketplace fortifies and customers are inspired to order more.

7.1.4 Industry feedback

The findings of the study have practical implications in terms of making marketing decisions in favor of the e-commerce companies. While the research results are shared with the industry experts, they admired it and also accepted and supported majority of the findings. They also opined in support of conducting this sort of research more in future to support them in making effective and efficient business decisions. Because, the industry practitioners can use the findings of this thesis to expedite adoption, improve user experience, and retain users of e-commerce. The

study also provides guidance for development of value proposition, market segmentation, brand positioning, and brand awareness.

The thesis identifies the factors contributing to the adoption of e-commerce. This means organizations or individuals can focus more on these factors to expedite the adoption process. The thesis findings pin points the important parameters to the industry in this regard. Then, after adoption, sustainability of the business depends on the retention and repeated usage of the users. The thesis also guides the business organizations by suggesting specific activities for this. The study provides guidance regarding the measures to enhance user experience for higher retention and customer satisfaction. Two use cases of two prominent organizations, namely bKash and Foodpanda can be cited as examples of applications of the findings of the study.

BKASH - MINIMIZING THE RISK PERCEPTION: The thesis makes specific suggestion to MFS companies like bKash on how to reduce the risk perception among the customers. The study proposes that MFS companies should effectually communicate their customers by demonstrating the lapses they do while using the service and create awareness in this regard. For example, bKash can show the customer that, if any bank account holder leaves a signed cash cheque on his/her table unguarded, then anybody can get hold of it and withdraw money from his/her bank account. Sharing an OTP or pin number of anyone's bKash account is as risky as the signed cash cheque. So, the customer should not share the pin number or OTP with anyone. They should not deviate from the standard security protocol and thus can minimize the risk of any fraudulent activity. By communication in this way, MFS companies can reduce the perceived risk of the customers and thus can increase the adoption of mobile financial services.

FOODPANDA - IMPROVING CUSTOMER SERVICE: The thesis suggested the popular food delivery app 'Foodpanda' to improve their customer service during the food delivery process. Earlier they don't have any real time messaging option in their app. So, customers were unable to contact them if required during the food delivery process. Customer were able to contact them through email only. Also, for promoting e-commerce business it is necessary to encourage customers to pay online for the goods and services they are purchasing. But the policy of Foodpanda is negatively influencing the customers to pay online and go for cash on delivery. They were not refunding while the customers were paying online but not getting the food delivery for any reason. This research pin pointed these issues and Foodpanda introduced real time messaging option for customers in their app and also started making refund for undelivered food, if necessary, while the customers pay online. This encouraged customers more to adopt online food delivery services.

In this way, the thesis guided business organizations to design specific actions in light of the findings of the study for the specific business problems in the industry. Therefore, the industry practitioners enthusiastically praised the research work.

7.1.5 Summary

As per the research question, the objective of the thesis is to analyze the factors that affect the adoption of e-commerce among the individual consumers of Bangladesh. From the above discussion, it can be said that the thesis successfully addressed the research question by fulfilling the objective of the study. By combining the findings of the three sub-segments, study on adoption factors of MFS, internet banking and online marketplace, the thesis find out the factors affecting e-commerce adoption in the context of Bangladesh. The factors are: perceived risk,

ease of use, value perception, customer service, technology familiarity and trust. To summarize the findings of the three study areas, 'Perceived Risk' is found to have a negative effect on the adoption of all e-commerce platforms. Thus, steps are required to minimize this factor. On the other hand, other factors like 'Value perception', 'Customer Service', 'Technology Familiarity', and 'Trust' are added to the existing model and found to have positive effect on the adoption of e-commerce. 'Trust' and 'Adoption Confirmation' are found to have positive impact on customer satisfaction as well. These additional factors stem from the specific traits and expectations of the potential users of e-commerce in Bangladesh. These may or may not be applicable to e-commerce users of other countries or other specific groups of countries like developing countries. However, the impact of these constructs has to be factored in to increase the adoption of e-commerce.

Therefore, it is evident that the thesis has addressed the research question successfully and made very important contribution by filling up the existing research gap in the study area of e-commerce in terms of its effective adaptation in the context of Bangladesh.

7.2 Limitations and Directions for Future Research

As mentioned earlier, this thesis makes some great contribution in existing literature by filling up the research gap in the field of e-commerce in the context of Bangladesh by successfully addressing the research question. The study also links the academic findings with industry by translating and relating it with their business objectives and practices, and suggesting specific action plans to promote e-commerce.

However, this work is not without any limitation. One such limitation is related with the research context. Because, contexts are changing all the time. Contextual variables are dynamic and

evolving in nature. For example, legal and regulative framework of a country is not static. The central bank of the country, Bangladesh Bank is continuously enforcing different circulars to regulate the commercial banks. Also, in a country like Bangladesh, the complete e-commerce regulatory framework is yet to be established. There are lots of regulatory loopholes, and fraud e-commerce companies are taking advantage of that. As a result, trust of the consumers is being fraught and thus hampering the adoption of e-commerce. Therefore, in future, due to context change, the proposed conceptual frameworks of the thesis may face adaptivity problem. In that case, the frameworks might need to add some extra parameters that will focus on tackling the dynamically evolving issues of laws and regulations or any other relevant issues.

Therefore, future studies can be done keeping the ever changing environmental context and can consider new constructs to be added to the proposed conceptual frameworks of the study. For example, while studying the adoption of MFS, some other determinants such as - convenience, knowledge ability, compatibility, etc. are not considered in this thesis. Thus, upcoming research can consider these dimensions alongside the framework under this study to conduct an empirical research on them.

The study of internet banking adoption considered existing bank account holders and tried to understand their acceptance and usage behavior. Although there is still a portion of the market which remains untapped, there are people within this demographic, willing to avail Internet Banking. This presents a new prospect of analysis among non-adopters on the factors affecting the non-adoption of internet banking. Working with additional endogenous and exogenous factors on top of the existing framework will definitely build on its robustness.

The thesis observed that, in recent times, any large or medium size business organization may want to integrate all the three sub segments, MFS, Internet Banking and Online Marketplace, in

one framework to support their e-commerce adaption for their business growth. Though this thesis has studied the adoption factors of these three sub segments separately keeping the Bangladeshi context in mind, the three proposed conceptual frameworks can be combined into one single model to address the above mentioned issue of the large organizations. Because the frameworks have common constructs and the relationship among the variables are also similar in nature. Therefore, in future, a study can be done by integrating the constructs of the three frameworks into a single conceptual model to be used for the large businesses.

The thesis also identified three important issues for the success of e-commerce sector: quality product/service offerings, efficient delivery network, and secure payment services. In Bangladesh, still majority of the consumers prefer cash on delivery over online payment. For successful adoption of e-commerce, it is necessary to encourage the customers to pay online through internet banking channels or MFS platforms instead of cash on delivery. Thus, future research can also focus on identifying issues for promoting online payment during e-commerce transactions among the individual consumers.

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A. APPENDIX A: VALIDITY AND RELIABILITY ITEMS

Table A1: Convergent Validity and Reliability of Items (Study on adoption of MFS)

Constructs	**Convergent Validity**			**Reliability**	
Items	**Loadings**	**CVE(%)**	**AVE**	**α**	**CR**
	>.40	**--**	**>.50**	**>.70**	**>.70**
Value Perception		**22.50**	**.557**	**.830**	**0.833**
Using mobile payment services increases my productivity in managing personal finances.	**.891**				
Using mobile payment services enhances my effectiveness in managing personal finances.	**.676**				
Using mobile payment service is useful in managing personal finances.	**.661**				
Using mobile payment service improves my performance in managing personal finances.	**.652**				
Perceived Ease of Use		**34.24**	**.523**	**.807**	**0.811**
I would find the mobile payment easy to use.	**.847**				
Learning to use mobile payment is easy for me.	**.762**				
My interaction with mobile payment procedure would be clear and understandable.	**.691**				
I would find a mobile payment procedure to be flexible to interact with.	**.523**				
Perceived Risk		**40.03**	**.633**	**.826**	**0.836**
The risk of abuse of usage information (e.g., payment amount) is low when using mobile payment service.	**.892**				
The risk of abuse of billing information (e.g., credit card number, bank account data) is low when using mobile payment service.	**.867**				
The risk of unforced error (Payment, Billing, Money Transfer) in transactions using mobile payment service is low.	**.654**				
Customer Satisfaction		**47.08**	**.463**	**.775**	**0.774**
Mobile Payment Service has brought my personal financial decisions in my hand and in a matter of click situations.	**.727**				
I think I did the right thing by deciding to use the mobile payment app.	**.715**				
Overall, I was satisfied with the use of the mobile payment app.	**.645**				
My experience with using the mobile payment app was satisfactory.	**.478**				
Adoption Confirmation		**51.11**	**.477**	**.712**	**0.723**
Adopting new technologies contribute to a better life.	**.816**				
Adopting new technology gives me more freedom of mobility.	**.640**				
Overall, most of my expectations from using mobile payment services were confirmed.	**.563**				
Continuance Intention		**55.00**	**.297**	**.709**	**0.675**
I think mobile payment service is taking us to a cashless society.	**.933**				

Constructs	Convergent Validity			Reliability	
Items	**Loadings**	**CVE(%)**	**AVE**	**α**	**CR**
I am habituated in using mobile payment services, I can't discontinue my use of the mobile payment services	**.641**				
Since people around me are becoming dependent on mobile technology to do things for them, I intend to continue using mobile payment service rather than discontinue its use.	**.431**				
Brand Attitude		**58.14**	**.645**	**.732**	**0.775**
My choice to use the mobile payment app was a wise one.	**.727**				
Adoption of Mobile Payment Services has become necessity part of people's day to day life.	**.720**				
Reliability **(α)** = Cornbach's Alpha, **CVE** = Cumulative Variance Explained , **AVE** = Average Variance Extracted, **MSV** = Maximum Variance Extracted, **CR** = Composite Reliability					

Table A2: Factor Correlation Matrix (Study on adoption of MFS)

Factors	**MSV**	Value	Ease	Continuance	Satisfaction	Risk	Adoption	Attitude
Value	**0.353**	***0.746***						
Ease	**0.353**	0.595***	***0.723***					
Continue	**0.264**	0.020	0.019	***0.545***				
Satisfaction	**0.387**	0.498***	0.452***	0.055	***0.680***			
Risk	**0.264**	0.119	0.192**	0.513***	0.322***	***0.796***		
Adoption	**0.215**	0.088	0.153*	0.464***	-0.010	0.355***	***0.691***	
Attitude	**0.387**	0.314***	0.414***	0.302***	0.622***	0.488***	0.194**	***0.803***
Extraction Method: *Maximum Likelihood.* Rotation Method: *Promax with Kaiser Normalization.*								
Notes: Diagonal italic figures are the square root of AVE. Significance of Correlations: * p < 0.050, ** p < 0.010, *** p < 0.001								

Table A3: Validity & Reliability Test (Study on adoption of internet banking)

Construct	**Component Matrix**	**Validity**			**Reliability**	
		FL	**AVE**	**MSV**	**α**	**CR**
Value Perception		**0.525**	**0.650**	**0.579**	**0.842**	**0.847**
Value1	0.730					
Value2	0.871					

Construct	Component Matrix	Validity			Reliability	
		FL	AVE	MSV	α	CR
Value3	0.811					
Ease of Use		**0.510**	**0.715**	**0.650**	**0.884**	**0.883**
Ease1	0.814					
Ease2	0.851					
Ease3	0.871					
Customer Service		**0.334**	**0.490**	**0.650**	**0.774**	**0.741**
CusServ1	0.749					
CusServ2	0.737					
CusServ3	0.605					
Perceived Risk		**0.515**	**0.601**	**0.272**	**0.819**	**0.819**
Risk1	0.780					
Risk2	0.760					
Risk3	0.785					
Technology Familiarity		**0.267**	**0.553**	**0.627**	**0.733**	**0.777**
TechFam1	0.856					
TechFam2	0.840					
TechFam3	0.469					
Usage Adoption		**0.417**	**0.656**	**0.783**	**0.860**	**0.851**
Adopt1	0.753					
Adopt2	0.856					
Adopt3	0.817					
Customer Satisfaction		**0.429**	**0.551**	**0.596**	**0.753**	**0.783**
Satisfy1	0.600					
Satisfy2	0.728					
Satisfy3	0.874					
Usage Continuance		**0.420**	**0.799**	**0.783**	**0.921**	**0.923**
Continue1	0.876					
Continue2	0.888					
Continue3	0.918					

B. APPENDIX B: DIFFERENT ICT INDICATORS

B1: UNCTAD B2C E-COMMERCE INDEX INDICATORS

The index consists of four indicators:

1. Account ownership at a financial institution or with a mobile-money-service provider (% of population ages 15+)
2. Individuals using the Internet (% of population)
3. Postal Reliability Index
4. Secure Internet servers (per 1 million people)

B2: ICT DEVELOPMENT INDEX (IDI) INDICATORS

The IDI is a composite index that combines 11 indicators into one benchmark measure that can be used to monitor and compare developments in ICTs between countries and over time. These 11 indicators are:

a) ICT Access
    1. Fixed-telephone subscriptions per 100 inhabitants
    2. Mobile-cellular telephone subscriptions per 100 inhabitants
    3. International Internet bandwidth (bit/s) per internet user
    4. Percentage of households with a computer
    5. Percentage of households with Internet access

b) ICT Use
    6. Percentage of individuals using the Internet
    7. Fixed-broadband subscriptions per 100 inhabitants
    8. Active mobile-broadband subscriptions per 100 inhabitants

c) ICT Skills
    9. Mean years of schooling
    10. Secondary gross enrolment ratio
    11. Tertiary gross enrolment ratio

B3: NETWORK READINESS INDEX (NRI)

The Network Readiness Index (NRI) framework consists of the following:

NRI Technology: This pillar therefore seeks to assess the level of technology that is a sine qua non for a country's participation in the global economy. The following three sub-pillars have been identified for that purpose:

- **Access**: The fundamental level of ICT in countries, including on issues of communications infrastructure and affordability.

- **Content**: The type of digital technology produced in countries, and the content/applications that can be deployed locally.

- **Future Technologies**: The extent to which countries are prepared for the future of the network economy and new technology trends such as artificial intelligence (AI) and Internet of Things (IoT).

NRI people: The availability and level of technology in a country is only of interest insofar as its population and organizations have the access, resources, and skills to use it productively. This pillar is therefore concerned with the application of ICT by people at two levels of analysis: individuals, businesses.

- Individuals: How individuals use technology and how they leverage their skills to participate in the network economy.
- Businesses: How businesses use ICT and participate in the network economy.

NRI governance: A country's network readiness does not take place in a vacuum and is a function of the national context within which people operate. Thus, this pillar seeks to capture how conducive the national environment is for a country's participation in the network economy, based on issues of trust, regulation, and inclusion.

C. APPENDIX C: LIST OF CONSTRUCTS

Table C1: List of constructs to study the adoption of mobile financial services

Construct	Items
Perceived Value (Value)	1. Using mobile payment services increases my productivity in managing personal finances (PerceivedValue_2) 2. Using mobile payment services enhances my effectiveness in managing personal finances (PerceivedValue_3) 3. Using mobile payment service is useful in managing personal finances. (PerceivedValue_4) 4. Using mobile payment service improves my performance in managing personal finances (PerceivedValue_1)
Perceived Ease of Use (Ease)	5. I would find the mobile payment easy to use (Perceived_EaseUse_4) 6. My interaction with mobile payment procedure would be clear and understandable (Perceived_EaseUse_2) 7. It would be easy for me to become skillful at using the mobile payment (Perceived_EaseUse_3) 8. I would find a mobile payment procedure to be flexible to interact with (Perceived_EaseUse_5)
Continuance Intention (Continue)	9. (ContinuanceIntention_6) 10. My intentions are to continue using mobile payment services (ContinuanceIntention_5) 11. I think mobile payment service is taking us to a cashless society (ContinuanceIntention_4) 12. I am habituated in using mobile payment services, I can't discontinue my use of the mobile payment services (ContinuanceIntention_2) 13. Since people around me are becoming dependent on mobile technology to do things for them, I intend to continue using mobile payment service rather than discontinue its use (ContinuanceIntention_3)
Customer Satisfaction (Satisfaction)	14. My experience with using the mobile payment app was satisfactory (CustomerSatisfaction_3) 15. Adoption of Mobile Payment Services has become necessity part of people's day to day life (CustomerSatisfaction_2) 16. Mobile Payment Service has brought my personal financial decisions in my hand and in a matter of click situations (CustomerSatisfaction_4) 17. My choice to use the mobile payment app was a wise one (CustomerSatisfaction_1)
Perceived Risk (Risk)	18. The risk of abuse of usage information (e.g., payment amount) is low when using mobile payment service (PerceivedRisk_2) 19. The risk of an unauthorized party intervening in the mobile payment process is low (PerceivedRisk_1) 20. The risk of abuse of billing information (e.g., credit card number, bank account data) is low when using mobile payment service. (PerceivedRisk_3)
Adoption Confirmation (Adoption)	21. My experience with using mobile payment service was better than what I expected. (AdoptionConfirmation_4) 22. The service level provided by the mobile payment service providers was better than what I expected. (AdoptionConfirmation_5) 23. Overall, most of my expectations from using mobile payment services

Construct	Items
	were confirmed (AdoptionConfirmation_3)
Brand Attitude (Attitude)	24. I use mobile payment services to make purchases. (BrandAttitude_2) 25. I enjoy purchasing products via mobile payment services. (BrandAttitude_1)

Table C2: List of Constructs to study the adoption of internet banking

Construct	Items
Value Perception (Value)	1. Using Internet Banking gives me more options in banking (Value1) 2. Using Internet Banking saves me time (Value2) 3. Internet Banking brings various banking services at the palm of my hands (Value3)
Ease of Use (Ease)	4. Learning to use internet banking was easy for me (Ease1) 5. I find internet banking application(s) easy to use (Ease2) 6. Internet Banking makes it easy for me to make transactions (Ease3)
Customer Service (CusServ)	7. Internet Banking allows me to get 24/7 service (CS1) 8. My bank provides excellent Internet Banking services (CS2) 9. My bank resolves internet banking related complains within my level of tolerance (CS3)
Perceived Risk (Risk)	10. The risk of exposing account information is low (Risk1) 11. The risk of transactions failing is low (Risk2) 12. The internet banking platform is secured enough to make me feel comfortable (Risk3)
Technology Familiarity (TechFam)	13. I know how to use financial technology like bKash, Rocket, Nagad, etc. (TF1) 14. I know how to use mobile application-based services like Uber, Pathao, Sheba xyz, Bioscope etc. (TF2) 15. I follow technology experts to stay up to date with the latest trends (TF3)
Usage Adoption (Adopt)	16. I feel the need to use the latest financial technology, like internet banking (Adopt1) 17. Using new technologies like Internet Banking has improved my life (Adopt2) 18. I prefer internet banking over going to branch, for making transactions (Adopt3)
Customer Satisfaction (Satisfy)	19. Internet banking allows me to avail all my desired banking services (Satisy1) 20. I feel satisfied using my internet banking application (Satisfy2) 21. I feel that I made the right decision to avail internet banking (Satisfy3)
Usage Continuance (Continue)	22. In the near future, I will use more cashless payment services like internet banking (Cont1) 23. I am habituated with using financial technology like Internet Banking (Cont2) 24. I will continue using Internet Banking services (Cont3)

Table C3: List of Constructs to study the adoption of online marketplace

Construct	Items
Value Perception (Value)	1. Using E-Commerce gives me more options (Value1) 2. Using E-Commerce saves me time (Value2) 3. E-Commerce brings various services at the palm of my hand (Value3) 4. Using E-Commerce saves me money (Value4) 5. E-commerce platforms help me find product easily (Value5) 6. Technologies like E-commerce made my life easy (Value6)
Ease of Use (Ease)	7. Learning to use E-Commerce was easy for me (Ease1) 8. I find E-Commerce easy to use (Ease2) 9. E-commerce is easy for me to make transactions (Ease3)
Customer Service (CusServ)	10. E-Commerce allows me to get 24/7 service (CS1) 11. E-Commerce companies in Bangladesh provide excellent services (CS2) 12. E-Commerce companies in Bangladesh resolve complaints within my desired time (CS3) 13. E-Commerce companies in Bangladesh take return instantly if I don't like the product (CS4)
Perceived Risk (Risk)	14. The risk of misuse of personal data is low (Risk1) 15. I believe that the ecommerce company will keep my financial information secure (Risk2) 16. I believe that there is no risk related to product non delivery (Risk3) 17. I believe that there is no hacking risk related to my personal data (Risk)
Trust (Trst)	18. I believe that the products ordered will match the descriptions (Trst1) 19. I believe that the products that I receive are not fakes (Trst2) 20. I believe that the products that I receive will be damaged (Trst3)
Usage Adoption (Adopt)	21. I use E-Commerce platforms for its useful features (Adopt1) 22. I prefer E-Commerce platforms over retail stores (Adopt2) 23. I believe that people will use e-commerce platforms if desired service is ensured (Adopt3) 24. I believe that people will use e-commerce platforms as the platforms are easy to use
Customer Satisfaction (Satisfy)	25. I feel satisfied with my E-Commerce experiences (Satisy1) 26. I feel that I made the right decision to avail E-Commerce services (Satisfy2) 27. Using ecommerce platform is now a necessary part of my day to day life (Satisfy3) 28. I always get expected services while purchasing from ecommerce platforms (Satisfy4)
Usage Continuance (Continue)	29. I am habituated with using E-Commerce services (Cont1) 30. I will continue to use E-Commerce services (Cont2) 31. I will increase the use of E-Commerce services in the future (Cont3)

D. APPENDIX D: LIST OF FGD AND DEPTH INTERVIEW PARTICIPANTS

D1: List of participants in FGD on e-commerce adoption

1) Mr. A. K. M. Fahim Mashroor, Founder & CEO, Bdjobs.com
2) Mr. Rezwanul Haq Jamee, Head of e-commerce, Aspire to Innovate (A2i), ICT Division, Government of Bangladesh
3) Mr. Abdul Wahed Tomal, General Secretary, e-commerce Consumer Association of Bangladesh (e-CAB)
4) Mr. Sadruddin Imran, Chairman & CEO, Innovision Consulting Private Ltd.
5) Mr. Biplob G. Rahul, Founder & CEO, eCourier Ltd.
6) Mr. Rubayat bin Arif, Director, Kloud Technologies Ltd.
7) Mr. Asish Chakrobarty, COO, SSLCOMMERZ

D2: List of participants in FGD on internet banking adoption

1) Mr. Nazmur Rahim, Head of Alternate Banking Channels, BRAC Bank Limited
2) Mr. Golam Yeazdani, Head of Internet Banking, The City Bank Limited
3) Mr. ABM Rezaul Hasan, Head of Risk and Control, Standard Chartered Bank Limited
4) Mr. Amin Md. Mehedi Hasan, Head of Digital Banking Channels, Eastern Bank Limited
5) Mr. Akil Afzal, Head of Alternate Delivery Operations, IFIC Bank Limited

D3: List of participants in FGD on adoption of online marketplace

1) Mr. Mohammad Riyad Hossain, CHRO, Daraz Bangladesh Ltd.
2) Ms. Monjuri Mallik, Director, Technology, Digital Payment and Strategy, Daraz Bangladesh Ltd.
3) Ms. Farhana Rafiq Uzzaman, Chief Customer Officer, Daraz Bangladesh Ltd.
4) A H M Hasinul Quddus, Chief Corporate Affairs Officer, Daraz Bangladesh Ltd.

D4: List of depth interview participants

1. Mr. Kamal S. Quadir, CEO, bKash
2. Mr. Irfan Patowary, Risk & Fraud Specialist, foodpanda
3. Mr. A. T. M. Shamim Uz Zaman, Head of Brands, Robi Axiata Ltd.
4. Mr. Akif Ahmed, Managing Director, Navigators' Solutions Ltd.

E. APPENDIX E: SURVEY QUESTIONNAIRES

E1: ADOPTION OF MFS

Dear respondent,

Thank you for your willingness to complete the survey. The purpose of the survey is to investigate consumers' adoption and continuance of using mobile payment services such as bKash, Rocket, U-Cash, M-Cash, etc. to transfer money, purchase products and services, and make payments. The questionnaire contains two sections and should take not more than 10 minutes to complete. It is an anonymous and confidential survey. Your response will solely be used for research purpose.

Regards.

Md. Iftekharul Amin

PhD Researcher

Institute of Information Technology (IIT), University of Dhaka

SECTION A: CUSTOMER DEMOGRAPHICS, PRODUCTS PURCHASED, AND APPS USED

This section contains questions relating to your familiarity with and use of existing mobile payment apps in Bangladesh. Please answer the following questions by choosing the appropriate option(s).

A1: Screening questions

Are you 18 years older?	Yes	No
Have you downloaded or used any mobile payment applications such as bKash, Rocket, U-Cash, M-Cash, etc.?	Yes	No

If you answer "Yes" to all questions above, please complete the questionnaire.

If you answer "No" to any of the questions above, you do not have to complete the questionnaire. Thank you for your willingness to participate.

1. Your gender: □ Male □ Female

2. Your Age (in Years):

□ < 20 □ 20–30 □ 30–40 □ 40–50 □ 50 – 60 □ 60+

3. What is your highest level of education?

□ Primary □ SSC □ HSC □ Graduate □ Postgraduate

4. Please indicate the mobile payment app that you use (*You may choose more than one)*

□ bKash (BRAC Bank Limited) □ Rocket (Dutch Bangla Bank Limited ;DBBL)

□ UCash (United Commercial Bank Limited) □ My Cash (Mercantile Bank Limited)

□ M-Cash (Islami Bank Bangladesh Limited) □ OK Mobile (One Bank Limited)

□ Sure Cash (Rupali Bank Limited) □ Others…….

5. How long have you been using Mobile Financial Services (MFS)?

□ Less than 1 year □ 1-3 years □ 3-5years □over 5 years

6. How often do you use Mobile Financial Services (MFS)?

□ Daily □ Thrice a Week □ Once a Week □ Once in Two Weeks □ Monthly □ Seldom

7. Please indicate the type of product/service that you usually buy using your mobile payment app. (*You may choose more than one option)*

- Cash In & Out (Money Transfer)
- Mobile Recharge (Top Up)
- Shopping Payment (Restaurant Payment, Supermarket Payment, Store Payment, etc.)
- Bill Payment (Electricity Bill, Water Bill, Gas Bill, Medical Bill, Tuition Fee, etc.)
- P2P (Person-to-person payments (P2P); Transfer funds from individuals bank account or credit card to another individual's account)

8. Your Place of Residence?

□Urban (Divisional/District Town) □ Semi-Urban (Union/Upazilla) □ Rural (Village)

9. Your Region (Division)?

□Dhaka □Chattogram □Rajshahi □Khulna □Barishal □Sylhet □Rangpur □Mymensingh

10. Your Monthly Income Level

□ Below 5,000 Tk □ 5,001-10,000 Tk □ 10,001-20,000 Tk

□ 20,001-40,000 Tk □ 40,001-60,000 Tk □ 60,001-1,00,000 Tk

□ Above 1,00,000 TK

11. **Your Occupation**

- Service Holder
- Specialized Professional
- Businessman
- Retired
- Housewife
- Student
- Casual Laborer (Garments Worker, Day Labor, etc.)
- Remittance Earners
- Teacher
- Others……..

<u>SECTION B:</u> ADOPTION, SATISFACTION, AND CONTINUANCE INTENTIONS TO USE MOBILE FINANCIAL SERVICES

Please answer this section by indicating the extent to which you agree or disagree with the following statements on a scale of 1 to 5 where 1 is "strongly disagree" and 5 is "strongly agree".

Continuance Intention	**SD (1)**	**D (2)**	**NAD (3)**	**A (4)**	**SA (5)**
My intentions are to continue using mobile payment services					
I am habituated in using mobile payment services, I can't discontinue my use of the mobile payment services					
Since people around me are becoming dependent on mobile technology to do things for them, I intend to continue using mobile payment service rather than discontinue its use.					
I think mobile payment service is taking us to a cashless society.					
Adoption confirmation	**SD (1)**	**D (2)**	**NAD (3)**	**A (4)**	**SA (5)**
My experience with using mobile payment service was better than what I expected.					
The service level provided by the mobile payment service providers was better than what I expected.					
Overall, most of my expectations from using mobile payment services were confirmed.					
Technological Optimism	**SD (1)**	**D (2)**	**NAD (3)**	**A (4)**	**SA (5)**
New technologies contribute to a better life.					
Technology gives me more freedom of mobility.					
Technology gives people more control over their lives.					
Technology makes me more productive in my personal life.					
Innovativeness	**SD (1)**	**D (2)**	**NAD (3)**	**A (4)**	**SA (5)**
Other people come to me for advice on new mobile technologies.					
In general, I am among the first in my friends circle to acquire new technology when it appears.					
I can easily figure out new high-tech mobile technologies without help from others.					
I keep up with the latest mobile technological developments in areas of interest.					
Knowledge	**SD (1)**	**D (2)**	**NAD (3)**	**A (4)**	**SA (5)**
I enjoy purchasing products via mobile payment services.					
I use mobile payment services to make purchases.					
I mostly use mobile payment service when purchasing goods or services via mobile phone.					
I would be confident to use mobile payment services for financial transactions.					
Convenience	**SD (1)**	**D (2)**	**NAD (3)**	**A (4)**	**SA (5)**
Mobile payment is convenient because the phone is usually with me.					
Mobile payment is convenient because I can use it anytime.					
Mobile payment is convenient because I can use it in any situation.					

Mobile payment is convenient because it is not a complex process.					
Compatibility	**SD (1)**	**D (2)**	**NAD (3)**	**A (4)**	**SA (5)**
Using mobile payment apps are compatible with my lifestyle.					
When there are technical supports available from a mobile payment service provider, I can adjust in any situation.					
Using mobile payment apps fits well with the way I like to purchase products and services.					
I appreciate using mobile payment apps instead of alternative modes of payment (e.g., credit card, cash).					
Discomfort	**SD (1)**	**D (2)**	**NAD (3)**	**A (4)**	**SA (5)**
Technical support lines are not helpful because they don't explain things in terms I understand.					
Sometimes, I think that mobile technology services are not designed for use by ordinary people.					
There is no such thing as a manual for high-tech mobile phones that is written in plain language.					
Insecurity	**SD (1)**	**D (2)**	**NAD (3)**	**A (4)**	**SA (5)**
Too much use of technology make people act unconsciously.					
Technology lowers the quality of relationships by reducing personal interaction.					
I do not feel confident doing business by a mobile phone with individuals in a remote place.					
Perceived Cost	**SD (1)**	**D (2)**	**NAD (3)**	**A (4)**	**SA (5)**
The fee that I pay for the use of mobile payment service is too high.					
The fee that I have to pay for the mobile payment service is reasonable.					
I am pleased with the fee that I have to pay for the use of mobile payment service.					
Perceived Risk	**SD (1)**	**D (2)**	**NAD (3)**	**A (4)**	**SA (5)**
The risk of an unauthorized party intervening in the mobile payment process is low.					
The risk of abuse of usage information (e.g., payment amount) is low when using mobile payment service.					
The risk of abuse of billing information (e.g., credit card number, bank account data) is low when using mobile payment service.					
The risk of unforced error (Payment, Billing, Money Transfer) in transactions using mobile payment service is low.					
Customer Satisfaction	**SD (1)**	**D (2)**	**NAD (3)**	**A (4)**	**SA (5)**
My choice to use the mobile payment app was a wise one.					
Adoption of Mobile Payment Services has become necessity part of people's day to day life.					

My experience with using the mobile payment app was satisfactory.					
Mobile Payment Service has brought my personal financial decisions in my hand and in a matter of click situations.					
I think I did the right thing by deciding to use the mobile payment app.					
Overall, I was satisfied with the use of the mobile payment app.					
Perceived Value	**SD (1)**	**D (2)**	**NAD (3)**	**A (4)**	**SA (5)**
Using mobile payment service improves my performance in managing personal finances.					
Using mobile payment services increases my productivity in managing personal finances.					
Using mobile payment services enhances my effectiveness in managing personal finances.					
Using mobile payment service is useful in managing personal finances.	**SD (1)**	**D (2)**	**NAD (3)**	**A (4)**	**SA (5)**
Perceived Ease of Use					
Learning to use mobile payment is easy for me.					
My interaction with mobile payment procedure would be clear and understandable.					
It would be easy for me to become skillful at using the mobile payment.					
I would find the mobile payment easy to use.					
I would find a mobile payment procedure to be flexible to interact with.					

Thank you for taking time to complete this survey

E2: ADOPTION OF INTERNET BANKING

Dear respondent,

Greetings! Thank you for deciding to take part in this survey. The purpose of the survey is to understand the Internet Banking adoption factors of the existing bank customers of Bangladesh. I sincerely appreciate your effort and time to participate in this survey. The questionnaire contains four sections and should take not more than 10 minutes to complete. It is an anonymous and confidential survey. Your response will solely be used for research purpose.

Md. Iftekharul Amin

PhD Researcher

Institute of Information Technology (IIT), University of Dhaka

Section A: General Banking Habits

1. In which Bank do you have an account? (Select more than one, if applicable)
   - ☐List of all 60 (registered) banks
2. Type of Bank Account (Select more than one, if applicable)
   - ☐Savings Account
   - ☐Salary Account
   - ☐Current Account
   - ☐Term Deposit Account (e.g. FDR, DPS, etc.)
   - ☐Credit Card
   - ☐Loan Amount
3. Does the bank in which you most frequently maintain provide Internet Banking Services?
   - ☐Yes
   - ☐No
   - ☐Not sure
4. Do you use internet banking?
   - ☐Yes
   - ☐No

Section B – Part 1: Internet Banking Habits *(For Answer "Yes" on Question No. 4)*

5. Which platform(s) do you use for Internet Banking?
   - ☐Website-based
   - ☐Mobile Application-based
   - ☐Both
6. How frequently do you use Internet Banking (web or app-based) per month?
   - ☐Never
   - ☐Rarely (Once every 3-4 months)
   - ☐1-3 times
   - ☐4-6 times
   - ☐7-9 times

☐10-12 times

☐Over 12 times

7. Value Perception:

Please Select to what extent you agree or disagree with the following statements:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Using Internet Banking gives me more options in banking					
Using Internet Banking saves me time					
Internet Banking brings various banking services at the palm of my hands					

8. Ease of Use:

Please Select to what extent you agree or disagree with the following statements:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Learning to use internet banking was easy for me					
I find internet banking application(s) easy to use					
Internet Banking makes it easy for me to make transactions					

9. Customer Service:

Please Select to what extent you agree or disagree with the following statements:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Internet Banking allows me to get 24/7 service					
My bank provides excellent Internet Banking services					
My bank resolves internet banking related complains within my level of tolerance					

10. Perceived Risk:

Please Select to what extent you agree or disagree with the following statements:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The risk of exposing account information is low					
The risk of transactions failing is low					
The internet banking platform is secured enough to make me feel comfortable					

11. Technology Familiarity:

Please Select to what extent you agree or disagree with the following statements:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I know how to use financial technology like bKash, Rocket, Nagad, etc.					
I know how to use mobile application based services like Uber, Pathao, sheba xyz, Bioscope etc.					
I follow technology experts to stay upto date with the latest trends					

12. Usage Adoption:

Please Select to what extent you agree or disagree with the following statements:

	Strongly	Disagree	Neutral	Agree	Strongly

	Disagree				Agree
I feel the need to use the latest financial technology, like internet banking					
Using new technologies like Internet Banking has improved my life					
I prefer internet banking over going to branch, for making transactions					

13. Customer Satisfaction:

Please Select to what extent you agree or disagree with the following statements:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Internet banking allows me to avail all my desired banking services					
I feel satisfied using my internet banking application(s)					
I feel that I made the right decision to avail internet banking					

14. Usage Continuance:

Please Select to what extent you agree or disagree with the following statements:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
In the near future, I will use more cashless payment services like Internet Banking					
I am habituated with using financial technology like Internet Banking					
I will continue using Internet Banking services.					

Section C – Part 2: Non-adoption of Internet Banking *(For Answer "No" on Question No. 4)*

15. Why aren't you using Internet Banking? (You may choose more than one, if applicable)

☐Lack of proper internet access

☐Needs lot of technical knowledge

☐Time consuming

☐Not user friendly

☐Additional service charge

☐Lack of appropriate device(s) (e.g. smartphone, tab, laptop, etc.)

☐Lack of promotional activities from my bank

☐Fear of Password/OTP getting stolen

☐Fear of Account Information stolen

☐Fear of Unauthorized Transactions

☐Risk of losing all my money

☐Not Available

☐Other _____

16. What will make you want to use Internet Banking? (You may choose more than one, if applicable)

☐Easy Online Video Tutorials

☐Guarantee of Secured Transactions

☐More User-Friendly Application Design

☐Faster/More Responsive Application

☐Lower service charge
☐Legal Backing by Bank during Fraudulent Transactions
☐I won't use Internet Banking
☐I'll use Internet Banking if my bank launches in the future
☐Other _____

Section D: General Information/Demographic Details

17. Which region/division do you live in?
    ☐Dhaka
    ☐Chattogram
    ☐Rajshahi
    ☐Khulna
    ☐Barishal
    ☐Sylhet
    ☐Rangpur
    ☐Mymensingh
18. Highest level of Education
    ☐Primary Schooling (till Class 5)
    ☐Secondary Schooling (till Class 10)
    ☐SSC/ O Levels
    ☐HSC/ A Levels
    ☐Diploma
    ☐Bachelor's Degree
    ☐Master's Degree
    ☐M.Phil
    ☐Ph.D
    ☐Postdoc.
19. Occupation
    ☐Government Service
    ☐Private Service Holder
    ☐Businessman
    ☐Specialized Professional (e.g. teacher, doctor, military officer, etc.)
    ☐Student
    ☐Homemaker
    ☐Retired Personnel
    ☐Remittance Earner
    ☐Unemployed
    ☐Entrepreneur
20. Unemployed Monthly income
    ☐Below BDT 10,000
    ☐BDT 10,001-20,000
    ☐BDT 20,001-30,000

☐BDT 30,001-40,000
☐BDT 40,001-50,000
☐BDT 50,001-60,000
☐BDT 60,001-70,000
☐BDT 70,001-80,000
☐BDT 80,001-90,000
☐BDT 90,001-100,000
☐More than BDT 100,000

21. Gender
    ☐Male
    ☐Female
    ☐Other
22. Age: (NUMERICAL INPUT)

Thank you!

E3: ADOPTION OF ONLINE MARKETPLACE

Dear respondent,

Greetings! Thank you for deciding to take part in this survey. The purpose of the survey is to understand the online marketplace (daraz, jadro, shazgoj, eyc.) adoption factors of individual consumers of Bangladesh. I sincerely appreciate your effort and time to participate in this survey. The questionnaire contains three sections and should take not more than 10 minutes to complete. It is an anonymous and confidential survey. Your response will solely be used for research purpose.

Md. Iftekharul Amin

PhD Researcher

Institute of Information Technology (IIT), University of Dhaka

Section 1: Use of E-Commerce Services in Bangladesh

Q. Have you ever used any B2C E-Commerce services in Bangladesh? (আপনি কি ইকমার্স এর মাধ্যমে কেনাকাটা করেছেন?)

- ○ Yes (হ্যাঁ)
- ○ No (না)

Q. If yes, which B2C E-Commerce services have you used? করলে কোন কোন সাইট ব্যবহার করেছেন ?

○ Daraz	○ Bagdoom	○ Othoba
○ Pickaboo	○ Priyoshop	○ Others _____

Q. Which platform(s) have you used for the E-Commerce services? (কোন প্লাটফর্ম থেকে ইকমার্স ব্যবহার করেন?)

- ○ Website Based (ওয়েব ভিত্তিক)
- ○ Mobile Application Based (অ্যাপ ভিত্তিক)
- ○ Both (উভয়ই)

Q. How frequently do you use E-Commerce Services per month? প্রতি মাসে কয় বার ইকমার্স ব্যবহার করেন?

○ 0-1 times (০-১ বার)	○ 4-6 times (৪-৬ বার)	○ More than 9 time (৯ বারের বেশি)
○ 1-3 times (১-৩ বার)	○ 7-9 times (৭-৯ বার)	

Section 2: E-Commerce Adoption Factors

Q. Perceived Value: Please select to what extent you agree or disagree with the following statements:

	একদম একমত নই	একমত নই	নিরপেক্ষ	একমত	পুরোপুরি একমত
Using E-Commerce gives me more options ইকমার্স ব্যবহার করলে পণ্যর অনেক বেশি অপশন পাওয়া যায়					
Using E-Commerce saves me time ইকমার্স ব্যবহার করলে সময় সাশ্রয় হয়					
E-Commerce brings various services at the palm of my hand. ইকমার্স অনেক নতুন সেবাকে হাতের নাগালে নিয়ে এসেছে					
Using E-Commerce saves me money ইকমার্স ব্যবহার করলে অর্থ সাশ্রয় হয়					
E-commerce platforms help me find product easily					

ইকমার্স ব্যবহার করলে পণ্য অনেক সহজে পাওয়া যায়					
Technologies like E-commerce made my life easy ইকমার্সএর মত প্রযুক্তি আমাদের জীবন সহজ করেছে					

Q. Ease of Use: Please select to what extent you agree or disagree with the following statements:

	একদম একমত নই	একমত নই	নিরপেক্ষ	একমত	পুরোপুরি একমত
Learning to use E-Commerce was easy for me ইকমার্স ব্যবহার শেখা আমার জন্য সহজ ছিল					
I find E-Commerce easy to use. ইকমার্স ব্যবহার করা আমার জন্য সুবিধাজনক					
E-commerce is easy for me to make transactions ইকমার্স ব্যবহার করে সহজে লেনদেন করা যায়					

Q. Customer Service: Please select to what extent you agree or disagree with the following statements:

	একদম একমত নই	একমত নই	নিরপেক্ষ	একমত	পুরোপুরি একমত
E-Commerce allows me to get 24/7 service. ইকমার্স ব্যবহার করলে ২৪/৭ সেবা পাওয়া যায়					
E-Commerce companies in Bangladesh provide excellent services. ইকমার্স কোম্পানি বাংলাদেশে খুব ভাল গ্রাহক সেবা দেয়					
E-Commerce companies in Bangladesh resolve complaints within my desired time বাংলাদেশের ইকমার্স কোম্পানিগুলি আমার অভিযোগ সময়ের মধ্যই সমাধান করে					
E-Commerce companies in Bangladesh take return instantly if I don't like the profuct অর্ডার করা পণ্য পছন্দ না হলে ইকমার্স কোম্পানিগুলি তাৎক্ষনিক পণ্য ফেরত নেয়					

Q. Perceived Risk: Please select to what extent you agree or disagree with the following statements:

	একদম একমত নই	একমত নই	নিরপেক্ষ	একমত	পুরোপুরি একমত
The risk of misuse of personal data is low ব্যক্তিগত তথ্যএর অপব্যবহারের সম্ভাবনা কম					
I believe that the ecommerce company will keep my financial information secure. আমি বিশ্বাস করি ইকমার্স কোম্পানি আমার আর্থিক তথ্য সুরক্ষিত রাখবে					
I believe that there is no risk related to product non delivery আমি বিশ্বাস করি অর্ডার করা পণ্য ডেলিভারি পাওয়া নিয়ে কোন ঝুঁকি নাই					
I believe that there is no hacking risk related to my personal data আমি বিশ্বাস করি ইকমার্স কোম্পানি থেকে আমার ব্যক্তিগত তথ্য হ্যাক হওয়ার ঝুঁকি নাই					

Q. Trust: Please select to what extent you agree or disagree with the following statements:

	একদম একমত নই	একমত নই	নিরপেক্ষ	একমত	পুরোপুরি একমত
I believe that the products ordered will match the descriptions. আমি বিশ্বাস করি অর্ডার করা পণ্য আর ডেলিভারি দেয়া পণ্য একই হবে					
I believe that the products that I receive are not fakes.					

আমি বিশ্বাস করি ডেলিভারি দেয়া পণ্য নকল হবে না					
আমি বিশ্বাস করি অর্ডার করা পণ্য নিখুঁতভাবে ডেলিভারি দেয়া হবে I believe that the products that I receive will be damaged					

Q. Usage Adoption: Please select to what extent you agree or disagree with the following statements:

	একদম একমত নই	একমত নই	নিরপেক্ষ	একমত	পুরোপুরি একমত
I use E-Commerce platforms for its useful features. ইকমার্স প্লাটফর্মের সুবিধাজনক বৈশিষ্টের জন্য আমি তা ব্যবহার করি					
I prefer E-Commerce platforms over retail stores. আমি খুচরা দোকান থেকে ইকমার্স প্লাটফর্ম বেশি পছন্দ করি					
I believe that people will use e-commerce platforms if desired service is ensured আমি বিশ্বাস করি প্রত্যাশিত সেবা পেলে সবাই ইকমার্স প্লাটফর্ম ব্যবহার করবে					
I believe that people will use e-commerce platforms as the platforms are easy to use আমি বিশ্বাস করি ইকমার্স প্লাটফর্ম ব্যবহার সহজ বলে সবাই তা ব্যবহার করবে					

Q. Customer Satisfaction: Please select to what extent you agree or disagree with the following statements:

	একদম একমত নই	একমত নই	নিরপেক্ষ	একমত	পুরোপুরি একমত
I feel satisfied with my E-Commerce experiences. আমার ইকমার্স ব্যবহারের অভিজ্ঞতা নিয়ে আমি সন্তুষ্ট					
I feel that I made the right decision to avail E-Commerce services. আমি মনে করি আমার ইকমার্স ব্যবহারের সিধান্তটি সঠিক					
Using ecommerce platform is now a necessary part of my day to day life ইকমার্স সেবা ব্যবহার আমার দৈনন্দিন জীবনের একটি নিত্যপ্রয়োজনীয় বিষয়					
I always get expected services while purchasing from ecommerce platforms ইকমার্স সেবা ব্যবহার কেনাকাটার সময় আমি সবসময় কাঙ্ক্ষিত সেবা পাই					

Q. Usage Continuance: Please select to what extent you agree or disagree with the following statements:

	একদম একমত নই	একমত নই	নিরপেক্ষ	একমত	পুরোপুরি একমত
I am habituated with using E-Commerce services. ইকমার্স ব্যবহার করে আমি অভ্যস্ত					
I will continue to use E-Commerce services. আমি ইকমার্স ব্যবহার করতে থাকব					
I will increase the use of E-Commerce services in the future. আমি আগামীতে আরও বেশি ইকমার্স ব্যবহার করব					

Section 3: Personal Information

Q. Where do you live? আপনার বর্তমান অবস্থান কোন বিভাগে

- Dhaka (ঢাকা)
- Rajshahi (রাজশাহী)
- Barishal (বরিশাল)
- Rangpur (রংপুর)
- Chattogram (চট্টগ্রাম)
- Khulna (খুলনা)
- Sylhet (সিলেট)
- Mymensingh (ময়মনসিংহ)

Q. What is your highest level of education? শিক্ষাগত যোগ্যতা

SSC/O Levels মধ্যমিক HSC/A Levelsঃ উচ্চ মাধ্যমিক

Bachelor's Degree স্নাতক Master's Degree স্নাতকোত্তর

Q. What is your occupation? পেশা

Businessman ব্যবসা Private Service Holderবেসরকারি চাকুরিজীবি Government Service Holder সরকারি চাকুরি

Student ছাত্র Homemaker হোম মেকার Other অন্যান্য

Q. What is your monthly Income/ allowance range? মাসিক আয়

২০০০০ টাকা এর নিচে ৪০০০০-৬০০০০ টাকা ৮০,০০০-১০০,০০০ টাকা

২০,০০০- ৪০,০০০ টাকা ৬০০০০-৮০০০০ টাকা ১০০,০০০ টাকার বেশি

Q. Which gender do you identify with?

○ Male পুরুষ	○ Female মহিলা	○ Other অন্যান্য

Q. What is your age? বয়স

- ○ Less than 20 ২০ এর কম
- ○ 20 – 30 ২০-৩০
- ○ 30 – 40 ৩০-৪০
- ○ 40 – 50 ৪০-৫০
- ○ 50 – 60 ৫০-৬০
- ○ More than 60 ৬০ এর বেশি

Thank you!