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Internet Banking in Bangladesh: Trust, User Acceptance and Market Penetration

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Foreword

As part of the ongoing dissemination of BIBM research outputs, the present research monograph contains the findings of the research project: "Internet Banking in Bangladesh: Trust, User Acceptance and Market Penetration". Banking institutions invest heavily in information technology and efficient information systems to upgrade business processes and strategies with the aim of gaining competitive advantage. Alternative Delivery Channels (ADCs) like Internet Banking, ATM, Agent Banking, MFS, and Apps Banking are gaining popularity in the banking domain. However, beyond all technologies, Internet Banking is the most powerful real-time online banking with the least cost. An Internet Banking account is simple to open and easy to operate. It is convenient because customers can easily pay any kind of bill without standing in a long queue and transfer funds between accounts from nearly anywhere in the world. The research ascertains some essential factors that are related to trust, user acceptance, and market penetration in Internet Banking. This publication also identifies the challenges of internet banking and suggests future courses of action in ensuring better and secured internet banking services of banks.

It gives me immense pleasure, on behalf of BIBM, to offer this important and resourceful academic inputs to the practitioners of the banks and financial institutions, regulatory agencies as well as to the academics and common readers. I hope, this monograph will be a valuable resource for new generation banking professionals for better understanding of the trust, user acceptance and market penetration in Internet Banking activities of banks in Bangladesh.

We do encourage feedback from our esteemed readers on this issue which certainly would help us to improve our research activities in the years to ahead.

Dr. Md. Akhtaruzzaman
Director General, BIBM

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Internet Banking in Bangladesh: Trust, User Acceptance and Market Penetration

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Abbreviations

ADC	Alternative Delivery Channel
ATM	Automated Teller Machine
BACH	Bangladesh Automated Clearing House
BB	Bangladesh Bank
BEFTN	Bangladesh Electronic Funds Transfer Network
BIBM	Bangladesh Institute of Bank Management
CAGR	Compound Annual Growth Rate
CAPTCHA	Completely Automated Public Turing test to tell Computers and Humans Apart
CCA	Credit Card Account
CCTV	Closed-Circuit Television
CIB	Credit Information Bureau
COVID-19	Coronavirus Disease-2019
CVV	Card Verification Value
DDoS	Distributed Denial of Service
DNS	Domain Name System
DoS	Denial of Service
DPS	Deposit Pension Scheme
E-commerce	Electronic Commerce
EDM	Electronic Direct Mail
e-KYC	Electronic Know Your Customer
FCB	Foreign Commercial Bank
f-commerce	Facebook Commerce
FDA	Fixed Deposit Account
FGD	Focused Group Discussion
HoIT	Head of IT
ICT	Information and Communication Technology
IC3	Internet Crime Complaint Center
ID	Identity Document
IDTP	Interoperable Digital Transaction Platform
IMEI	International Mobile Equipment Identity
ISP	Internet Service Provider

IT	Information Technology
M-commerce	Mobile Commerce
MFA	Multi Factor Authentication
MFS	Mobile Financial Service
MITMA	Man-in-the-Middle Attack
NPSB	National Payment Switch Bangladesh
OTP	One Time Password
PAN	Primary Account Number
PC	Personal Computer
PCB	Private Commercial Bank
PIN	Personal Identification Number
POST	Point of Sale terminal
RSA	Rivest–Shamir–Adleman
RTGS	Real Time Gross Settlement
SDB	Specialized Bank
SIM	Subscriber Identity Module
SME	Small and Medium-Sized Enterprise
SMS	Short Message Service
SOC	Security Operation Center
SOCB	State Owned Commercial Bank
SSN	Social Safety Net
TPIN	Transaction PIN
WWW	World Wide Web
2FA	Two Factor Authentications
3FA	Three Factor Authentication

Executive Summary

The use of internet in the modern context has transformed the global financial sector. People can bank whenever and wherever they want, without physically visiting a bank branch. The banking sector believes that by embracing new technologies, banks would improve customer service and bring clients closer to the bank. Nowadays, Alternative Delivery Channels (ADCs) like Internet Banking, ATM, Agent Banking, MFS, and App Banking are gaining popularity in the banking domain. However, Internet Banking is the most potent real-time online banking with the least cost beyond all technologies. An Internet Banking account is simple to open and easy to operate. It is convenient because customers can quickly pay bills without standing in a long queue and transfer funds between accounts from nearly anywhere in the world. Also, customers do not have to keep receipts of all of their bills, as they can now easily view transactions on-line. The only thing needed is an active internet connection. It is fast and efficient. Funds get transferred from one account to the other very fast. Users can keep an eye on their transactions and account balance all the time. Customers no longer need to update passbooks to know their total account balance. Internet Banking helps in maintaining genuine records and aids security to the customers. Customers can get to know about any fraudulent activity or threat to their account before it can pose any severe damage. It's a great medium for banks to endorse their products and services.

While Internet Banking has numerous advantages, it also has a few disadvantages. Understanding how to use Internet Banking may be tough at first. As a result, a person who is new to technology may encounter some difficulties. Users cannot have access if they do not have an internet connection; thus, it may not be helpful without internet access. Security of transactions is a big issue. Account information might get hacked by unauthorized people over the internet. If the bank's server is down, users cannot access their accounts. Sometimes, it may be challenging to determine whether the transaction was successful due to a loss of internet connectivity or a poor connection. A customer may get irritated by constant notifications through emails and updates.

This study used both primary and secondary data. Primary data were collected from the IT departments of banks through a semi-structured questionnaire. Questionnaires were sent to the all heads of IT of the banking sector, of which 28 questionnaires were received. This study covered 4 government banks and 24 private commercial banks, including 5 Islamic banks, and 3 foreign commercial banks. We also sent another set of questionnaire to 200 randomly selected Internet banking users of which 183 respondents provided answers. For non-users we also designed a separate set of questionnaire and collected data from 122 randomly selected respondents. Among 305 (183 from Internet banking users and 122 from non-users), responses from 284 were analyzed and 23 responses (15 Internet banking users and 8 non-users) were rejected for giving insufficient data by the respondents. Further, the review team discussed with 10 heads of Internet Banking for getting in-depth picture regarding different aspects of Internet banking in Bangladesh. Regarding secondary data, various publications of BB, BB circulars, annual reports of banks, various previous reports of BIBM and policy guidelines, and related published research articles were reviewed. To identify factors that affect customers' satisfaction, Factor Analysis was carried out, followed by Logistic Regression model.

The research shows the market penetration of Internet Banking in Bangladesh. Only one bank provided transactional Internet Banking services in 2001, and the number rose to 35 in 2019. In 2019, Internet Banking accounted for only 0.99% of the total number of accounts (249.18 Million), though there was a vast scope to bring those accounts under Internet Banking services. Among all ADCs, Internet Banking possessed only 6.5% of the total volume of transactions, and only 0.5% of the total number of transactions. Still, a big portion of customers is not aware of Internet Banking. The Private Commercial Banks (PCBs) mostly dominate the market share of all types of ADCs. In the case of offering Internet Banking services, PCBs are taking the lead compared to FCBs. PCBs hold more than 92% and 78% of total customers and transactions, respectively. Nevertheless, in the case of volume of transactions, FCBs hold nearly 69% of the total amount of transactions. SCBs and SBs are not offering Internet Banking services, though they have a vast customer base.

The survey identified the factors influencing customers' trust in Internet banking. Some common factors are: do not have a clear idea about the channel and do not know where and how to communicate; fear of technology, virtual banking, and complex operation; panic of security, hacking, and fraud; absence of touch feel factor and fear of unattended and lost device. Banks may have taken various measures like awareness building, security tightening, and instant communication with customers to create a strong, trusted relationship. Moreover, for instant support, mainly for security and fraudulent activities, banks can also establish a call center and provide 24-hour support. So, more emphasis should be given to improving customers' trust.

The study attempted to uncover the primary factors that prevent users in Bangladesh from accepting Internet Banking from both the banks' (supply-side) and customers' (demand side) perspectives. The factor that both banks and customers identified are less interest of senior citizen (age), less participation of women (gender), less interest of rural people (area of living), lack of awareness, fear of security, lack of technical skills, complexity of the service (ease of use), poor English proficiency (less education); device unavailability, lack of internet connectivity and poverty (low income); high bandwidth cost and lower internet speed (internet quality). Therefore, banks may critically analyze the above-mentioned factors to boost the Internet Banking market in our country.

The Covid-19 pandemic has wreaked devastation on our country's economy. The banking sector was likewise hit hard by the severe effects of Covid-19. However, in the case of Internet Banking, a completely different picture is observed. As customers are trying to maintain social distancing and avoiding human interactions, 55 percent of banks witnessed a sudden growth of Internet Banking due to the impact of COVID-19. Both volume and number of transactions have increased by 62% and 57%, respectively.

Most importantly, 53 percent new customers were added in this pandemic situation to get Internet Banking services. App banking can also be thought of as an alternative to Internet Banking. In all aspects, the growth of App banking is higher than Internet Banking due to the COVID-19 pandemic. More emphasis may be given to hold this growth in the future. An interesting point found from the study is that before COVID-19 corporate clients were not interested in internet banking. Less than 2% of total transactions were done by them, consisting of 41.1% of the total volume of transactions. However, during the COVID-19 situation, business firms considered Internet Banking a suitable

medium for conducting business. All banks, irrespective of the degree of advancement in digital banking, need to emphasize Internet banking. Banks also need to enhance the capacity to design and launch new products and offerings to handle the COVID situation.

Bangladesh Bank (BB) has been actively working to strengthen the banking sector's comprehensive IT infrastructure for a long time. Proper BB rules and monitoring have also aided the IT departments of several banks in expanding proper direction. As a result, expectation from BB is increasing day by day. This study identified some additional support to strengthen Internet Banking in Bangladesh. First, to encourage banks to provide virtual banking, BB may incentivize topmost Internet Banking service providers. Second, BB may request to start Internet/App Banking for those banks that are not providing the services. Third, according to clients' demand, to increase the daily fund transfer limit, Bangladesh Bank may increase the present Internet Banking transaction limit. Fourth, BB may start the Interoperable Digital Transaction Platform (IDTP) as early as possible, which will play a vital role in transferring funds among banks.

Additionally, quick support from BB is required to manage disputes related to NPSB. Banks are demanding online CIB of BB for digital lending. Bangladesh Bank may mandate establishing SOC for all banks with proper guidelines to prevent potential Internet Banking security threats. The Bangladesh Bank may establish a distinct set of guidelines to improve the management of Internet banking. Periodic meetings with stakeholders may be organized to learn about the actual situation and take needed action on Internet Banking.

Internet Banking in Bangladesh:
Trust, User Acceptance and Market Penetration

1.0 Background of the Study

Banking has never been more significant to our society than it is today. Now-a-days, Bank and Information Technology are closely related. Bank provides services to its customers in a very efficient way using various technologies. The spread of communication and computer technology and the handiness of the Internet have made it possible that one can do most banking transactions from a far-off location even without stepping into a physical financial structure-that is, the emerging of e-banking (Bruene, 2010). The way Bill Gates announced in 2008 that 'banking is essential, banks are not'- means that traditional bank branch is going to be wiped out in order to be replaced by electronic banking which continues to attract new users. The banking industry believes that by embracing new technology, the banks will be able to expand customer service level and tie their customers closer to the bank. So, technology is one of the key enablers in banking.

According to a report published by Allied Market Research (2020), the size of online banking market is expected to reach from $7,305 million in 2016 to $29,976 million in 2023, growing at a Compound Annual Growth Rate (CAGR) of 22.6 percent. Customer convenience, higher interest rates, and technologically advanced interface mainly drive the market. Growth in smartphone usage, increase in Internet penetration among consumers, and increasing technology and growth of developing economies in Asia-Pacific region are some of the key factors, which are driving the market growth. Europe is the market leader and accounts for nearly 31% share of the global market in 2017, closely followed by North America. In addition, Asia-Pacific is estimated to grow at the highest CAGR of 26.1% during the forecast period due to rise in Internet users, and increase in consumer base due to higher population size of emerging economies such as China and Japan.

Nowadays, Alternative Delivery Channels (ADCs) like Internet Banking, ATM, Agent Banking, MFS, and App Banking are gaining popularity in the banking domain. However, beyond all technologies, Internet Banking is the most powerful real time online banking with least cost. An Internet Banking account is simple to open and easy to operate. It's convenient, because customers can easily pay any kind of bills without standing in a long queue and transfer funds between accounts from nearly anywhere in the world. Also, customers do not have to keep receipts of all of their bills, as they can now easily view transactions that are available all the time. Account holders can perform account related tasks from anywhere and at any time, even at night or on holidays when the bank is closed. The only thing needed is to have is an active Internet connection. It is fast and efficient. Funds get transferred from

one account to the other very fast. Users can keep an eye on their transactions and account balance all the time. Customers no longer need to get passbooks updated to know their total account balance. Internet Banking helps in maintaining genuine records and aids in providing security to the customers. Customers can get to know about any fraudulent activity or threat to their account, before it can pose any severe damage. It's a great medium for the banks to endorse their products and services. More online services include loans and investment options.

While Internet Banking has many positives, there are also a few disadvantages. Initially, understanding the usage of Internet Banking might be difficult. So, a person who is new to technology might face some difficulties. Security of transactions is a big issue. Account information might get hacked by unauthorized people over the Internet. If the bank's server is down, then users cannot access their accounts. Due to the loss of net connectivity or a slow connection, it might be hard to know if the transaction went through. A customer might get overly marketed too and become annoyed by notifications, though these can easily be turned off. One might become annoyed by constant emails and updates.

Customer trust is one of the factors that is analyzed by scientists and business analysts. Trust is being investigated as the originator of customers' loyalty and satisfaction. Commercial banks are not an exception, and trust is one of the drivers of clients' attraction. Internet Banking is one of the most popular services provided by commercial banks, and this channel has a positive impact on the performance of banks. Psychological traits are vital in impelling the processes of cognitive perception that, in turn, influence usage intentions. Moreover, trust has a positive impact on customers' and Internet Banking relationship in a long-term perspective.

'Customer satisfaction' not only means a happy customer but rather more than that. In any business, satisfying a customer is the crucial goal of business. It is an important theoretical as well as practical issue for most marketers and consumer researchers, because organizations sometimes do not really recognize what actually goes on in customer's mind (Fournier and Mick, 1999). The concept of customer satisfaction is equally important for service organizations such as banks, as many of them subscribe to the fact that higher customer satisfaction will lead to greater customer loyalty (Boulding et al., 1993), which in turn leads to future revenue.

A market penetration strategy is a product market policy, whereby an institute seeks to gain greater control in a market in which it already has an offering. This strategy often focuses on capturing a larger share of an existing market. Pikkarainen et. al. (2004) mentioned two fundamental reasons underlying online banking development and penetration. First, banks

get significant cost savings in their operation through e-banking services. It has been proved that online banking channel is an economical delivery channel for banking products once established. Second, banks have reduced their branch networks and downsized the number of service staff, which has led to self-service channels as quite many customers felt that branch banking took too much time and energy. On the other hand, customers enjoy self-service, freedom from time and place constraint, and reduced stress of queuing in banking hall. Therefore, time and cost savings and freedom from place are the main reasons underlying online banking acceptance. Liao and Lin (2008) stress that the success in Internet Banking will be achieved with tailored financial products and services that fulfill customer' wants, preferences and quality expectations.

The most important improvement arising from use of ICT in the enhancement of operations and activities of commercial banks is hinged on the reduction in overhead expenses. Specifically, the costs related to the maintenance of physical branches, marketing and labour can be appreciably cut (Hernado and Nieto, 2007).

Bangladesh Bank (BB) adopted IT in endorsing the payment system's functionality and modernization on an ongoing basis through the development of Bangladesh Automated Clearing House (BACH), Bangladesh Electronic Funds Transfer Network (BEFTN), National Payment Switch Bangladesh (NPSB) and a Real-Time Gross Settlement (RTGS) System. Therefore, Bangladeshi banking environment has become more compatible with the standards of international financial system, by the positive impact of all these efforts. Internet Banking got momentum after introduction of these facilities by the central bank of Bangladesh.

With times, many banks in Bangladesh have come up with their own Internet Banking to deliver all these accompaniments that one customer can get by using Internet. Internet Banking is, therefore, viewed by the technologically advanced banks of Bangladesh as a way to emphasise on best facility in terms of security and advance tech adoption. Over the last five years, top online banks of Bangladesh have recognized the significance of service standard and customer experience.

However, no study has so far been carried out to investigate the trust, user acceptance and market penetration of Internet Banking in Bangladesh. This study was an attempt to identify these issues on the banking sector of scheduled commercial banks operating in Bangladesh, including public, private and foreign sector banks.

1.1 Objectives of the Study

The paper aimed to examine the scenario of Internet Banking in Bangladesh in three dimensions: trust, user acceptance and market penetration. In this broader framework, the specific objectives of the study were to: evaluate the current status and market penetration of Internet Banking of banks in Bangladesh; examine the factors that affect customers' trust and acceptance; analyze the gap between expected and actual satisfaction of customers in banks; and suggest some course of actions to increase the use of Internet Banking in Bangladesh.

1.2 Methodology

This study used both primary and secondary data. Primary data were collected from the IT departments of banks through a semi-structured questionnaire. Questionnaires were sent to all heads of IT of the banking sector that are providing transactional internet banking services (35 banks) of which 28 questionnaires were received. This study covered 4 government banks and 24 private commercial banks, including 5 Islamic banks and 3 foreign commercial banks. We also sent another set of questionnaires to 200 randomly selected Internet Banking users of which 183 were received. For non-users, we also designed a separate set of questionnaires and collected data from 122 randomly selected respondents. Among 305 (183 from Internet Banking users and 122 from non-users) responses, 284 were analyzed and 23 responses (15 Internet Banking users and 8 non-users) were rejected for insufficient data provided by the respondents. Further, the review team discussed with 10 heads of Internet Banking for getting in-depth pictures regarding different aspects of Internet Banking in Bangladesh. In this regard, the discussion has been noted and summarized for better prediction of Internet Banking. As to secondary data, various publications of BB, BB circulars, annual reports of banks, various previous reports of BIBM and policy guidelines, and related published research articles were consulted for preparing this report. To identify factors that affect customers' satisfaction, Factor Analysis was carried out. We also calculated the satisfaction gap that a customer expects and observes. In this study, we used the five-point 'Likert' Scale to measure the variables. To see why people are not accepting Internet Banking in Bangladesh, a Logistic Regression analysis was also carried out. The findings of this report have mainly been presented in tabular form, along with some graphical presentations. The report has been finalized after accommodating the opinions and comments of the participants and experts of the banking sector at the seminar where the draft paper was presented.

1.3 Limitations of the Study

Due to several limitations, it was not possible to adequately highlight everything. Because of Corona virus pandemic, collecting information by going outside was not easy. Every person has his/her own secrecy that is not revealed to someone who is an outsider. Some people were not willing to disclose their information related to their banking for the fear of fraud. Many

people were reluctant to provide the response to the questionnaire. The data obtained from this research are only applicable for banks in Bangladesh and did not include other sectors of the economy.

1.4 Literature Review

Many research on 'Internet Banking' have been done, both at home and abroad, regarding user acceptance, market penetration and trust. According to Morgan and Hunt (1994), "Trust is at the heart of all kinds of relationships". Definitions and conceptualization vary with disciplines, such that psychologists view trust as a personal trait, sociologists consider it a social construct, and economists see it as an economic choice mechanism (McKnight and Chervany, 2002). In the social psychology realm, Rousseau et al. (1998, p. 394) define trust as "perceptions about others' attributes and a related willingness to become vulnerable to others." In this sense, consumers might not use e-commerce because they lack trust in Internet businesses (Grewal et al., 2004). With greater trust, people can resolve their uncertainty regarding the motives, intentions, and prospective actions of others on whom they depend (Kramer, 1999), as well as save money and effort, because trust reduces monitoring and legal contract costs (Fortin et al., 2002). The lack of trust in online transactions and Web vendors thus represents an important obstacle to the market penetration of e-channels (Liu et al., 2004). Moreover, research indicates that trust has a critical influence on users' willingness to engage in online exchanges of money and sensitive personal information (Friedman et al., 2000).

Studies on factors that affect consumers' trust and usage of financial services have shown that trust of the website influences usage intentions; transaction security, website and company awareness influence cognitive trust, while transaction security influences affective trust (Pi, Liao & Chen, 2012). Online trust has been defined as the Internet user's psychological state of risk acceptance based on the positive expectations of the intentions or behaviours of an online service provider (Rousseau et al., 1998). Beyond satisfaction, repeat purchase is highly influenced by trust of the provider (Liang, 2008). While most studies on trust and Internet Banking or online financial services have established direct effects between trust and usage intentions, there are attempts to explore Internet Banking security management through trust management (Koskosas & Koskosas, 2011). Security appears to be an important factor related to mistrust of Internet Banking services (Kasemsan & Hunngam, 2011).

'Customer Satisfaction' not only means a happy customer but rather more than that. In any business satisfying a customer is the crucial goal of business. It is an important theoretical as well as practical issue for most marketers and consumer researchers, because organizations sometimes do not really recognize what actually goes on in customer's mind (Fournier and

Mick, 1999). The concept of customer satisfaction is equally important for service organizations, such as banks, as many of them subscribe to the fact that higher customer satisfaction will lead to greater customer loyalty (Boulding et al., 1993) which in turn leads to future revenue.

Although there has been dramatic rise in the number of Internet users all round the world, security and trust issues still persist (Suh and Han, 2003). Davis' (1989) work has shown that user acceptance of information technology is determined by two influential factors; perceived usefulness and perceived ease of use. Perceived usefulness is defined as the degree to which a person believes that using a particular system would enhance performance while perceived ease of use refers to the degree to which a person believes that using a particular system would be free from effort. Perceived usefulness and perceived ease of use are known to positively affect the acceptance of Internet Banking services (Kasemsan & Hunngam, 2011).

Although service providers, financial institutions, the media, security organisations, and security experts have continually provided technical information and verbal assurances on dealing with online security threats, consumers are fearful of the intruder getting hold of their accounts and other confidential information and hence security preys heavily on consumers' minds (White & Nteli, 2004). The fear is heightened by the nature of recent trends of security breaches and attacks reported by the media which computer security experts have found highly complex and sophisticated to comprehend. In addition, pronouncements on Internet Banking security by high profile officials that Internet Banking is less safe than having a traditional account (Cecil, 2010) heightens consumer concerns of Internet Banking security. Risk is a critical factor in adopting technology (Sathye, 1999; Salisbury et al., 2001) and is defined in relation to Internet Banking as the security and reliability of transactions over the Internet (Sathye, 1999).

Customer acceptance is a key indicator of technology usage (Sathye,1999) and barriers to Internet Banking adoption include consumer concerns of media information on security breaches, the reliability of online transactions, the security of the Internet Banking system and banks capability of protecting customers' accounts and privacy (Rotchanakitumuuai & Speece, 2003; Wang et al., 2003). Consumers, therefore, are more likely to use Internet Banking when they perceive no risk to their bank accounts and other confidential information and are aware of security measures (Sathye, 1999; Salisbury et al., 2001; Cheng et al., 2006). These observations suggest that perception of Internet Banking security is likely to influence usage intentions and also customer awareness and knowledge of security are likely to influence their views on Internet Banking security.

A market penetration strategy is a product market policy whereby an institute seeks to gain greater control in a market in which it already has an offering. This strategy often focuses on capturing a larger share of an existing market. Pikkarainen et al (2004) mentioned two fundamental reasons underlying online banking development and penetration. First, banks get significant cost savings in their operation through e-banking services. It has been proved that online banking channel is an economical delivery channel for banking products once established. Second, banks have reduced their branch networks and downsized the number of service staff, which has surfaced the way to self-service channels as quite many customers felt that branch banking took too much time and energy. On the other hand, customers enjoy self-service, freedom from time and place constraint, and reduced stress of queuing in banking hall. Therefore, time and cost savings and freedom from place have been found the main reasons underlying online banking acceptance. Liao and Lin (2008) stress that the success in Internet Banking will be achieved with tailored financial products and services that fulfill customer' wants, preferences and quality expectations.

2.0 Analysis and Findings

2.1 Current Status of Internet Banking

Technology plays a key role to enhance financial inclusion. Availing the opportunity of modern technology, financial inclusion process may be expedited. Internet Banking is playing a very vibrant role for covering more people in the banking services. Moreover, Bangladesh Bank’s policies inspire banks to reach out to distant communities with Internet Banking and accordingly huge progress has been observed in using Internet Banking services for individual’s financial inclusion. It has lower overhead costs and allows banks to serve the customers who are not being fully benefitted from the traditional bank based financial services or are completely unbanked. As a result, both banks and customers are incentivized for offering and availing of Internet Banking services.

There are three types of Internet Banking: informational, communicative and transactional. Informational Internet Banking is a fundamental level of banking. It does not allow patrons to view or maintain accounts, nor does it allow for communication between the financial institution and customers. It simply means the bank offers basic information about its products and services, much like a booklet. This is meant for marketing purposes only, and there is no connection to the bank's main computer systems. Communicative Internet Banking permits for some communication between the client and bank. However, this is typically restricted to fundamental interactions such as account inquiries, new account updates, loan or mortgage applications, contact information updates and balances. It may connect with the bank's main computer systems. Transactional Internet Banking is the most popular online banking type. It offers all of the benefits of a traditional brick-and-mortar organization. This

includes full control over customers' accounts—deposits, withdrawals, transfers, updates and online payments. In this paper 'Internet Banking' will be treated as 'Transactional Internet Banking'.

2.1.1 Number of Banks Providing the Services

Currently, 61 banks are providing banking services in Bangladesh. Among them, 35 banks (58%) have been providing transactional Internet Banking services to their customers along with informational and communicational services. The rest of the 6 and 20 banks deliver informational and communicational services, respectively. According to the findings, 61.5 percent banks have a separate department to provide Internet Banking services. If a bank does not have separate department for a particular service, like Internet Banking, it will be very difficult for them to provide smooth services to their customers. The average, minimum and maximum number of employees in the Internet Banking divisions were 6.56, 2 and 20, respectively.

In our study, we have asked banks to describe the benefits that they and their customers are getting from Internet Banking services. The benefits reported by banks are shown in Table-1 and Table-2.

Table 1: Major Benefits that Banks are getting from Internet Banking

Major Benefits	% of Banks
Less pressure on branch employee	71.0
Services can be provided with little or no error without any hassle	48.4
Great medium for banks to endorse their product and services (marketing/cross selling)	63.9
It appears as an income generating source for banks as customers are charged annually for this service	35.5
Less stationary and administrative costs ensuring green banking	42.6
Financial inclusion increased as young customers are more attracted in Internet Banking than doing traditional banking	28.4
Customer management is easy	42.6
Transaction cost is the least compared to branch and other ADCs as total operation is done by customers	45.5

Source: BIBM Survey

Table 2: Major Benefits that Customers are getting through Internet Banking

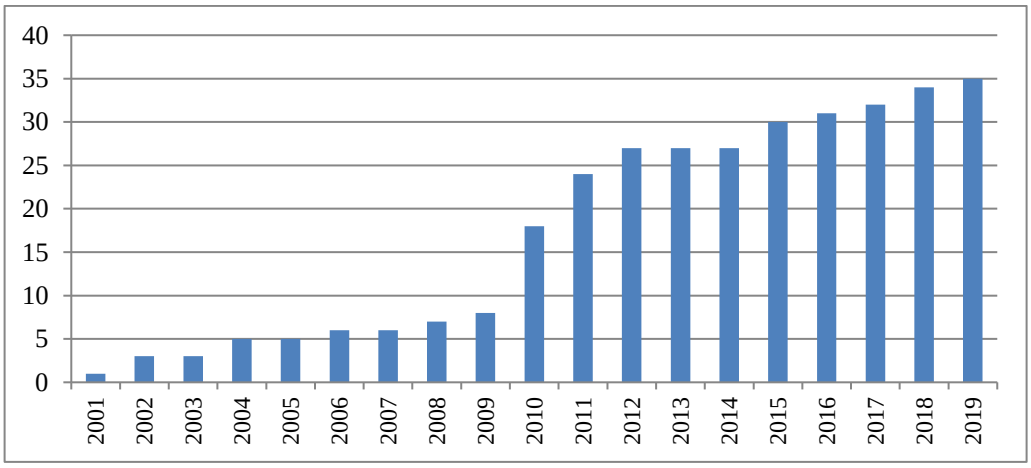
Major Benefits	% of Banks
Banking from anywhere and anytime (24×7×365) without visiting the branch physically. This facility benefits customers the most in disastrous/pandemic situation like COVID.	91.7
Less time and less cost	66.7
Customers can keep an eye on their transaction all the time	33.3
Corporations have easier access to information	35.5

Source: BIBM Survey

2.1.2 Trends in Internet Banking Adoption

In 2001, only one bank was providing transactional Internet Banking services; and the number increased, with 18 in 2010 and 35 in 2019 (Figure-1). Still no state-owned commercial bank is providing transactional Internet Banking service in Bangladesh.

Figure 1: No. of Banks Providing Transactional Internet Banking



Source: BIBM Survey, Bangladesh Bank

2.1.3 Number of Internet Banking Users

The development of Internet Banking encourages people to do virtual banking activities for account inquiry, funds transfer; payment of utility and credit card bills; loan installments, insurance premium etc. even from remote areas. Apart from urban people, individuals involved in agri-business and SME business are gradually using Internet Banking. The high growth rates of number and volume of transactions show how effectively it helps to achieve the goal of financial inclusion and creates an appropriate alternative of traditional branch-based banking activities. A rise in the number of smartphone users also encouraged the use of Internet Banking through mobile Apps. Table-3 shows data of total number of bank accounts in millions from 2015 to 2019. At the end of 2019, there were 249.18 million

accounts. Among the total accounts, deposit and MFS accounts covered approximately 74 percent. And, a remarkable Compound Annual Growth Rate (CAGR) is seen in Agent Banking. Unfortunately, Internet Banking facilities were availed by less than 1 percent customers (0.99%) at the end of 2019. Although, the number of customers has increased in each year, still a big portion of customers are not aware of opening Internet Banking account and even many customers do not know the facilities of Internet Banking.

Table 3: Total Number of Bank Accounts in Millions

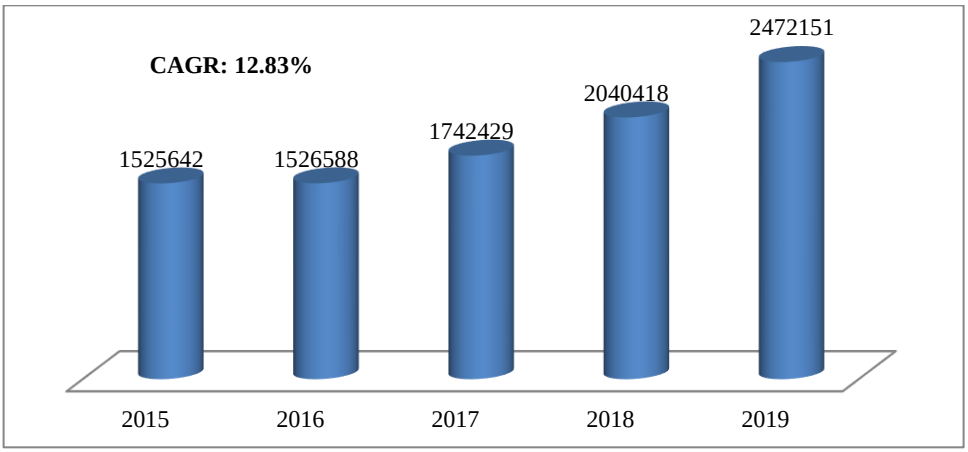
Type of Account	2015	2016	2017	2018	2019	CAGR (%)	% of Total Accounts (2019)
Deposit	76.22	81.43	87.52	95.23	106.6	8.75	42.78
Advance	9.89	10.14	10.57	10.63	10.83	2.30	4.35
MFS Agent Accounts	0.56	0.71	0.79	0.89	0.97	14.72	0.39
MFS Clients Accounts	31.8	41.1	58.8	67.5	79.6	25.78	31.94
Social Safety Net (SSN) Program	3.9201	4.2497	4.5806	5.0622	5.6007	9.33	2.25
Employment Generation Program for the Poorest	2.0416	2.2026	2.2729	2.5792	2.6622	6.86	1.07
Freedom Fighters	0.1914	0.2168	0.201	0.2061	0.2475	6.64	0.10
Farmer's Account	8.9339	9.0436	9.238	9.6868	10.1866	3.33	4.09
Others* 10, 50, 100 Taka Accounts	0.5862	0.7582	0.7771	0.944	1.8232	32.80	0.73
Agent Banking Agents Account	0.000208	0.002334	0.002577	0.004506	0.007914	148.36	0.00
Agent Banking Clients Account	0.097037	0.525144	1.214561	2.456765	5.257769	171.31	2.11
Credit Card Accounts	0.62	0.95	0.91	1.18	1.54	25.54	0.62
Debit Cards	8.62	9.95	11.65	14.3	18.23	20.59	7.32
Prepaid Cards	0.14	0.18	0.14	0.21	0.41	30.82	0.16
SME Accounts	0.7049	0.6067	0.712	0.6608	0.7513	1.61	0.30
School Banking	1.035	1.2574	1.4539	1.8184	1.9929	17.80	0.80
Internet Banking Customers	1.53	1.53	1.74	2.04	2.47	12.72	0.99
Total	**146.89**	**164.85**	**192.57**	**215.40**	**249.18**	**14.12**	**100.00**

Source: Monthly Economic Trends, Scheduled Bank Statistics and Financial Inclusion Department, Bangladesh Bank

*'Others' include accounts for garments workers, cleaners of city corporations, handicapped people, etc.

If banks can make customers aware about this facility and bring accounts such as, Social Safety Net (SSN) Program, Employment Generation Program for the Poorest, Freedom Fighters, Farmer's Account; 10, 50, 100 Taka Accounts and SME Accounts under Internet Banking services, the market penetration of Internet Banking will be much easier. So, there is a huge scope for expansion of Internet Banking in Bangladesh.

Figure 2: Number of Users of Internet Banking in Bangladesh



Source: Monthly Economic Trends, Bangladesh Bank

2.1.4 Number of Transactions

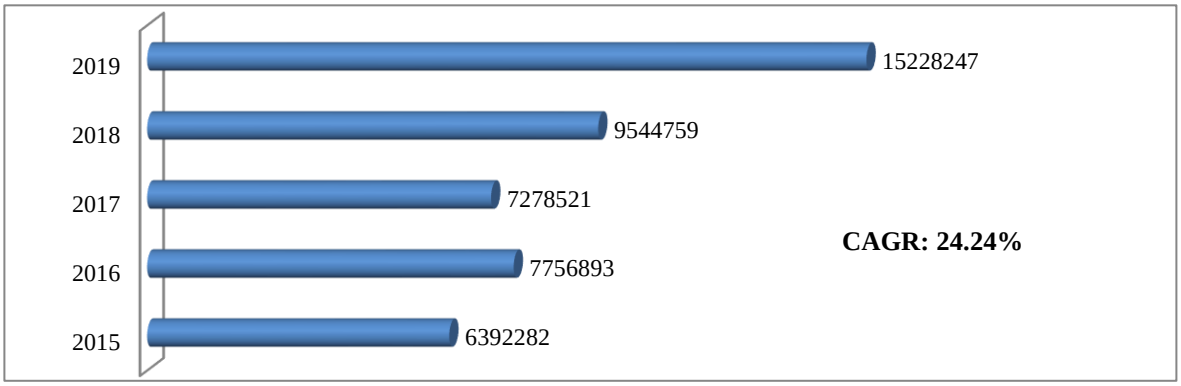
Among all delivery channels, the CAGR of Agent Banking is the highest (177.%), indicating a massive growth in this ADC (Table-4). Bangladesh Banks' initiatives for financial inclusions helped in this growth. However, the CAGR of Internet Banking is reasonable compared to card, ATM, POST and mobile banking, except Agent Banking. In case of ATM, CAGR is the lowest (9.7%). The number of Internet Banking transactions more than doubled from 2015 to reach 15.23 million in 2019, indicating that Internet Banking is gaining popularity day by day, although a large market is still untapped. One point worth noting is that among the total 3145.17 million transactions in 2019, 2589.8 million transactions were done using mobile banking. It clearly represents the mass level acceptance and use of mobile banking in Bangladesh.

Table 4: Total Number of E-Banking Transactions (In Millions)

Types of Transactions	2015	2016	2017	2018	2019	CAGR
Total Card (Credit Card, Debit Card, etc.)	137.23	170.91	182.16	217.49	253.42	16.57
Internet Banking	6.39	7.76	7.28	9.54	15.23	24.25
Mobile Banking	1166.1	1473.2	1875.6	2272.8	2589.8	22.08
Agent Banking	0.84	4.2	9.87	22.64	49.46	177.01
ATM	141.95	172.78	184.62	178.27	205.59	9.70
POST	14.08	17.36	21.16	26.02	31.67	22.46
Total	**1466.59**	**1846.21**	**2280.69**	**2726.76**	**3145.17**	**21.01**

Source: Monthly Economic Trends and Scheduled Bank Statistics, Bangladesh Bank

Figure 3: Number of Transactions of Internet Banking in Bangladesh



Source: Monthly Economic Trends, Bangladesh Bank

2.1.5 Volume of Transaction

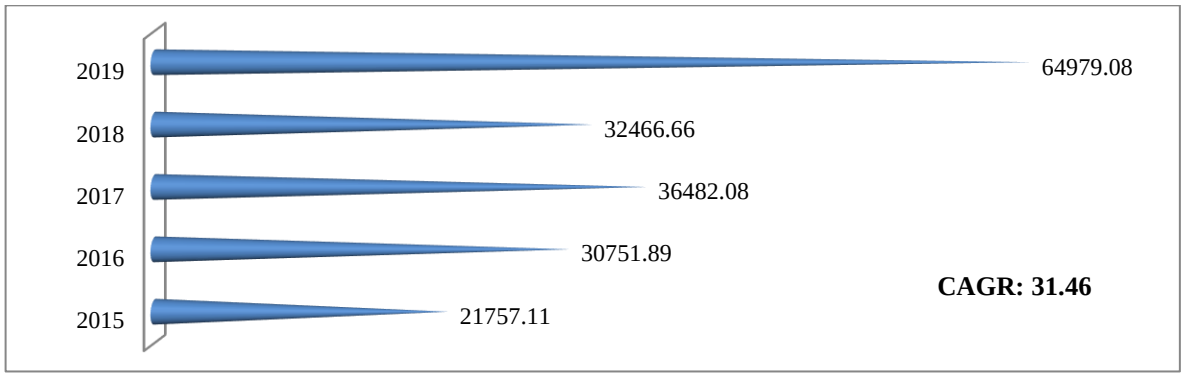
As already seen from the previous two tables, the CAGR is the highest for Agent Banking (206.6 %), whereas CAGR is the lowest for POST (9.95%). In case of Internet Banking, 649.79 billion crore taka was transacted in 2019 which is approximately three times than in 2015 (Table-5). Some of the reasons behind this growth are Internet availability, number of banks giving Internet Banking services, customers' awareness, increasing number of smart devices etc.

Table 5: Volume of E-Banking Transactions (Billion Crore Taka)

Types of Transactions	2015	2016	2017	2018	2019	CAGR
Total Card (Credit Card, Debit Card, etc.)	1030.24	1234.31	1335.53	1549.46	1817.34	15.25
Internet Banking	217.57	307.52	364.82	324.67	649.79	31.46
Mobile Banking	1772.8	2346.9	3146.6	3788.9	4343.2	25.11
Agent Banking	15.09	73.06	210.34	537.14	1332.93	206.57
ATM	1073.23	1253.62	1357.26	1385.3	1627.41	10.97
POST	120.94	123.92	133.03	150.82	176.77	9.95
Total	**4229.87**	**5339.33**	**6547.58**	**7736.29**	**9947.44**	23.84

Source: Appendix XXXV, Financial Stability Report; Monthly Economic Trends, 2016-2020, Bangladesh Bank

Figure 4: Volume of Transaction (in Crore Tk.) of Internet Banking in Bangladesh

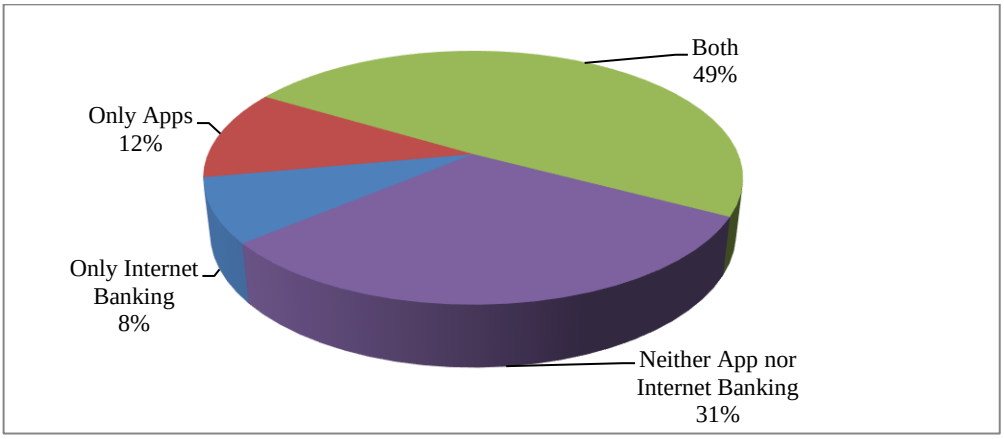


Source: Monthly Economic Trends, Bangladesh Bank

2.1.6 Current Status of Banks Regarding Internet Banking and App Services

App banking is sometimes considered as an advanced ways of banking, using Internet. In future, app banking may appear as a substitute of Internet Banking. At present, 35 banks are providing app- based banking services. Only 8% banks provide Internet Banking services and 12% banks have only banking apps whereas 49% banks deliver both of the facilities (Figure-5). This shows the expertise and dexterity of those banks in operating ADCs. Less than one-third (31%) banks do not use any of the two services which indicate a negative sign for their ADC development; and they should focus on developing such FinTech to provide latest technological services to their customers with least cost.

Figure 5: Current Status of the Banks Regarding Internet Banking and App Services



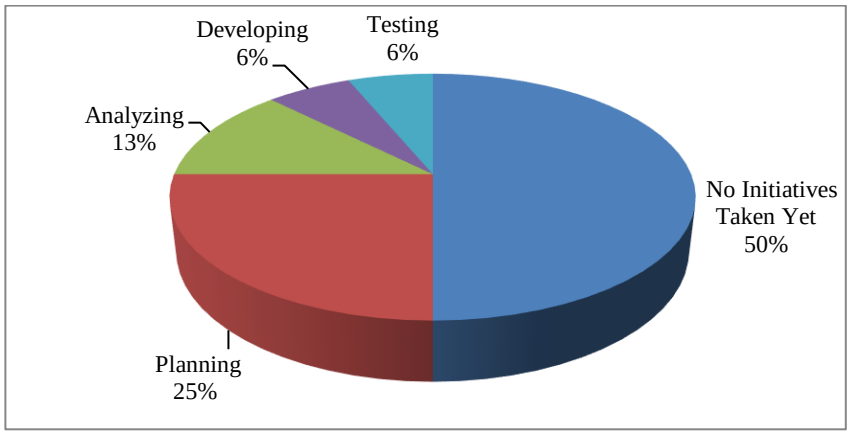
Source: BIBM Survey

2.1.7 Current Status of the Banks Having No Internet Banking Services

One-quarter (25%) banks are planning to provide Internet Banking, while 13% are analyzing the systemthat are going to be developed. About 6% are in the development phase and another

6% are testing the developed system, which means these 6% banks are going to offer Internet Banking very soon (Figure-6). However, one-half of banks, mainly state-owned banks haven't taken any initiatives so far to start transactional Internet Banking.

Figure 6: Current Status of the Banks Having No Internet Banking Services

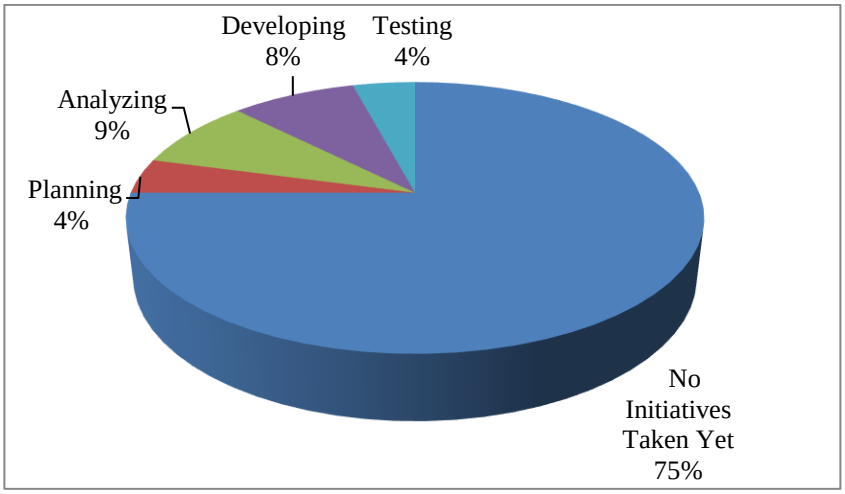


Source: BIBM Survey

2.1.8 Current Status of the Banks Having No Banking App

As Banking App is very powerful and dynamic ADC with diversified services, banks may develop it quickly. Only 4% and 9% banks were in planning and analyzing phase, respectively. Around 8% banks were developing the app and 4% banks were in testing phase (Figure-7). The data show that there is a reluctance to develop FinTech infrastructure, as three-quarters (75% banks --those have no banking apps) hadn't taken any initiatives to develop app to deliver Internet Banking services using smart phone.

Figure 7: Current Status of the Banks Having No Banking Apps

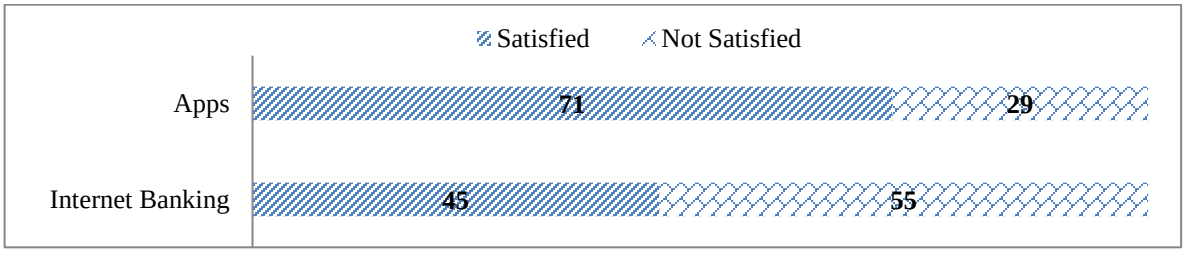


Source: BIBM Survey

2.1.9 Satisfaction of Banks Regarding the Growth of App and Internet Banking

In case of app-based banking, a high portion of banks (71%) were satisfied with the rapid growth of app banking, whereas only 45% were satisfied with the fast progress of Internet Banking services (Figure-8). Those banks which are not observing expected growth in Internet Banking need to find the reasons for slow growth of this ADC and take necessary actions. Findings of this study may help them in this regard.

Figure 8: Percentage of Banks Satisfied Regarding the Growth of App and Internet Banking



Source: BIBM Survey

Table-6 summarizes the factors that influence the satisfactory development of this channel in our country, while Table-7 identifies the obstacles that impede the expected growth of Internet Banking are described.

Table 6: Factors Influenced the Satisfactory Growth of Internet Banking

Factors	% of Banks
Fund transfer to other banks through NPSB, RTGS, BEFTN including MFS	21.3
Anytime banking from anywhere with least cost and time	64.2
Suitable features and services that can be achieved without visiting branches	64.2
Regular new service incorporation	21.3
Regular and instant customer communication through online platform	28.4
Interactive/new marketing strategies to attract customers	35.5

Source: BIBM Survey

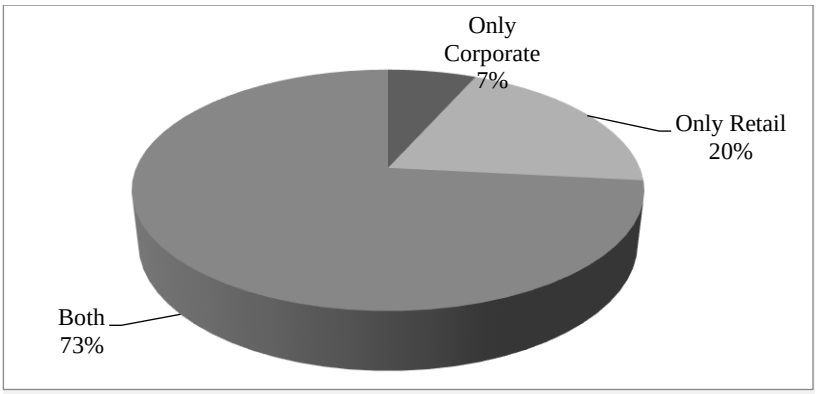
Table 7: Major Barriers Identified by Banks to Achieve Expected Growth in Internet Banking

Factors/ Barriers	% of Banks
Lack of awareness of users regarding Internet Banking	83.9
Absence of adequate advertisements in print, electronic and social media	42.8
For opening Internet Banking account, customers have to go to the branch physically and branch employees failed to encourage customer to avail the service	21.4
Lack of adequate security features and trust, risk of Cyber-attack and fraud; and Less faith of users on dispute management	49.7
Lack of interest from senior citizen, rural people and woman and failed to attract them	78.4
Poor English proficiency of customers	28.3
Poor Internet Services, Service Interruptions/Disruptions mainly in Rural Areas	25.0
Unavailability of device (Computer/Tab/Smartphone) mainly in rural areas	38.9
Lack of technical skill of users and not habituated in adopting Multi Factor Authentication (MFA)	63.2

Source: BIBM Survey

2.2 Internet Banking Services

Figure 9: Types of Internet Banking



Source: BIBM Survey

Types of Internet Banking services that are provided by our banking sector is shown in Figure-9. Approximately 20% banks offer services only to retail clients; however, only 7% banks offer such services to corporate clients. Nearly 73% banks offer service to both retail and corporate clients which is a positive sign.

2.2.1 Retail Internet Banking Services

2.2.1.1 Non-Transactional Internet Banking Services

Through Internet Banking, banks provide various non-transactional banking services. Table-8 shows a list of non-transactional banking services provided by the banks. All banks that are providing Internet Banking services have login password management facilities for their

customers through website. Using this service, customers can change their password, when required. Two factor authentications (2FA) ensure the higher security of Internet Banking services. The research showed that 92.3 percent banks provided 2FA methods, using PIN, OTP, SMS, biometrics, etc. Opening savings and current accounts are two very essential services that customers expect to do using Internet Banking.

Table 8: Non-Transactional Internet Banking Services Provided by Banks (% of Banks)

Services	Yes	No
a) Self-Registration	46.2	53.8
b) Login Password Management	100.0	0.0
c) 2FA Control/Management (PIN, OTP, SMS, etc.)	92.3	7.7
d) Opening Savings Account	7.7	92.3
e) Opening Current Account	7.7	92.3
f) Opening Fixed Deposit /Term Deposit Account	23.1	76.9
g) Opening Deposit Pension Scheme Account	15.4	84.6
h) Opening Loan Account	7.7	92.3
i) Request for New Cheque Book	46.2	53.8
j) Cheque Book Stop	23.1	76.9
k) Standing Order from Own Account	30.8	69.2
l) Request for Pay Order	15.4	84.6
m) Placing Positive Pay Instruction	23.1	76.9
n) Stop Payment (Cheque or Others)	30.8	69.2
o) Download Account Statement/ Transaction Details/History	92.3	7.7
p) View Account Details with Balance	84.6	15.4
q) Request Paper Certificate (Tax, Solvency, etc.)	7.7	92.3
r) Request E-Certificate (Tax, Solvency, etc.)	7.14	92.86
s) View (Track) Issued Cheque Status	41.7	58.3
t) Update Personal Information Like Mobile Number, Email Address, etc.	27.3	72.7
u) Customized Service Request	23.1	76.9
v) Opening Credit Card Account	7.7	92.3
w) Request for Credit Card Account Statement	30.8	69.2
x) Download Credit Card Account Statement/Transaction Details/History	23.1	76.9
y) Request for Credit Card Cheque Book	7.7	92.3
z) Credit Card Cheque Book Stop Request	7.14	92.86
aa) Activate and Deactivate (Block) Card (Credit and Debit)	8.3	91.7
bb) Credit Card Standing Order	15.4	84.6
cc) Request for Credit Card Account Information Change	15.4	84.6
dd) Request for Dispute Investigation	23.1	76.9
ee) Replace Card Request (Credit and Debit Card)	8.33	91.69

Source: BIBM Survey

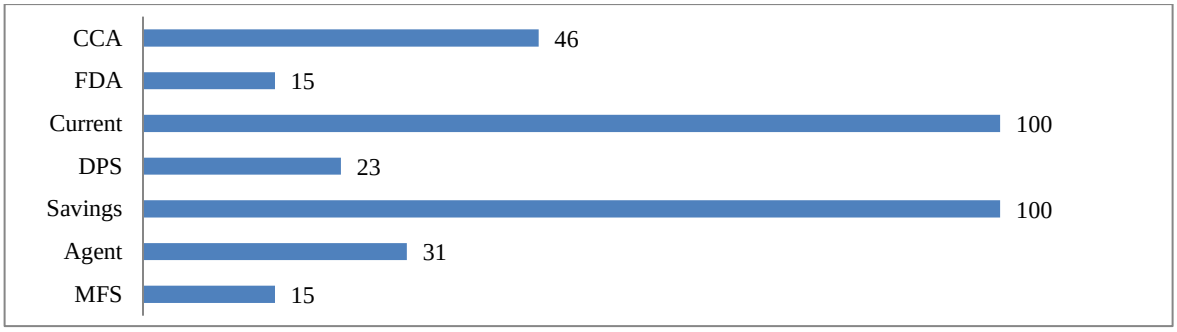
However, 92.3 percent banks were not providing these services to the customers due to security issues. It is mandatory to physically visit bank premises for opening such accounts, although recent e-KYC has opened a new dimension for opening account without physically

visiting bank. Customers expect various types of e-certificates like tax, solvency, etc. However, 92.7 percent banks were not providing such facilities through non-transactional Internet Banking services. 'Cheque book stop' service is another crucial facility which customers need when they suspect any fraudulent activities, although only 23.1% banks offered this facility. Again, a majority of banks (69.2%) do not let their clients to do functions like 'Standing Order from Own Account' and 'Stop Payment (Cheque or Others)', which is not a good indication at all. Through Internet Banking merely 7.14% banks allowed their clients to stop 'Credit Card Cheque Book Request'. Facilities such as, 'Activate and Deactivate (block) Card (Credit and Debit)' and 'Request for Dispute Investigation' services are provided by only 8.3 percent and 23.1% banks, respectively. Banks should give proper attention to provide these vital services which can, in turn, increase their clients.

2.2.1.2 Intra-Bank Fund Transfer (Transfer within the Bank)

Intra-bank fund transfer services that are provided by banks is shown in Figure-10, Figure-11 and Table-9. Banks provide fund transfer services from an individual's own account to the same individual's other accounts of the same bank. The types of interoperable accounts are: Savings Account, Current Account, Credit Card Account (CCA), Fixed Deposit Account (FDA), Deposit Pension Scheme (DPS), Agent Banking Account and Mobile Financial Service (MFS) Account. These services are under close surveillance of the authority of the bank, and provide unique genre to facilitate customers to transfer their fund. Figure-10 shows that 100% banks, which were providing Internet Banking services, facilitated money transfer services from and to current and savings account. Also, 46%, 31% and 23% of the banks provided fund transfer services, to and from, credit card account, Agent Banking account and DPS account, respectively. The number of banks transferring money, to and from, Agent Banking and Credit Card Account was negligible. Very low percentage of banks (15%) were providing money transfer services, from and to, FDA and MFS account; and these services are highly recommended to address the problem.

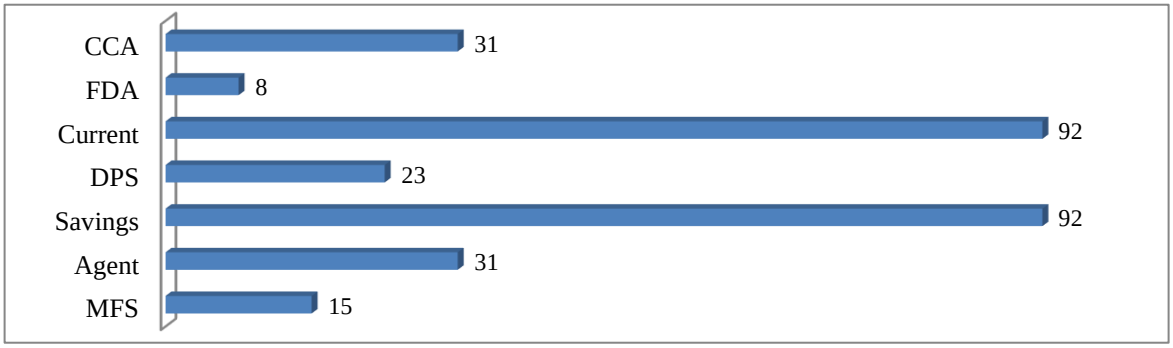
Figure 10: Percentage of Banks Providing Fund Transfer Services from Customers' Own Account to His/Her Other Types of Account of the Same Bank



Source: BIBM Survey

Banks also provide fund transfer services from an individual's own account to other customers' account of the same bank. Figure-11 shows that 92% banks provided services to transfer money from customers' own account to Current and Savings Account of other customers. About 31% of the banks provided fund transfer facilities to Credit Card and Agent Banking Account. Customer of 23% banks could transfer money to DPS accounts of other customers. The facilities provided by banks to transfer money to Agent Banking, Credit Card and DPS Account is quite negligible. . Very low percentage of banks (8%) facilitated their customers to transfer money from their own accounts to Fixed Deposit and MFS Account of other customers; and it is highly recommended to improve these services.

Figure 11: Percentage of Banks Providing Fund Transfer Services from Customers' Own Account to other Customers' Different Types of Account of the Same Bank



Source: BIBM Survey

Table 9: Intra-Bank Fund Transfer Services Provided by Banks (% of Banks)

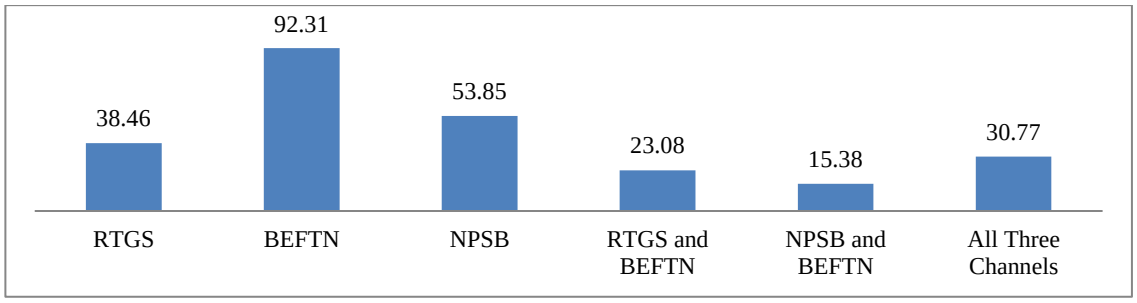
	MFS	Agent	Savings	DPS	Current	FDA	CCA
Customers' Own Account to Customers' Different Types of Account	15	31	100	23	100	15	46
Customers' Own Account to Other Customers' Different Types of Account	15	31	92	23	92	8	31
Customers' Own Credit Card Account to Customers' Others Account	0	8	15	-	15	-	-
Customers' Own Credit Card Account to Other Customers' Account	8	8	15	-	15	-	-

Source: BIBM Survey

2.2.1.3 Inter-Bank Fund Transfer (Customer's Own Bank to Other Banks)

Bangladesh Bank facilitates three channels to transfer funds from one bank to another through Internet Banking. These three systems (NPSB, RTGS and BEFTN) play a vital role to settle transferring of funds. BEFTN was widely used by Internet Banking users to send money from one bank to another bank, and 92.3% banks integrated this channel with their Internet Banking services (Figure-12). After that, 53.9 % banks used NPSB as the background process to transfer money from customers' own account to customers'/others accounts of different banks, while only 38.5 % banks used RTGS for inter-bank fund transfer using Internet Banking. All three channels were used by only 30.8 % banks. Highest attention should be given on RTGS channel, as it is a real time facility to transfer high amount of funds from one bank to other banks.

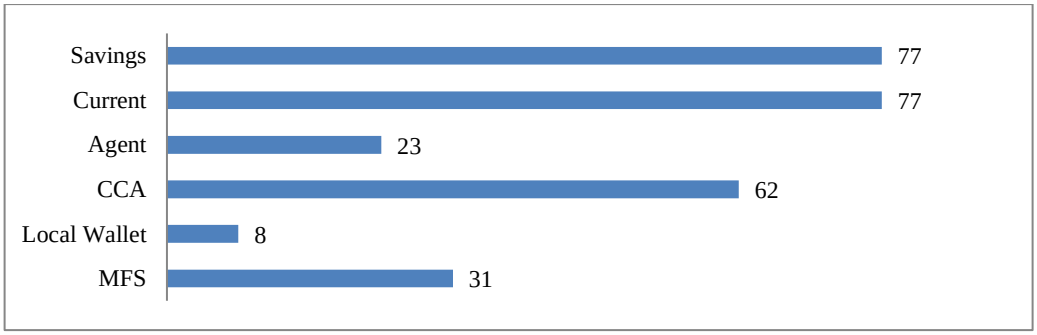
Figure 12: Inter-Bank Fund Transfer using BB's RTGS, BEFTN, NPSB (% of Banks)



Source: BIBM Survey

Different types of account of other banks that are accepted by the customer's own bank while transferring money from customer's own account are shown in Figure-13. Over three-quarters (77%) of banks allowed transferring funds to savings and current accounts, 62% banks allowed transferring money to credit card account, only 23% of banks transferred funds to Agent Banking, 31% to MFS account, and only 8 percent to local wallet of other banks which needs to be improved.

Figure 13: Types of Accounts of Other Banks Accepted for Fund Transfer through BB (% of Banks)

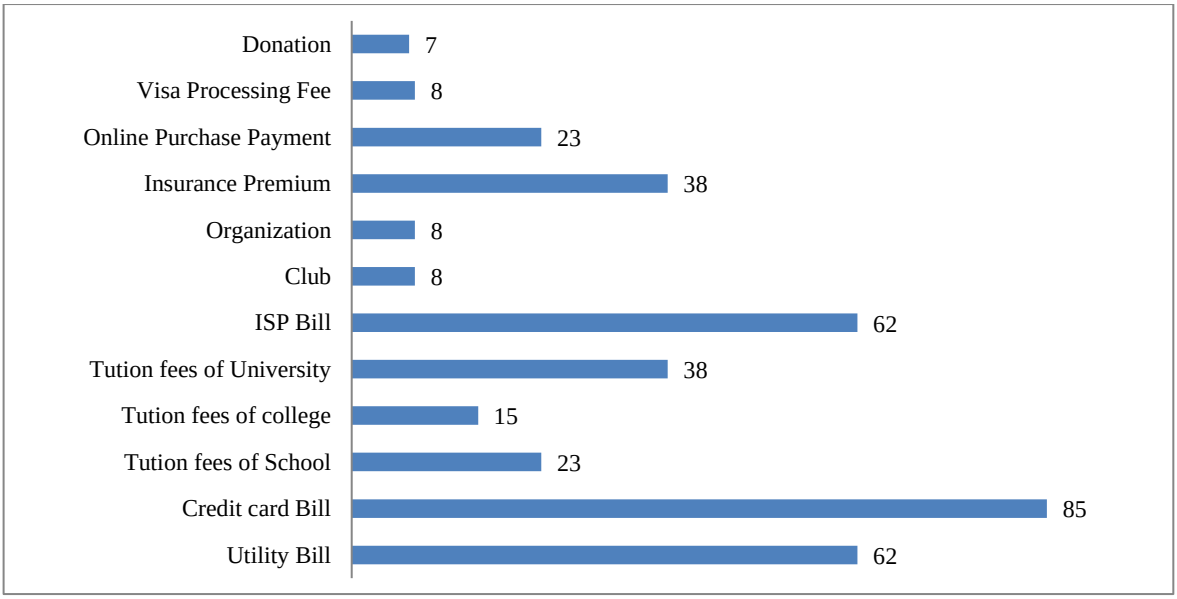


Source: BIBM Survey

2.2.1.4 Internet Banking Payment Services

Internet Banking provides round the clock (24×7×365) access to account and service. It increases speed and efficiency. It also facilitates online bill payment for their customers. Quite a high percentage (85%) banks received credit card bills through Internet Banking; 62% facilitated payment of both utility and ISP bills; about 38% facilitated payment of Insurance premium and tuition fees of Universities; and about 23% banks provided online merchant payments (e-commerce, m-commerce, f-commerce, etc.) for their customers (Figure-14). The same percentage (8%) of banks provided some vital services such as payments of visa processing, organization and club fee, etc. The lowest portion of banks (7%) received donations, using Internet Banking payment gateway.

Figure 14: Internet Banking Payment Services Provided by Banks (% of Banks)

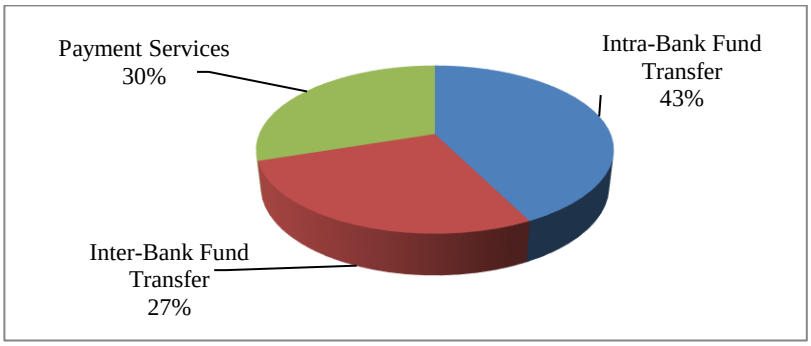


Source: BIBM Survey

2.2.1.5 Distribution of Internet Banking Transactions

In 2019, 30% Internet Banking transactions were related to payment services, 43% to fund transfer within same bank, and 27% with transferring funds to other banks (Figure-15).

Figure 15: Distribution of Internet Banking Transactions



Source: BIBM Survey

2.2.2 Internet Banking Services: Corporate

It is simultaneously important for banks to provide Internet Banking services for corporate customers. Table-10 shows that about 92% banks in our country did not able to accept the request for printed certificate (Solvency, Tax etc.).

Table 10: Internet Banking Services: Corporate Customers (% of Banks)

Services	Yes	No
a) Bulk Fund Transfer (Salary, Benefits, Dividend, etc.) within bank	38.5	61.5
b) Bulk Fund Transfer (Salary, Benefits, Dividend, etc.) to other banks using RTGS/BEFTN/NPSB	30.8	69.2
c) Account to Account Transfer Within Bank	69.2	30.8
d) Account to Account Transfer Other Bank using RTGS/BEFTN/NPSB	46.2	53.8
e) Cheque Book Request	23.1	76.9
f) Request for Pay Order	15.4	84.6
g) Request for Demand Draft	15.4	84.6
h) Request for Printed Statement	7.7	92.3
i) Request for Printed Certificate (Solvency, Tax, etc.)	7.7	92.3
j) Duty Payment	7.7	92.3
k) Direct Debit Instruction	23.1	76.9
l) Cross Border Payment (Remittance, etc.)	7.7	92.3
m) Download Account Statement/Transaction Details/History	76.9	23.1
n) Account Overview	75.0	25.0
o) Import Payment and Finance	7.7	92.3
p) Export Receipt and Finance	7.7	92.3
q) International Bank Guarantee	7.7	92.3

Source: BIBM Survey

Also, emphasis must be given on services like request for printed statement. Facilities such as duty payment, cross border payment, import payment and finance, export receipt and finance, international bank guarantee, etc. are indispensable part of any business. So, it is expected by corporate houses that they can perform these operations through Internet Banking. If banks can provide these services to their corporate clients, it will be beneficial for both of them. However, less than 8 percent banks provided these services for their customers. So, banks should come forward to offer these facilities to business clients, which will certainly increase their market penetration. 76.9% banks allowed their corporate customers to download their account statement, and 75% banks provided account overview service which bear a positive sign for the expansion of Internet Banking.

2.2.3 Transaction Cost

Banks play a vital role in developing the economic and social conditions of a country. The major share of the profit of banks generally comes from spread. But, the profitability of banks is under tremendous pressure because of continuous shrinking of spread. It becomes important for banks to reduce cost per transaction for increasing spread that, in turn, will increase the profitability of banks. Use of technology in banks reduces the cost. Banks have realized that cost of transaction drastically reduces from brick and mortar structure of the branch to online delivery channels like ATM, POS Terminal, Mobile Phone, Internet, etc. Each of these channels has its own specific advantages in terms of improved customer service and reduced transaction cost. The basic difference between online banking and traditional banking is that, in traditional banking the customer has to visit the branch for the basic banking needs viz. withdrawal or deposit of cash, transfer of funds, statement of accounts etc. Online banking saves customers' time. Bank also enjoys lower overheads, establishment, premises and maintenance costs, which results in reduction of transaction cost. Low transaction cost is one of the main reasons why online banking is getting popularity.

Table 11: Average, Minimum and Maximum Transaction Cost of Different ADCs

Cost Per Transaction	Branch	ATM	MFS*	Agent Banking	Internet Banking	App Banking
Average	134.80	38.8	18.50	98.50	17.00	26.40
Minimum	85.00	25.00	11.50	59.00	2.80	4.75
Maximum	334.00	49.00	28.0	158.00	32.00	42.00

Source: BIBM Survey
*Per 1000 Tk.

Table-11 shows the total cost per transaction of different delivery channels of banks (in case of Agent and Mobile Banking, cost of agents are included) at the end of 2019. The cost per transaction was highest in bank branch, followed by Agent Banking outlet. Though the

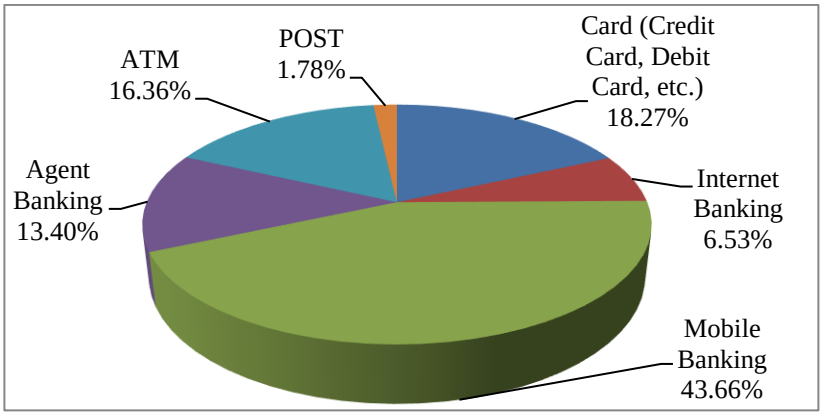
average cost per transaction of a branch is Tk. 134.8, it ranges from Tk. 85 to Tk. 334. Other delivery channels like ATM, MFS, Internet Banking and App Banking had lower transaction costs compared to branch or agent banking due to limited or no interaction of bank employees. By comparing all these costs, we can say that the transaction cost of Internet Banking is the lowest among all ADCs.

2.3 Market Penetration

2.3.1 Market Share of Internet Banking

Figure-16 illustrates the distribution of volume of ADC transactions in 2019. Mobile banking crossed all other ADCs covering more than 43 percent of total volume of transactions, with Internet Banking only 6.53% of the pie, and POST only 1.8 percent (Figure-16). It is clear from the figure that banks have to think more progressively and innovatively about this channel if they want to popularize this ADC among mass people.

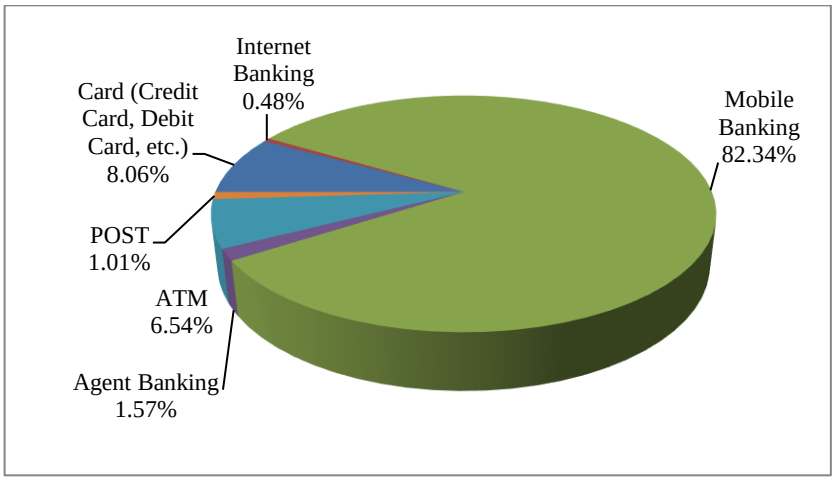
Figure 16: Distribution of the Volume of ADC Transactions



Source: BIBM Survey

In 2019, mobile banking dominated the market with more than 82 percent of total transactions, with Internet Banking transactions far below one percent of total ADC transactions (Figure-17). That indicates people are not using Internet Banking at expected level and market share of this channel is very insignificant. In case of ADC transactions, transactions done by card, POST, ATM and Agent banking together were far behind compared to mobile banking.

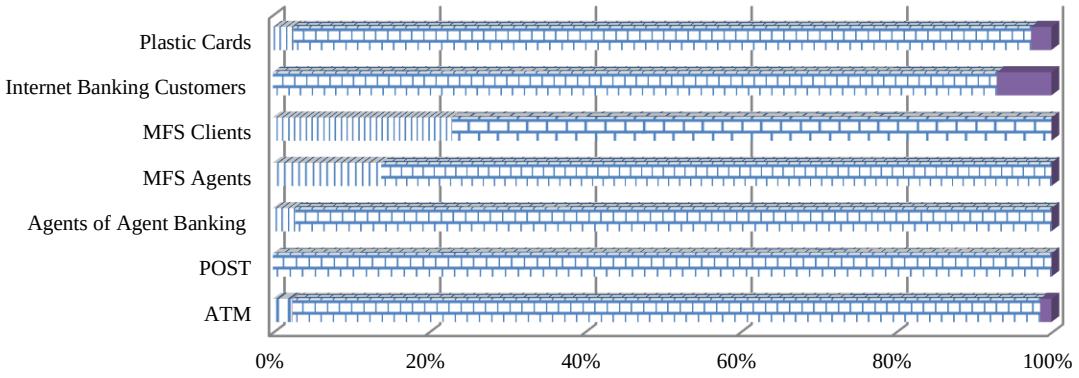
Figure 17: Distribution of ADC Transactions



Source: BIBM Survey

The market share of all types of ADCs was mostly dominated by Private Commercial Banks (PCBs). SOCBs and SDBs were not offering POST and Internet Banking services, though they had huge customer base. In fact, SDBs were lagging far behind than other banks in providing ADC services. In case of offering Internet Banking service, PCBs were in the leading position compared to FCBs (Figure-18).

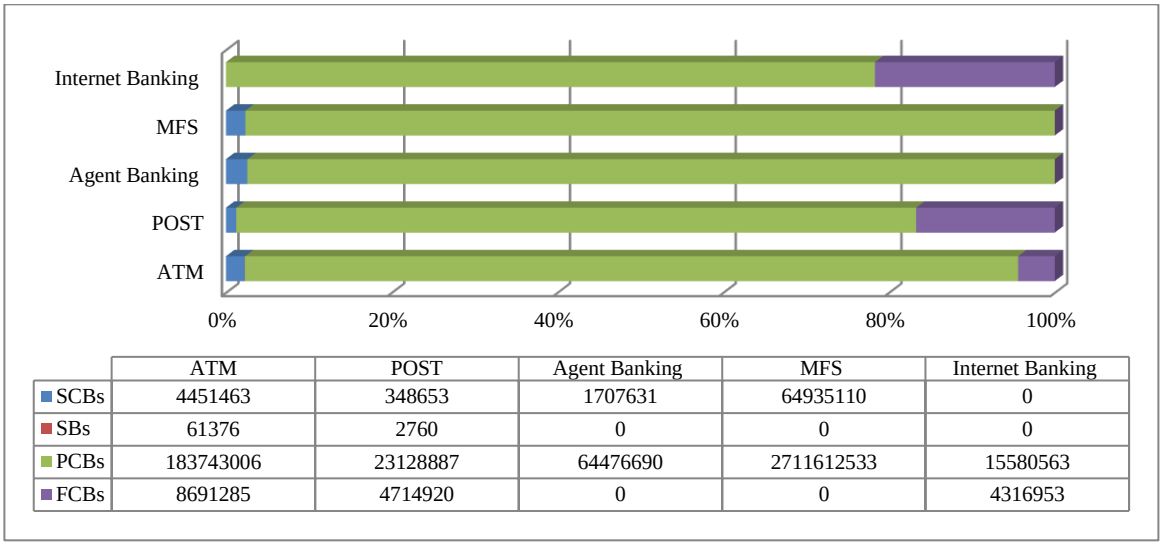
Figure 18: Market Share: Number of ADCs by Categories of Banks



	ATM	POST	Agents of Agent Banking	MFS Agents	MFS Clients	Internet Banking Customers	Plastic Cards
SCBs	276	0	263	139650	21329452	0	580170
SBs	6	0	0	0	0	0	7703
PCBs	10663	65683	8917	863355	71250816	2642296	20992026
FCBs	161	0	0	0	0	199418	580424

Source: BIBM Survey

Figure 19: Market Share of ADC Transactions by Categories of Banks

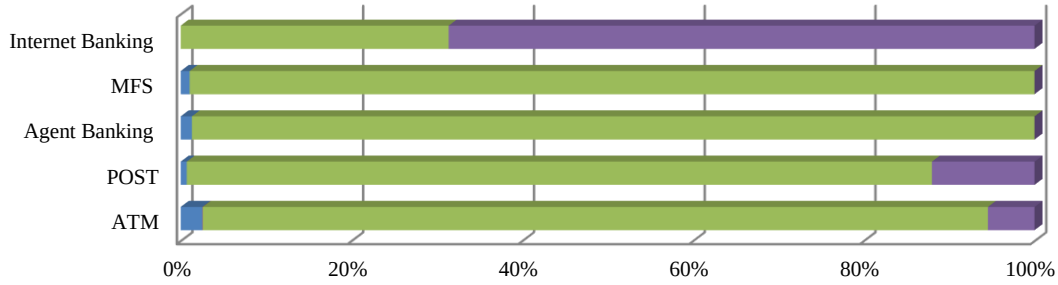


	ATM	POST	Agent Banking	MFS	Internet Banking
SCBs	4451463	348653	1707631	64935110	0
SBs	61376	2760	0	0	0
PCBs	183743006	23128887	64476690	2711612533	15580563
FCBs	8691285	4714920	0	0	4316953

Source: BIBM Survey

Since SOCBs and SDBs did not have any POST and a very small proportion of ATMs, they accounted for only small portions of transactions (Figure 19). These transactions were done in other bank's POST by using SOCBs and SDBs credit, debit and prepaid cards. Number of transactions in MFS was quite high compared to other ADCs transactions. With respect to transactions, PCBs dominated in all delivery channels. Almost fourfifths of Internet Banking transactions were done by PCBs and rest by FCBs. SOCBs and SDBs had no Internet Banking facilities. Majority of the transaction of ATMs were carried out by PCBs, though a very little portion was carried out by PCBs, SDBs and FCBs.

Figure 20: Market Share of ADC's Volume of Transactions (Crore Tk.) by Categories of Banks



	ATM	POST	Agent Banking	MFS	Internet Banking
SCBs	4067.6	107.7	2513.1	4910.9	0.0
SBs	61.3	0.8	0.0	0.0	0.0
PCBs	146642.0	13371.7	188920.7	464132.7	22452.4
FCBs	8702.7	1841.9	0.0	0.0	49108.6

Source: BIBM Survey

In case of market share of ADC's volume of transactions, MFS had the lead, followed by Agent Banking (Figure-20). Except Internet Banking, majority of the market share, considering volume of transactions, goes to PCBs. As Internet Banking for corporate customers were highly facilitated by FCBs, portion of volume of transaction was very high compared to other ADCs for this group. Considering these FinTech channels, the market share of SOCBs and SDBs with respect to volume of transactions was significantly very low. Government may take initiatives to increase the market share of state-owned banks for giving latest technological services to its large customer base.

2.3.2 Marketing Initiatives taken by banks to Grow Internet Banking

Table-12 summarizes the marketing initiatives that were taken by banks to build a resilient market position and business development for Internet Banking.

Table 12: Marketing Initiatives taken by Banks

Marketing Steps taken by Banks	% of Banks
Send SMS and e-mail to current and prospective customers regarding Internet Banking product, services and offerings	77
Publish Internet Banking related information through banks' Website and Social Media	58
Banners display Internet Banking related messages in branches	39
Marketing through call center (Telemarketing)	48
Advertising in Radio, TV, Print Media, YouTube, etc.	19
Disseminate information through Live Chat/Chat-Bot/Help-Desk	11

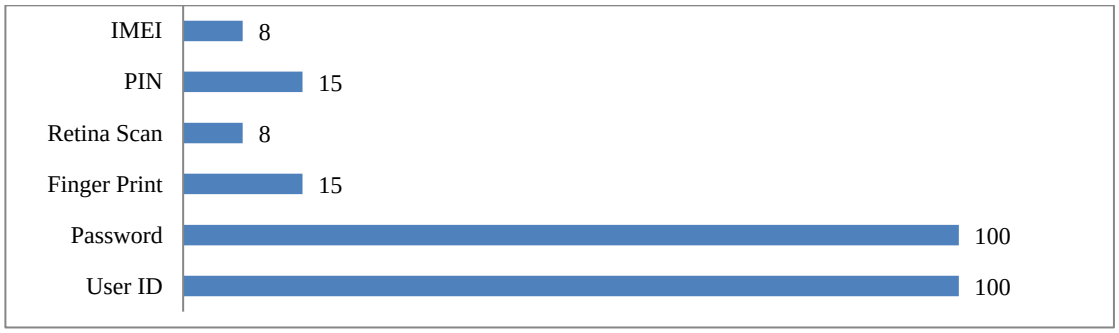
Source: BIBM Survey

2.4 Internet Banking Security

2.4.1 Login Authentication

Customers have to follow some authentication methods when they want to access their Internet Banking accounts, using PC, Laptop, Tab or Smart Phone. Banks generally follow a combination of authentication methods like IMEI, PIN, retina scan, finger print, password and user ID to identify a valid user. All banks offering Internet Banking services used password and user ID for basic login authentication (Figure-21). Also, PIN (15%), finger print (15%), IMEI (8%) and retina scan (8%) were used by banks as additional verification process. In Bangladesh, 23% banks used a combination of three factor authentication methods (3FA), which is a very good practice, though 77% banks used 2FA to verify a user.

Figure 21: Login Authentication Methods from PC/Laptop/Tab/Smart Phone

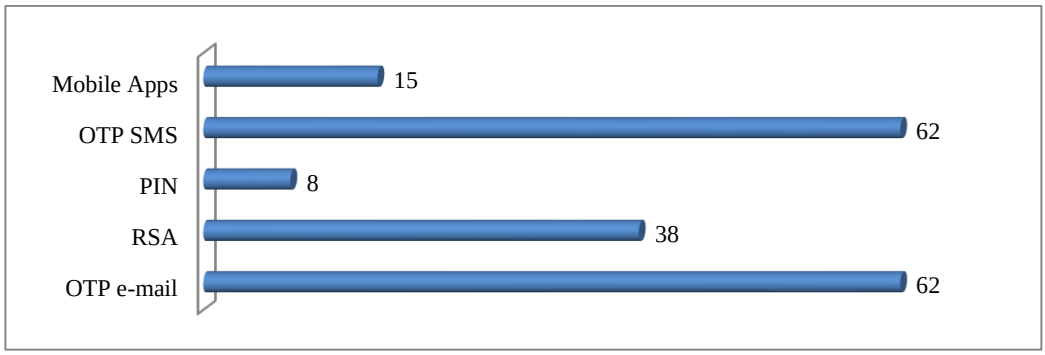


Source: BIBM Survey

2.4.2 Methods for Authorization

Various methods (PIN, OTP, etc.) are used by banks for authorization of customers' transaction. In this regard, options are given to the customers to select one or more media (e-mail, SMS, Apps, etc.) to get the OTP. Accordingly, banks send OTP through these media to verify customer's transaction. OTP through SMS or via e-mail were the two most popular methods used by Bangladeshi banks (Figure-22). 62% banks used these techniques as a medium for transaction authorization. About 38% banks provided RSA hardware token or RSA app to generate OTP by the customers themselves for authorization of transaction. Another 15% banks used banking app to receive OTP and a very low percentage of banks (8%) also used PIN for transaction authorization.

Figure 22: Methods for Authorization of Internet Banking Transaction (% of Banks)

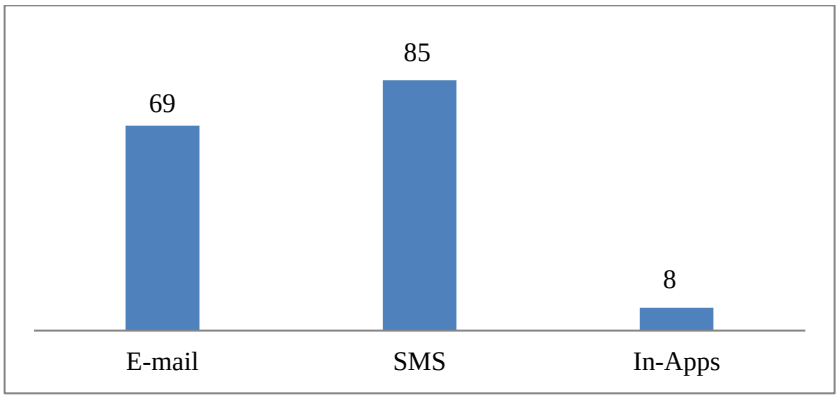


Source: BIBM Survey

2.4.3 Methods of Notification

After successful completion of a transaction, a notification is sent to the customer of the corresponding bank about the transaction. The methods used for notification are: sending e-mail, SMS, and Banking Apps. A large number of banks (85%) notified their customers by means of SMS, 69% used e-mail, and only few banks (8%) used Banking App for notification (Figure 23).

Figure 23: Methods for Notification of Transaction (% of Banks)

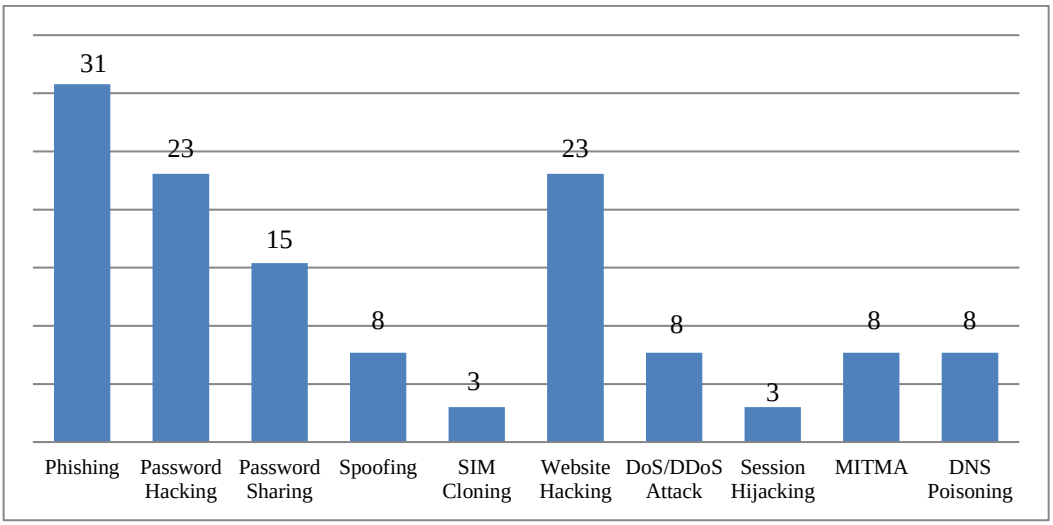


Source: BIBM Survey

2.4.4 Security Threats

Banks have been facing various security threats while conducting Internet Banking. In case of 31% and 23% banks, security was violated due to Phishing and Password Hacking, respectively (Figure-24). About 15% banks faced security threats as a result of Password Sharing by customers, and 8% banks faced the problem of Spoofing, DoS/DDoS Attack, MITMA and DNS poisoning. Only 3% banks faced the problem of SIM Cloning (to hack OTP) and Session Hijacking. These security threats need to be reduced to prevent fraudulent transactions.

Figure 24: Security Threats Faced by Banks Related to Internet Banking

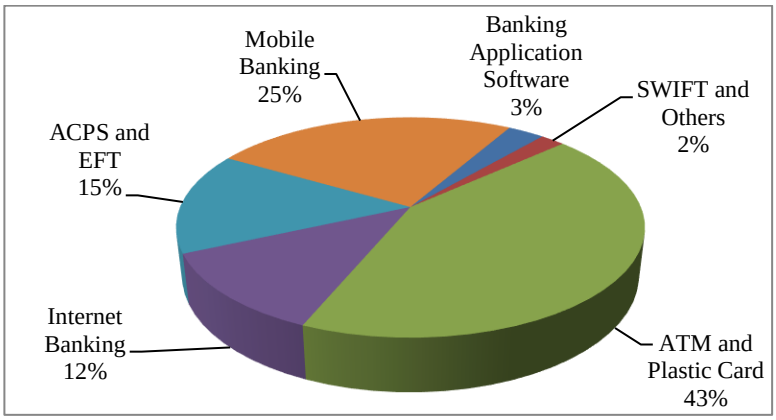


Source: BIBM Survey

2.4.5 Frauds in Internet Banking: Some Cases

To observe and study the status of frauds, we considered 50 cases as sample where fraud happened through electronic delivery channels in Bangladeshi banks. The sources of these cases were Bangladesh Bank, commercial banks, daily newspapers, victims and employees of different banks. The highest number of frauds (43%) were committed through ATM and Plastic Card transactions (Figure-25). Around 25% deceptions happened in mobile banking transactions. Internet Banking was in third place (around 12%), and using banking application software (only 3%).

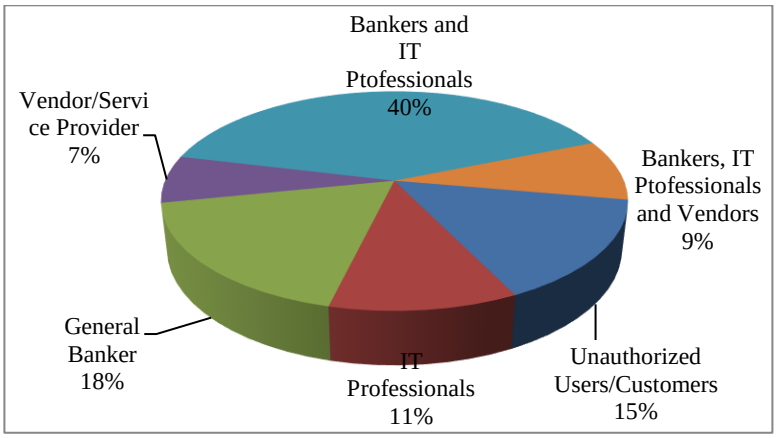
Figure 25: Categories of Frauds



Source: BIBM Survey

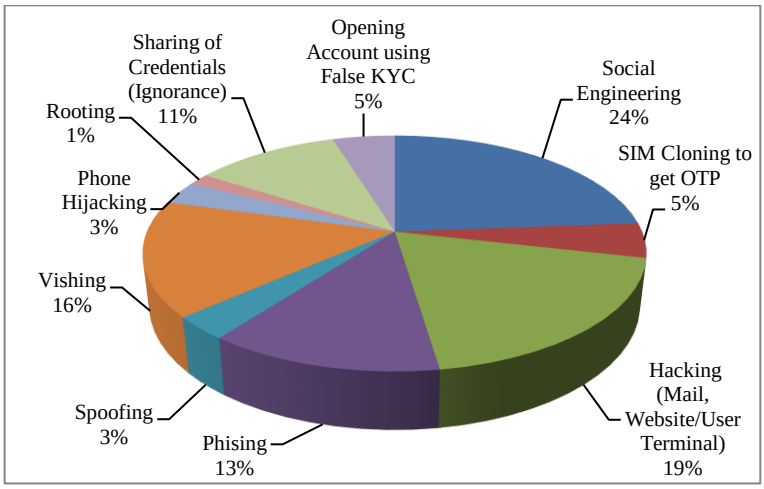
Figure-26 shows that in banks a large number of financial crimes (40%) were committed jointly by general bankers and IT professionals. In 18% of fraud cases, individuals who worked in the banking industry generally were implicated, while 11% of the cases involved individuals who worked in information technology (IT). In some cases, unauthorized external users committed banking crimes (15%).

Figure 26: Categories of Fraudsters



Source: BIBM Survey

Figure 27: Reasons of Frauds



Source: BIBM Survey

The above figure (Figure-27) shows percentage of reasons behind each fraud. It is obvious from the figure that the most prevalent cause was 'Social Engineering'. In 24% fraud cases, hackers manipulated people psychologically to perform actions or reveal personal information. The techniques of hacking of mail, website or user terminals were used in 19% cases. Then frauds were committed through 'Phishing' in 13% crime cases. It is the deceitful effort to get hold of secret information or data, like user name, password and credit card details or other delicate data, by imitating oneself as a trustworthy person in a digital communication. Like Phishing, Vishing is the falsified action of making phone calls or sending voicemails claiming to be from trustworthy companies to tempt people to disclose personal information. This modus operandi was used in 16% cases. Other types of frauds include, sharing of credentials (11%), phone hijacking (3%) etc.

One of the major threats of Internet Banking is fraudulent transactions. It is seen that about 17% banks have experience of fraudulent Internet Banking transactions. Fraudster used various techniques like e-mail hacking, social engineering, SIM cloning, etc. to get OTP. It is an alarming issue which hinders the trust and acceptance of customers in using Internet Banking. Other security threats that are associated with Internet Banking are unauthorized access of ID and Password, session hijacking, server hacking, system failure, etc. The survey analyzed some incidents that occurred in last five years.

Box 1: Fraud by Vishing/Call over the Phone (Date: 05-03-2020)

Mr. 'X' received a call from someone who is posing as a bank official. That person asked him to share his banking credentials. The account holder 'X' did so in good faith and shared his banking credentials (like debit card no., CVV, expiry date and PIN) as well as email account access credentials with that suspected caller. He also shared OTP with the fraudster that was sent to his mobile phone during password change. Subsequently, the fraudster accessed into his account and email using the credentials and collected OTP and transferred Tk. 58,000 from Internet Banking account of Mr. 'X' to fraudster's bKash account.
Complaint Source: Call Center.
Reason behind Fraud: Phishing call over the phone.
Dispute Management: The bank refunded the fund to the genuine customer.
Measurement Taken: The bank restricted their Internet Banking services and blocked OTP on email for online registration and password change. Onward, OTP through email is allowed only for transaction.

Box 2: Fraud by Phone Hijacking, Rooting (Date: 19-05-2020)

Mr. 'Z' stored all of his account and email credentials into a third party provided android application. And the credentials have been compromised from this third-party app. Customer's PIN, email password and other credentials are compromised and the fraudster got the temporary password and the OTP that was sent to Z's registered email address during this process. The fraudster also entered the card PIN successfully while changing the password of Internet Banking account. Subsequently, the fraudster accessed into his account and made fund transfer of Tk. 60,000.
Complaint Source: Call Center.
Reason for Fraud: Phone hijacking, rooting.
Dispute Management: The bank refunded the fund to the genuine customer.
Measurement Taken: The bank restricted Internet Banking registration process on rooted device and any software that have root access.

Box 3: Fraud by Colleague (Date: 06-03-2020)

A colleague of Mr. M collected Mr. M's account information; debit and credit card (PAN, PIN, expiry date etc.) credentials. The same person also opened an email address by his name abusing official domain access rights. Then fraudster registered in online banking using the credential of Mr. M and conducted the transactions from compromised Internet Terminal (Tab). The amount involved was Tk. 1,25,910.
Complaint Source: Call Center
Reason for Fraud: Social Engineering and ignorance of the user.
Dispute Management: The bank refunded the fund to the customer.
Measurement Taken: The bank restricted their Internet Banking services and blocked OTP on email for online registration and password change. Only email password is allowed for transaction.

Box 4: Fraud by Relative using Social Engineering (Date: 30-05-2020)

Mr. 'Y' shared his Internet Banking credentials with his close relative. One day when he left his Internet Banking device unattended, the relative used that device to sign in to Internet Banking platform and did an unauthorized transaction to transfer Tk. 20,000 to his (relative's) bKash account. The fraudster got the OTP from Y's device and completed the transaction from Mr. Y's account.
Complaint Source: Complaint Cell
Reason for Fraud: Social Engineering and ignorance of the user.
Dispute Management: Bank did not take any responsibility and advice the customer not to share credentials with others and keep his device safe from unauthorized access.
Measurement Taken: The Bank started to send security EDM and SMS to customer to aware them and take necessary steps to protect account

Box 5: Fraud by a group of Fraudsters using SIM Cloning

A group of fraudsters opened a false account and collected a duplicate SIM from an operator's SIM replacement shop that was registered in the name of Mr. 'W'. Using that SIM they got the OTP and necessary banking credentials of Mr. 'W'. After that they transferred an amount of Tk. 5 Lacs from Mr. W's account to their fraudulent account and withdrew the money immediately. Later they flew away and even with the KYC the owner of the account could not be traced.

Box 6: Fraud by Relative

One of the customers raised complaints that his Internet Banking profile had some unusual mobile recharge transactions that he didn't perform. The compliance took over the complaint and investigated the transaction incidents. The bank found that the login terminal and details are different than the customer used to do. After more investigation, the team found that the customer shared his credentials (username, password and transaction PIN) with his brother-in-law who eventually performed those unusual transactions.

Measurement Taken:
Two factor authentication in every New Login. Here 'New' means login from a new terminal or device from where the customer never successfully signed in before. And for more, two factor authentication is used to validate a login after every 3 months while using the same device or terminal. When the incident happened, Mobile recharge transactions were done only by validating the Transaction PIN (TPIN). After the incident, the bank allows a small velocity of transaction (like Tk. 1000 per day) with TPIN only, and for transacting more amount system challenges with two factor authentication.

Box 7: Fraud by Compromising Data and/or Hacking Email

a) From April 19, 2019 to July 28, 2019, total 12 (twelve) account holders reported regarding unauthorized transactions took place from their accounts to various accounts (bKash, Rocket, Mobile recharge and others) through Internet Banking. As per investigation, there was a possibility of compromising data and/or hacking email for making those transactions though OTP was sent to customer's declared email address. Total amount involved was Tk. 4,55,782.

b) Tk. 1,20,000 was transferred from two accounts of one customer to MFS accounts through Internet Banking on April 13, 2019. Fund was transferred to eleven bKash and one Rocket account. Though One Time Password (OTP) was sent to complainer's registered e-mail address, there was a possibility of compromising data and/or hacking email.

Box 8: Tk. 40,50,000 Withdrawn Using Internet and Mobile Banking Technology

Two fraudsters planned to withdraw money from some Internet Banking account. At first by applying Internet Phishing and Social Engineering Technology they got the ID and Password of different account holders of some foreign and local private banks providing Internet Banking facilities to the customers. After getting the ID and Password they did handshake with some executives who were working temporarily in the IT division as a data entry operator to enter KYC information. The trio then replaced the mobile numbers of the customers' with their own number so that customers can't get the SMS alert messages. In the mean time they tried several times to open fake account both in foreign and local bank. Fortunately they opened several fake accounts in the local bank but failed to open in the foreign bank. Then they started their operation and transferred an amount of Tk. 40 lac from different accounts within three days. A total number of 160 transactions having an amount of Tk. 25,000 each were made by the fraudsters. They withdrew the money by Debit cards through ATMs.

For the foreign-bank accounts they applied another technique. One was sitting on an Internet terminal and another was waiting in an ATM booth. The fraudster who was waiting in the ATM booth requested another customer to help him to face a medical emergency. He said that his card got captured by the machine unexpectedly but he needs a total of Tk.50,000 just now to meet up the medical emergency of his mother who is in a nearby hospital! He requested the customer to give him the account number so that his brother can transfer that amount immediately and he can get the amount by using the customers' debit card. The customer agreed to help him. The fraudster then made a phone call to other fraudster who was sitting in front of Internet Banking terminal waiting for the green signal. He transferred the money stealing from a customer's account. The customer got the SMS alert and informed the bank immediately. But nothing could be done! Police arrested the customer but released him knowing the details with CCTV evidence. He was in a trap by the fraudsters! None can be identified still today.

Box 9: Fraud through Phishing (I-banking)

Mr. Sajid Hasan (name changed) is a middle aged financially solvent businessman who isn't very tech savvy. Mr. Sajid received an e-mail, which appeared to be from his bank informing him that they are updating their database and they need the customers to go to the bank's website and provide the account information. For the convenience of the customers, they provided a link in the mail. The mail was very convincing as it contained the bank logo and other things like the actual mails of the bank.

Mr. Sajid, being unaware of phishing scam, followed the link and provided his account number and other details in the website. The website as not the original website of the bank of course though it looked like the actual one. Such websites are well known as mirror website. However, as soon as he provided the account details, the fraudsters started transferring funds from his account. Fortunately Mr. Sajid used to check his bank statement online regularly and noticed the unusual withdrawals. He notified the bank instantly to freeze his account realizing that he had become the victim of a phishing scam.

2.4.6 Dispute Management

Dispute Management cell for Internet Banking symbolizes the bank's sincerity to manage the disputes. This survey indicates that about 61% banks have dispute management cell for resolving conflict arises from Internet Banking services which is a good achievement regarding dispute management. But the rest of the 39% banks should give proper emphasis to develop a dispute management cell for Internet Banking. Average, minimum and maximum persons engaged in these cells are 3.6, 1 and 9, respectively. In 2019, the average, minimum and maximum number of Internet Banking related disputed transactions were 2054.8, 3 and 11370 respectively. Proper steps should be taken to minimize the total number of disputed transactions.

2.5 Customers' Satisfaction on Internet Banking

A customer satisfaction is an abstruse and abstract concept. Actual state of satisfaction varies from person to person, product to product and service to service and depends on a number of psychological, economic and physical factors. In banking industry, one of the major elements of the customer satisfaction is the quality of services. Moreover, if customers are not satisfied, it is very tough to expand the banking business. However, we feel that, there may be some likelihood of gaps between customers' hopes and actual perception of service quality, brand perception and perceived value in Internet Banking.

2.5.1 Measurement of Customers' Satisfaction

It is seen that only 31% banks conducted survey among customers to get feedback about their Internet Banking services and customers' satisfaction. That means 69% banks did not feel the necessity to be acquainted with their customers' feedback, which is not a good practice at all. So, this is a very disgruntled scenario and banks must focus on conducting surveys

among customers about Internet Banking service quality. Therefore, this section is introduced to detect the major factors that affect customers' satisfaction in Internet Banking in Bangladesh. The following table describes the constructs with description that are used to estimate the satisfaction of customers'. Moreover, overall customers' satisfaction and loyalty towards the bank was also measured here.

Table 13: Construct and Description

S. No.	Construct	Description
1	Availability of Internet Banking Services	Latest equipment and Online (Web) facilities: Internet Banking Transactions, SMS Notifications, Electronic Fund Transfer, Online Bill Payment, Call Center Support, etc.
2	E- Requirement	Scope of services offered, Availability of Round the clock Internet Banking Services, Digitalization of Business Information, Variety of Services, etc.
3	Accuracy	Accurate Internet Banking Services through WWW.
4	Efficiency	Immediate and quick transaction and check out with minimal time: speed of clearing, enquiry, getting information, money transfer, response, etc.
5	Security	Building customer confidence through trust, privacy, believability, truthfulness, and security. Guarantee from fear about money losses, fraud; PIN and password theft; hacking etc.
6	Responsiveness	Problem management, prompt and timeliness service, helping nature, employee courtesy, recovery of PIN, password and money losses.
7	Easy Operations	Easy use of the delivery channel (Web, SMS, e-mail, OTP, PIN, biometric, etc.)
8	Convenience	Customized services, anywhere and anytime banking, appropriate language support, etc.
9	Cost Effectiveness	Price, Fee and Charges: commission for fund transfer, interest rate, clearing charges, bill collection and payments' fee, transaction charges, processing fees etc., Price, charges and commissions should be less for Telecommunication Company and Internet service providers.
10	Problem Handling	It refers to problem solving process regarding Internet Banking services
11	Settlement of Grievances	It refers to recover the losses regarding to problems and inconvenience occurred in using Internet Banking delivery channels.
12	Contact and Help Desk Support	Communication: Bank to customer or customers to bank via e-mail, SMS, Phone, interactive website, call center, social media, chat-bot, etc.
13	Brand Perception	Overall perception of customers according to commitment given by bank for banking services.
14	Perceived Value	Consolidated perception from banking service in term of perceived quality and money spent for getting banking services.

Source: Literature Study

Table-14 summarizes the customers' satisfaction regarding online banking with respect to different construct (ex. availability, accuracy, security, etc.). Satisfaction is calculated by the following formula for each construct.

$$Satisfaction\ (\%) = \frac{\sum_{i=1}^{n} S_i}{n \times HS} \times 100$$

Here, $\sum_{i=1}^{n} S_i$ is the sum of scores of n respondents for each question/construct to understand the satisfaction level. *HS* is the 'highest score' assigned for each question (highest score 5 is assigned for excellent service or if the respondent strongly agree with the opinion). Actually, we have calculated the satisfaction level of customers for each question as a percentage of maximum satisfaction a customer expects from a bank. In this study we have used five-point Likert Scale: 'Very Poor: 1, Poor: 2, Good: 3, Very Good: 4, Excellent: 5' or 'Strongly Disagree: 1, Disagree: 2, Neutral: 3, Agree: 4, Strongly Agree: 5', where necessary.

Table 14: Mean and Satisfaction Score for All Banks

S. No.	Construct	Mean	Satisfaction (%)	Expectation Gap	Comments
1.	Availability of Internet Banking Services	3.77	75	25	Critical
2.	E- Requirement	3.41	68	32	Highly Critical
3.	Efficiency	3.69	74	26	Critical
4.	Accuracy	3.98	80	20	Less Significant
5.	Security	3.05	61	39	Highly Critical
6.	Responsiveness	3.46	69	31	Highly Critical
7.	Easy Operations	3.42	68	32	Highly Critical
8.	Convenience	3.34	67	33	Highly Critical
9.	Cost Effectiveness	3.67	73	27	Critical
10.	Problem Handling	2.81	56	44	Highly Critical
11.	Settlement of Grievances	2.62	52	48	Highly Critical
12.	Contact and Help Desk Support	2.77	55	45	Highly Critical
13.	Brand Perception	3.14	63	37	Highly Critical
14.	Perceived Value	3.43	69	31	Highly Critical
15.	Overall Customer Satisfaction	3.05	61	39	Highly Critical
16.	Continue with this Bank	3.45	69	31	Highly Critical
17.	Recommend this Bank to Others	2.78	56	44	Highly Critical

Source: Authors' Calculation

From the above table highest satisfaction is seen in case of accuracy of operations (3.98 out of 5) which implies that current Internet Banking infrastructure helps bankers to reduce operational errors. Lowest satisfaction is found in case of handling grievances (2.62 out of 5). That is customers are not getting right and quick solution when they complain for any

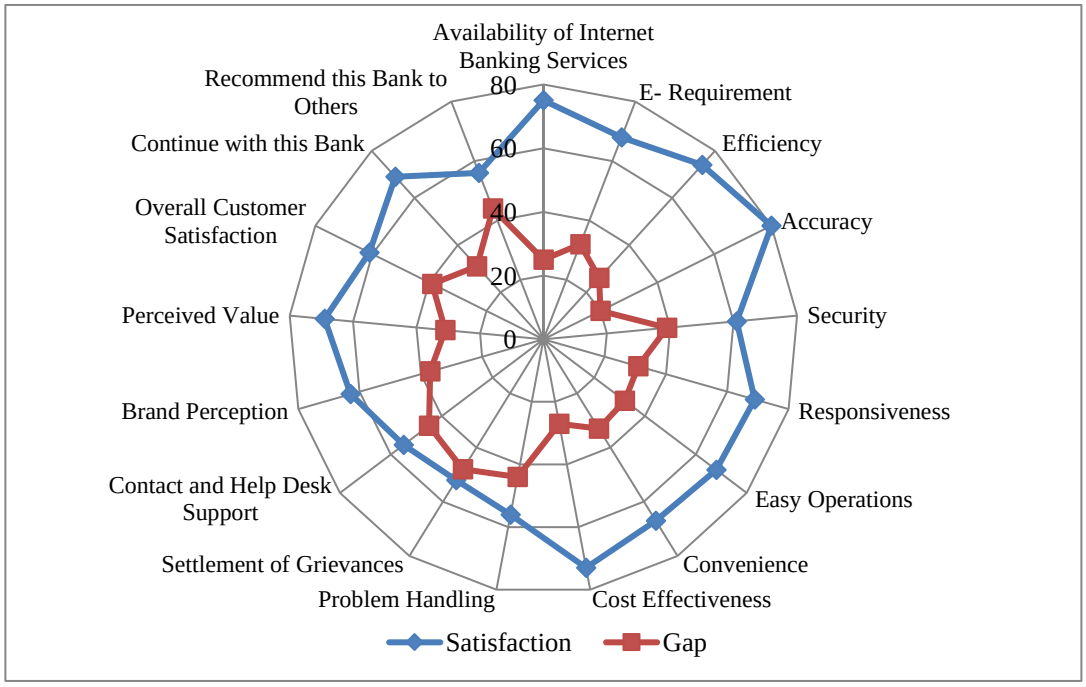
dispute. Moreover, overall customers' satisfaction 61% implies that there are enough scopes to develop good customer relationship by satisfying them more.

However, with this level of overall satisfaction the customers would like to continue their relationship with the bank for the time being but they would disagree to recommend other customers to make a relationship with the respective bank. This might lead the customer to search a better bank in the long run putting questions regarding customer relation with the bank.

2.5.2 Gap between Highest Expectation and Current Service Quality

Gaps were assessed purely on the basis of the percentage of satisfaction values for each question/parameter comparing with a reference score '100' which was considered to be the maximum and that any organization should like to achieve for excelling. A service gap of close to 30 and more than 30 was considered to be 'highly critical' area for the improvement of the performance dimensions. A service gap of between less than 30 and more than 20 was considered as 'critical' and further needs for improvements and service gap below 20 is treated as 'less significant'. Figure-28 shows the gap between the percentage of satisfaction and highest expectation (100) of customers' regarding Internet Banking services. This will help the management to reduce the gap between the demand of customers and existing available facilities.

Figure 28: Gap between Expectation and Current Service Quality



Source: BIBM Survey

2.5.3 Factor Analysis

In this section a factor analysis is done to see what factors actually affecting satisfaction of customers regarding online banking. Here, 14 response items (Table-16) among 17 items (Table-14) were used.

Presence of nonzero correlation is ensured by Bartlett's Test of Sphericity which is significant at the 0.00001 level (Table-15(a)). The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.714 which exceeds there recommended cut-off level of 0.5 and individual measures were all well above this cut-off level. It is clear that the fundamental requirements of factor analysis are ensured by this data set.

Table-15 (a)

KMO and Bartlett's Test		
	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.714
Bartlett's Test of Sphericity	Approx. Chi-Square	934.661
	df	136
	Sig.	0.00001

Table-15 (b)

Total Variance Explained			
Component	Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	2.992	23.013	23.013
2	1.894	14.573	37.586
3	1.706	13.12	50.706
4	1.17	9.003	59.708

Extraction Method: Principal Component Analysis.

Using the principles of an eigenvalue greater than 1 and Scree Plot four factors are clearly identified. These four factors accounted for 59.708% of the total variance (Table-15(b)). Also a Varimax Rotation with Kaiser Normalization was performed as a common practice to attain simpler and ideally more meaningful factors.

Table 16: Component Matrix

	Rotated Component Matrix			
	Component			
	1	2	3	4
Availability of Internet Banking Services	**0.839**	0.179	0.060	0.471
E-Requirement	**0.742**	-0.005	0.110	0.039
Efficiency	0.278	**0.688**	0.142	0.002
Accuracy	**0.675**	0.052	0.011	0.249
Security	0.681	**0.765**	0.059	0.101
Responsiveness	0.092	**0.761**	0.031	0.260
Easy Operations	0.166	**0.646**	0.378	0.170
Convenience	**0.615**	0.332	0.138	0.500
Cost Effectiveness	0.088	0.095	**0.742**	0.095
Problem Handling	0.067	0.174	0.167	**0.772**
Settlement of Grievances	0.430	0.336	0.052	**0.741**
Contact and Help Desk Support	0.145	0.011	0.168	**0.681**
Brand Perception	0.021	0.147	**0.798**	0.086
Perceived Value	0.015	0.020	**0.857**	0.023

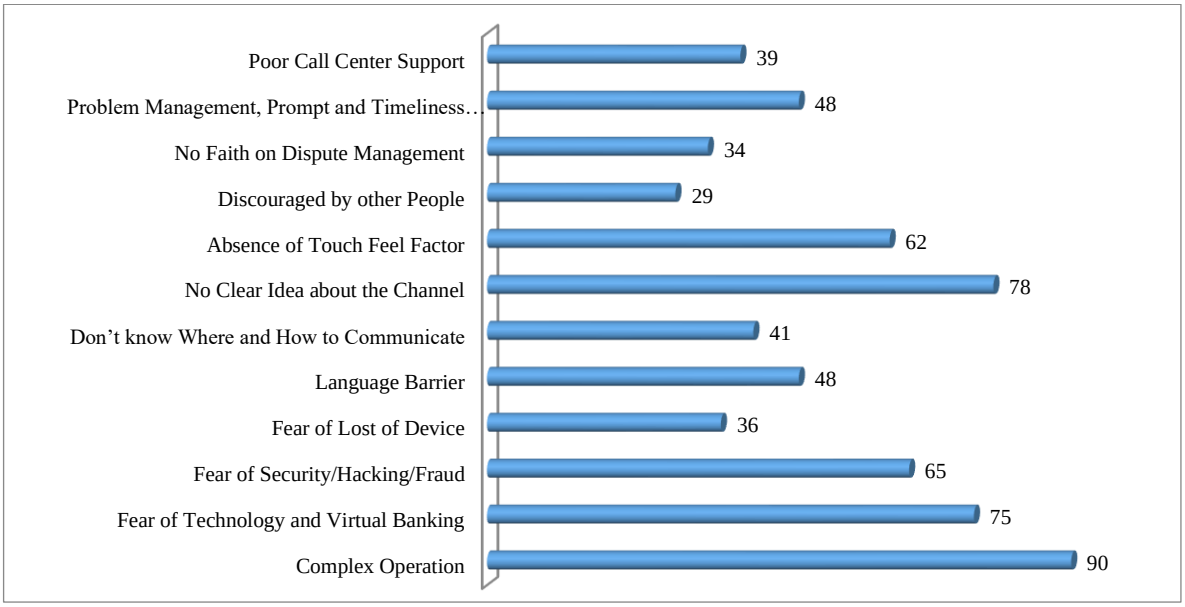
Source: Authors' Calculation, Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Clearly four factors are identified from the original 14 response items by examining the factor loadings as pointed in Table-16. These four factors represent different elements of online banking services. Factor-1 represents Accuracy, Convenience, E- Requirement and Availability; it is therefore labeled 'Digitization of Internet Banking'. Factor-2 represents Responsiveness, Efficiency, Easiness and Security; it is therefore labeled as 'Operational Efficiency'. Factor-3 represents Cost, Brand Perception and Perceived Value; it is therefore labeled as 'Post Purchase Behavior of Banks'. Factor-4 represents Problem Handling, Settlement of Grievances and Contact and Support. It is therefore labeled as 'After Sales Support.'

2.6 Trusts on Internet Banking

Customer trust is one of the factors that are analyzed by scientists and business analysts. Trust is being investigated as the originator of customers' loyalty and satisfaction. Commercial banks are not an exception, and trust is one of the drivers of clients' attraction. Regarding banking, Internet Banking is one of the most popular services provided by commercial banks, and this channel has a positive impact on the performance of banks. Psychological traits are vital in impelling the processes of cognitive perception that, in turn, influence usage intentions. Moreover, trust has a positive impact on customers' and Internet Banking relationships in the long-term perspective.

Figure 29: Reasons Why Prospective Customers Do Not Trust on Internet Banking (In %)



Source: BIBM Survey

Figure-29 depicts the reason why prospective customers do not want to trust on Internet Banking services. The most looming factor we have found is 'complex operation'. Around 90% individuals agreed with that factor. In our country people do not get proper Internet speed, especially in rural areas. If Internet speed is not fast customers face problems in every steps of Internet Banking. Also if they are not literate enough, then it is very tough for them to follow the instructions. People are also afraid of using hardware/software based token. Sometimes they forget their PIN or due to slow Internet speed the session time out happens, which leads them to a perplexed situation. Secondly, near about 78% people said 'they have no clear idea about Internet Banking', this means they don't know what features are actually available in this service and how they can be benefitted from this channel. If banks can do proper marketing in popular mediums (Facebook, YouTube), then it will be possible for them to reach the proper target groups and potential customers can be benefitted from this campaign. The third factor that impedes people from getting the service of this channel is 'fear of technology and virtual banking'. Literacy level is apparently low in our country and for that reason people are not that much tech savvy. They (approximately 75%) are afraid of availing any service that is highly technical and unknown to them. They face trouble in using the Internet, banks' website, smart phone etc. 'Fear of security/hacking/fraud' is another issue which hampers the growth of this channel in our country. People (around 65%) are afraid if they do anything wrong or misunderstand the instruction then what will happen to their money. Also fraud incidents that were happened previously and publicly known impede them from availing this service. Approximately 62% people do not like the virtual characteristic (absence of 'touch feel' factor) of this channel. This factor affects elderly people the most.

They want to go to the branch physically, which gives them a feeling of safety. About 48% people fear that linguistic problem will create a baffled situation for them. As many of them are not so much familiar with English language they want to avoid this channel willingly. Again, nearly 48% individuals are uncertain about 'problem management, prompt and timely service' of this channel. They don't know where or whom they will call if something goes wrong. Also they fear if the service is halted then how they will do their transaction timely. A similar perception obstructs potential customers from availing this channel, which is 'poor call center support'. Approximately 39% people are anxious that they will not get proper support in case of any emergency from call center. As many people in our country are not technologically literate, they (around 36%) think if they lost their Internet Banking device through which they conduct Internet Banking (or if it is unattended), then their money will be lost. Also near about 34% individuals fear that they will not get proper and timely service from dispute management cell. Similarly, around 41% people are hesitant to use this channel because they don't know where and how to communicate in case of any problem. Lastly, near about 29% potential customers are being disinterested in using this channel when they hear any negative news (fraud, hacking, complexity of the system, lengthy process to settle dispute etc.) about this channel from their relatives or friends or neighbors. Banks take various footsteps to create a strong trusted relationship with their customers. The summary of these initiatives are shown in Table-17.

Table 17: Initiatives Taken by Banks for Trust Building of Customers

Steps Taken By Banks	% of Banks
Alert/security awareness related messages through SMS, Email/ EDM, Website, Social Media (FB Page, LinkedIn, WhatsApp)	76.9
Banners display security awareness related messages in branches	15.4
Virtual Keyboard	32.6
Image Setup/ CAPTCHA	28.7
Multi Factor Authentication (OTP, PIN, Biometrics)	87.1
24 hours Call Center Support	69.3

Source: BIBM Survey

Call center plays an important role in case of any emergency required by Internet Banking customers. When instant support is necessary mainly for security and fraudulent activities, customers highly rely on call center support. Importance of call center is mainly felt especially in holidays or when the bank is closed at night. Types of Internet Banking services provided by percentage of banks from call center to increase trust of users are summarized in the following table.

Table 18: Types of Internet Banking Services Provided from Call Center to Increase Trust of Users

Types of Internet Banking Services	% of Banks
User Activation, deactivation, lock, unlock	69.1
Password/PIN activation/reset	59.3
OTP Unlock	48.7
Device ID Binding	35.6
Tag Request	35.2
Software/Hardware Token related troubleshooting	38.8
Suspension of online transaction	41.6
Transaction related different problems	75.7
Monitor customer's claim regarding any fraudulent activity and dispute management	82.5

Source: BIBM Survey

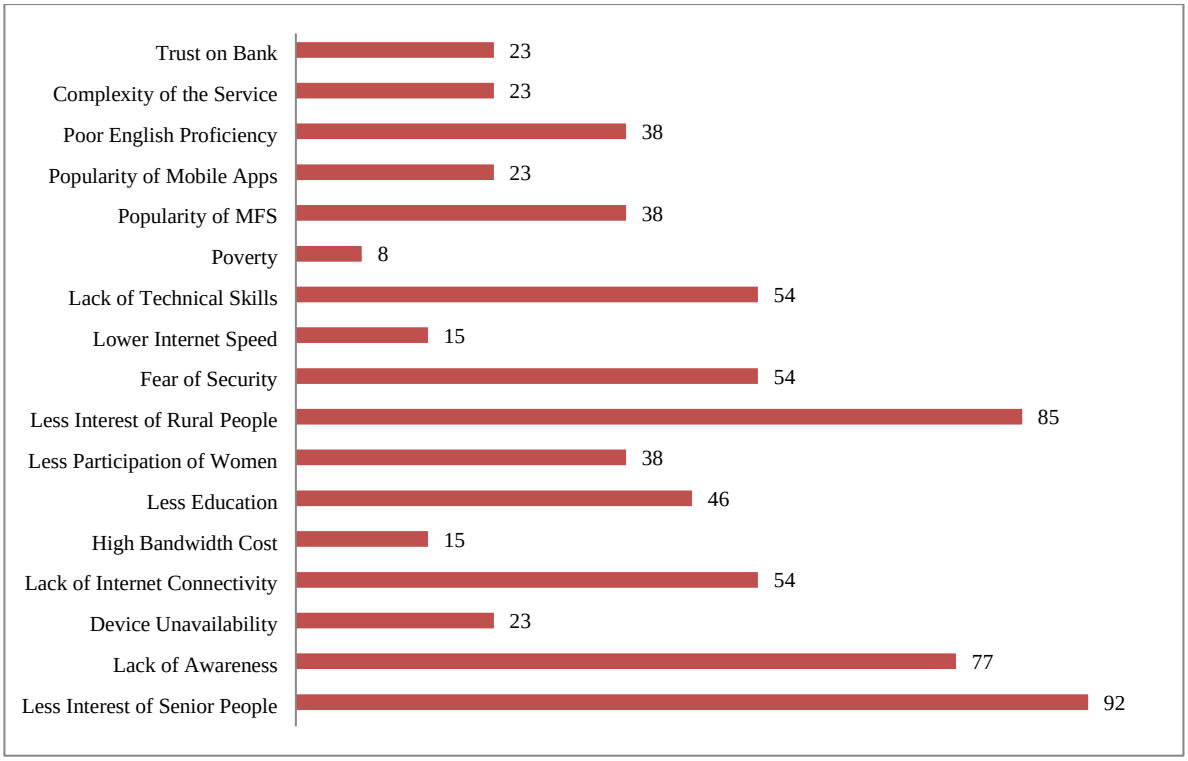
2.7 User Acceptance of Internet Banking

Total number of customers using Internet Banking stood at 2,72,151 at the end of 2019. Customers of different banks can be segregated into some common criteria such as age groups, gender and living area. It is found that 67 per-cent customers of Internet Banking are aging less than or equal to 35, and remaining customers are more than 35 years old. The data clearly indicates that young generation prefers Internet Banking. Among the Internet Banking users, a whooping portion are male (86 %) which shows that male are participating more for getting Internet Banking services compared to female users. Banks can offer special Internet Banking products and services for attracting female customers. The ratio of the customers living in urban and rural areas is also remarkable (83:17). It is evident that banks focus less on female and rural customers. More awareness program can be taken targeting this group. To serve the rural customers efficiently, rural IT infrastructure must be developed. Government can take necessary steps in this regard. Internet Banking services should be made available to the low-income female customers. Govt. may give subsidies to the women users to purchase smartphones and special Internet package may be designed by the Internet Service Providers targeting this deprived group.

2.7.1 Major Factors Identified by Banks

This section depicts some vital information about the major factors that are identified by banks and hinder the users to accept Internet Banking in Bangladesh. Each factor may be critically analyzed by banks to boost up the Internet Banking market in our country. As seen from Figure-30, 92% banks opined that elderly people are less interested in doing Internet Banking transactions due to fear and technological knowledge gap. Another noteworthy issue is the less participation of rural people in Internet Banking.

Figure 30: Major Factors Identified by Banks that Hinder the Users to Accept Internet Banking (In %)



Source: BIBM Survey

85% banks observed this as an impeding factor. 77% banks found that there is a lack of customers' awareness regarding Internet Banking which creates a major barrier in accepting Internet Banking in this country. About 54% banks notified that there are fear of security, lack of technical know-how and lack of Internet connectivity among the customers which are other key obstacles. 46% banks noticed that customers are not educated enough which can help them to perform this highly technical service efficiently. 38% banks observed less involvement of women as another obstructing factor. About 23% banks think less trust on bank is an important factor. Whereas, around 23% banks emphasized on some impeding factors such as complexity of the service, popularity of mobile app and also the unavailability of devices that can run Internet Banking. Only 15% banks reported that high bandwidth cost and low Internet speed also obstruct the smooth operation of this service. Near about 8% banks replied that poverty might be another factor and no bank agreed on the higher service charge.

2.7.2 Factors Identified by Using Customers Opinion

In this study, we used the following logistic regression where the dependent variable is a *logit*, which is the natural log of the odds, that is:

$$logit\ (x) = ln\ (\frac{p(x)}{1-p(x)}) = \beta 0 + \beta 1\ Age + \beta 2\ Gender + \beta 3\ Area\ of\ Living + \beta 4\ Education + \beta 5\ Income + \beta 6\ Awareness + \beta 7\ Ease\ of\ Use + \beta 8\ Security + \beta 9\ Technical\ Knowledge + \beta_{10}\ Internet\ Quality + \varepsilon$$

Here, *p(x) = Probability of Accepting Internet Banking, 1-p(x) = Probability of Not Accepting Internet Banking. p(x)* can be found by using the following equation.

$$p(x) = \frac{e^{logit\ (X)}}{1 + e^{logit\ (X)}}$$

Logistic regression analysis examines the influence of various factors on a dichotomous outcome by estimating the probability of the event's occurrence. It is mentionable here that all of the assumptions are met while analyzing survey data with logistic regression. An attempt was made to remove multi-collinearity among independent variables. We have chosen the independent variables meticulously and we have also removed closely related independent variable before analyzing data through logistic regression. The variables whose association is below 0.50 are chosen in logistic regression analysis.

A total of 282 respondents participated in the survey. Among them 59.56% have been found using Internet Banking service and the rest 40.44% are non-user.

Table 19: Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	94.261	0.586	0.787

Source: Analysis from Research Data

The Model Summery provides the -2LL and pseudo-R^2 values for the full model. The R^2 values tell us approximately how much variation in the outcome is explained by the model. Here, explained variation in the dependent variable based on the model ranges from 58.6% to 78.7% depending on the Cox & Snell R Square and Nagelkerke R Square. We prefer to use the Nagelkerke's R^2 which suggests that the model explains 78.7% of the variation in the outcome.

Table 20: Classification Table*

	Observed		Predicted		
			Do you use Internet Banking?		Percentage Correct
			0 (No)	1 (Yes)	
Step 1	Do you use Internet Banking?	0 (No)	103	11	90.3
		1 (Yes)	16	152	90.4
	Overall Percentage				90.3
*The cut value is .500					

Source: Analysis from Research Data

The classification table shows how accurately the model predicts the data and shows the accuracy. Here the model predicted numbers of users of Internet Banking service were 101 but the actual numbers of Internet Banking users were 122. So here the deviation is 11 and the accuracy rate is 90.3%. On the other hand, this model predicted numbers of non-users were 75 but it was actually 83. So here deviation is only 8 and here the level of accuracy is 90.4% which is very efficient. Finally, the overall accuracy rate is 90.3%.

We have taken ten variables to identify the most significant factor which affects the acceptance of Internet Banking among customers in our country. We have found seven variables that are statistically significant as their level of significance are less than or equal to 0.05 (Table-21).

Table 21: Variables in the Equation

Variables	B	S.E.	Wald	df	Sig.	Exp (B)
Age	1.484	0.726	4.173	1	**0.041**	4.411
Gender	2.666	0.573	21.677	1	**0.000**	14.388
Area of Living	2.532	1.321	3.672	1	**0.055**	12.574
Education	0.209	0.455	0.211	1	0.066	1.233
Income	2.166	2.136	1.023	1	0.310	8.674
Awareness of Internet Banking	2.824	0.748	14.248	1	**0.000**	16.851
Ease of Use	2.319	0.834	7.741	1	**0.005**	10.170
Security	0.767	0.705	1.186	1	**0.026**	2.154
Technical Knowledge	1.236	0.517	5.719	1	**0.017**	3.442
Internet Quality	0.035	0.868	0.002	1	0.681	1.036
Constant	-5.216	1.538	11.498	1	**0.001**	0.005

Source: Analysis from Research Data

Age: We used 'Age' as a dummy variable. '0' is given to the group more than 35 years of age and '1' for the group less than 35. Here this factor is found highly statistically significant as level of significance is 0.041 and the Exp (B) is 4.411. That means if customers age is less than 35 years then the chance of accepting Internet Banking of this group is about four times more than those customers whose age are more than 35. This is because younger people always want to explore something new/innovative and are more tech-savvy than elderly people.

Gender: We categorize 'Gender' into two groups. '0' means female and '1' means male. This factor is found to be very highly significant as level of significance is 0.000, which means that male are more likely to adopt Internet Banking than female. The probability of adoption of this channel among male is about fourteen times (14.388) higher than female. Many reasons work behind this factor. Generally in our society female are shyer than male. Also many of them are not financially independent. Low literacy rate of women may also a vital issue.

Area of living: It is used as a dummy variable. '0' is given to the group who live in rural area and '1' for those who live in urban area. Here this factor is found statistically significant as level of significance is 0.055. It means that a person living in rural area is about 12 times (12.574) less likely to adopt this channel than a person living in urban area. It is obvious that in rural areas the availability of device and speed of Internet is a great concern. Also low literacy rate of rural people is a barrier to adopt this type of technical medium.

Awareness of Internet Banking: We categorize 'Awareness of Internet Banking' into two groups. '0' is given to the group who are not aware and '1' for the group who are aware. Here this factor is also found statistically very highly significant as level of significance is 0.000 and the Exp (B) is 16.851. That means if customers are conscious about this ADC then there is about 16 times more chance that they accept Internet Banking than the unaware group. This is because people, who are familiar with Internet Banking, also know the facilities and advantages of this channel, which inspire them to adopt and use this medium.

Ease of Use: We used this factor as a dummy variable. '0' is given to the group who do not think this channel is easy to use and '1' for the group who think so. Here this factor is found statistically highly significant as level of significance is 0.005. That means customers who find this medium is easy to use is more likely to accept this channel than those who find it difficult. And the likelihood of adoption of this channel among this skilled group is more than ten times (10.170) higher than the novice group. This is because young and educated people know how to use this technology well. Also they know English better than uneducated group, so language does not pose a barrier for them.

Security: The variable 'Security' is categorized into two groups. '0' is assigned to people who do not think Internet Banking is a secured medium; otherwise '1' is given to the variable. Here this factor is found statistically highly significant as level of significance is 0.026. That means customers who find this medium is secured is more likely to use this channel than those who find it unsafe. And the probability of embracing this channel among the second group is two times (2.154) higher than the first group. Security has many aspects. If a person finds the medium as trustworthy and safe then he will use the channel happily. Again, if he finds his privacy is ensured and if any fraud happens he will get back his money fast then he will accept the technology.

Technical Knowledge: We used this factor as a dummy variable. '0' is given to the group who are technically sound and '1' for the group who are not. Here this factor is found statistically significant as level of significance is 0.017. That means customers who are tech-savvy is more likely to use this channel than those who are not. The possibility of adoption of this channel among this skilled group is three times (3.442) higher than the neophyte group. This is because the technically sound group know well about computer, smart phone, Internet, website, PIN, OTP, ID, password, biometric etc. This understanding stimulates them to use this channel.

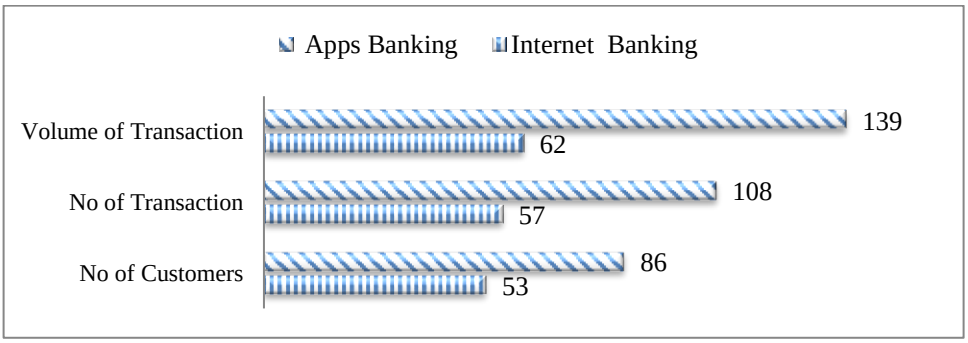
Three variables 'Education', 'Income' and 'Internet Quality' are not found to be statistically significant at 5% level of significance. The levels of significance of these variables are 0.066, 0.310 and 0.681, respectively. Here, the variable 'Education' is significant at 10% level. We have found that the probability of adoption of Internet Banking is 1.233 times higher for educated (higher secondary or above) people than less educated (up to higher secondary) people. This is because educated group are curious by nature and they can smartly handle the technological aspects of Internet Banking. It is seen from the table that 'Internet Quality' does not pose any tough obstacle in adopting this channel. Lastly, the level of significance of the variable 'Income' is 0.310 and the Exp(B) is 8.674. Though the finding is not significant statistically, there is a tendency of adopting Internet Banking by high earnings (middle class and above) group which is around 8 times higher than low earnings (lower than middle class) group. This is because generally high-income group is educated, live in urban area and habituated in using technology.

2.8 Impact of COVID-19 on Internet and App Banking

COVID-19 pandemic creates a serious havoc on the economy of our country. Banking sector also faced a bitter catastrophe by the devastating impact of COVID-19. However, a complete different scenario is observed in case of Internet Banking. It has got some positive vibes in terms of volume of transaction, number of transaction and number of customers. As

customers are trying to maintain social distancing and avoiding human interactions, 55% banks see a sudden growth of Internet Banking due to the impact of COVID-19. From Figure-31, it is seen that volume of transaction and number of transactions have been increased by 62% and 57%, respectively. Most importantly, 53 per-cent new customers have been added in this pandemic situation to avail Internet Banking services.

Figure 31: Growth of App and Internet Banking (Retail) Due to COVID (In %)



Source: BIBM Survey

App banking can also be thought as an alternative of Internet Banking. Table-22 compares the growth of Internet and App Banking due to the impact of COVID-19 pandemic. The table compares growth with respect to number of customers, number of transactions and volume of transactions. In case of Internet Banking, growth in average, minimum and maximum numbers of customers are 53%, 1% and 271%, respectively whereas it is 86%, 45% and 157%, respectively for banking apps. From the table, it is also found that, in all aspects, growth of App banking is higher than Internet Banking during to COVID-19 pandemic. Popularity of smart phone and Internet penetration could have an influence in this regard. More emphasis may be given to hold this growth in future.

Table 22: Growth (In Percent) Due to the Impact of COVID-19 Pandemic

		No of Customers	No of Transaction	Volume of Transaction
Internet Banking	**Average**	53	57	62
	Min	1	12	11
	Max	271	124	168
App Banking	**Average**	86	108	139
	Min	45	31	52
	Max	157	253	341

Source: BIBM Survey

Distribution of total customers, number of transaction and volume of transaction with respect to corporate and retail Internet Banking before and after COVID-19 pandemic is shown in

the following table. An interesting point found from the table is that, before COVID-19 corporate clients were not so much interested in Internet Banking. Less than 2% of total transactions were done by them, which consists of 41.1% of total volume of transaction. That means, before the pandemic retail customers held the majority portion in both fields. But during COVID-19 situation, business farms considered Internet Banking as a suitable medium for conducting business. More than 11% of total transaction and 75% of total volume of transaction were captured by business bodies during COVID.

Table 23: Impact of COVID-19 on Corporate and Retail Market Share of Internet Banking

		Total Customers	Number of Transaction	Volume of Transaction
Before COVID	**Corporate**	0.9%	1.9%	41.1%
	Retail	99.1%	98.1%	58.9%
During COVID	**Corporate**	0.8%	11.7%	75.4%
	Retail	99.2%	88.3%	24.6%

Source: BIBM Survey

2.9 Challenges of Internet Banking and Role of Bangladesh Bank

2.9.1 Challenges of Internet Banking Operations in Banks

IT department of banks has been facing different challenges or obstacles to manage Internet Banking services efficiently. The opinions of HOITs of sampled banks are summarized in Table-24.

Table 24: Problems/Challenges of Internet Banking Operations and Probable Remedies

Problems/Challenges	Remedies
Acquisition and activation rate of Internet Banking customer is low	Opening of more useful service that can attract more customers. Need mass level awareness among prospective customers.
National level infrastructure (Internet, electricity) is not adequate to provide flawless Internet Banking service to rural people	Government and Telecom companies may take initiatives to develop Internet infrastructure all over the country, mainly in rural areas.
Incorporating new product/features is time consuming	With sufficient professionals, skilled and expert in-house development team is needed to provide flawless service.
Lack of proper regulatory support. Sometimes it is very difficult to comply with regulatory requirement to incorporate new features with existing system.	Good supervision and support from Central Bank is needed to overcome this problem. The Central Bank may increase the time, if necessary, to comply with the demand.
Lack of security awareness of clients. Sometimes they share their credentials with fraudsters which lead to fraud issue.	Banks should send regular e-mail, SMS regarding security, fraudulent issues to aware customers. Print, electronic and social media may be used in this purpose.

Problems/Challenges	Remedies
Ensuring round the clock service is very difficult if proper disaster recovery planning is not formulated	Banks may maintain a dedicated team for smooth operation of Internet Banking including proper disaster recovery planning. The Central Bank may monitor this issue.
Inadequate marketing budget	Invest more in brand building and customer communication and awareness. Marketing team should focus on how to convince traditional banking users to start using Internet Banking services.
The ability to adopt global technology to local system	Locally produced good customizable software is required.
Very difficult to ensure high level security	With a high-quality dedicated team, SOC may be implemented to handle security issues. More budgets are required to implement latest technology, hardware and software. Banks should continuously update firewall technology which blocks illegal access from individuals.

Source: BIBM Survey

2.9.2 Role of Bangladesh Bank

As a regulatory body, BB has been playing notable role to maintain smooth and secured e-banking operations. Besides, due to rapid growing of state-of-the-art e-banking products and services, banking community expects more contributions from BB. Opinions and expectations of banks regarding the role of BB for smooth Internet Banking operations are summarized and presented in Table-25.

Table 25: Role of Central Bank to Remove Internet Banking Problems

Role of Central Bank	% of Banks
Bangladesh Bank may mandate to establish SOC for all banks with proper guidelines to prevent potential Internet Banking security threats.	69
Clients demand to increase the limit of daily fund transfer. Bangladesh Bank can increase the present transaction limit which is now BDT 5 lac per day.	65
BB may give incentive for top most Internet Banking service provider.	43
BB kicked off Interoperable Digital Transection Platform (IDTP) for pilot launch which will play a great role in Internet Banking. BB may start its operation as early as possible.	51
BB may mandate to start Internet/App Banking for those banks that are not providing the service.	52
Special care of BB is needed to reduce the NPSB dispute management time.	60
BB may take initiatives for CIB automation for digital lending.	55
Central Bank may issue separate guideline for better management of Internet Banking.	64
BB may periodically arrange meeting with stakeholders for knowing actual problem to take initiative regarding Internet Banking.	54

Source: BIBM Survey

3.0 Recommendations

One, Market Penetration: In 2001 only one bank was providing transactional Internet Banking services and the number stood at 35 in 2019. In 2019, portion of Internet Banking accounts was only 0.99% of total number of accounts (249.18 Millions), though there was a huge scope to bring those accounts under Internet Banking services. Among all ADCs, Internet Banking possessed only 6.53% of the total volume of transactions and 0.48% of the total number of transactions. Still a big portion of customers are not aware of Internet Banking. Though banks are sending SMS and e-mail to current and prospective customers; publishing Internet Banking related information through banks' website; displaying banners in branches; advertising in radio, TV, print and social media (Facebook, YouTube, WhatsApp, Twitter, etc.); and disseminating information through live chat/chat-bot/help-desk, it seems that these ways to attract customers are not adequate and failed to attract the target group. Still, among the customers 67% are young (age < 35), 86% are male and 83% are living in urban areas. It is evident that banks focus less on female and rural customers. More awareness program can be taken targeting these groups. It is also found that market share of all types of ADCs is mostly dominated by Private Commercial Banks. In case of offering Internet Banking service, PCBs are taking the leading position compared to FCBs. PCB holds more than 92% and 78% of total customers and number of transactions, respectively. But in case of volume of transactions FCB holds nearly 69% of total amount of transactions. SOCBs and SDBs are not offering Internet Banking services, though they have a huge customer base. If these two categories of banks start giving Internet Banking services then the boon of this service can be enjoyed by mass people, which in turn can increase financial inclusion. Lack of long-term vision, proper planning and initiatives, shortage of manpower, poor IT budget, weakness of business process reengineering, delay in procurement process, lack of appropriate and advanced training, building IT leadership quality and efficiency of IT team are the major barriers for them to implement Internet Banking. Government may take initiatives to increase the market share of government banks for giving latest technological services to its large customer base. Among the banks that are not providing any Internet Banking services, a major portion (50%) of banks has not taken any initiatives so far to start transactional Internet Banking. Banks that are not providing any Internet Banking services don't have any banking app also. Among them even 75% banks haven't taken any initiatives yet to develop app to deliver basic Internet Banking services using smart phone.

Two, Trust: Trust is a factor that influences a nonuser of a channel to start using that channel and a user who periodically uses that channel inspiring to use that channel frequently. The study identified the main reasons that affect customers to trust on Internet Banking are: no clear idea about the channel and don't know where and how to communicate; fear of

technology, virtual banking and complex operation; panic of security, hacking and fraud; absence of 'Touch Feel' factor and fear of unattended and lost device. As many of the customers are not so much familiar with English language they want to avoid this channel willingly. Again, customers are uncertain about 'problem management, and getting prompt and timely service' of this channel. They don't know where or whom they will call, if something goes wrong. People are anxious that they will not get proper support from call center in case of any emergency. Moreover, potential customers are being disinterested in using this channel when they hear any negative news (fraud, hacking, lengthy process to settle dispute, etc.) about this channel from their relatives or friends or neighbors. Banks have taken various footsteps like awareness building, security tightening and instant communication with customers to create a strong trusted relationship with their customers. Moreover, for providing instant support, mainly for security and fraudulent activities, banks also established call center and providing 24 hour support. But market penetration and growth rate of this channel indicates that the steps taken to increase customers' faith are not adequate and banks failed to establish expected trusted relationship with prospective customers. More emphasis should be given to improve customers trust.

Three, User Acceptance: The study tried to identify the major factors that hinder the users to accept Internet Banking in Bangladesh from bank (supply side) and customers' (demand side) perspective. We analyzed customers' data as well collected information from banks to identify the major factors that obstruct the user acceptance. The factor that are identified by both banks and customers are: less interest of senior citizen (age), less participation of women (gender), less interest of rural people (area of living), lack of awareness, fear of security, lack of technical skills, complexity of the service (ease of use), poor English proficiency (less education); device unavailability, lack of Internet connectivity and poverty (low income); high bandwidth cost and low Internet speed (Internet quality). Each factor may be critically analyzed by banks to boost up the Internet Banking market in our country.

Four, Security, Fraud and Disputed Transactions: Security is one of the key concerns in Internet Banking, which hinders the expected growth of this channel in our country and 54% users are concerned about security features of Internet Banking. Each year a large number of fraudulent activities are done by unauthorized users that cause financial and reputational loss of a bank. Fraud happens mainly due to device, password and credentials sharing by unaware customers. Sometimes, crackers break the system by phishing, hacking, spoofing, SIM cloning and session hijacking and subsequently get necessary information to do fraudulent transactions through Internet Banking. Customers' awareness can be increased by sending SMS, e-mail, counseling, advertising and distributing leaflets/brochures. Specialized training on Internet Banking security and fraud prevention can be provided to IT employees of banks who are providing the Internet Banking services. Dispute settlement is another critical issue

in this highly technical medium. This process is lengthy and intricate in some banks. Sometimes it takes one month or more to resolve the dispute. About 39% banks do not have a dispute management cell for resolving conflict arises from Internet Banking. In 2019, the average and maximum number of Internet Banking related disputed transactions were 2054.8, and 11,370, respectively which is alarming. Proper steps should be taken to minimize the total number of disputed transactions and resolve the disputes quickly to increase customers' trust on this channel.

Five, Reduction of Transaction Cost: Profitability of banks is under tremendous pressure because of continuous shrinking of spread. It becomes important for banks to reduce the cost per transaction for increasing spread that in turns will increase the profitability of banks. A strong ICT infrastructure have been developed by the banks of Bangladesh by investing Tk. 40,943 crore, mainly in last two decades. Consequently, cost of transactions, distance of financial access points, cost to access a financial service point, travel time to get a financial access point also reduced dramatically. To get the maximum benefits of this investment and technological achievement a tactical roadmap may be developed by the government with the help of Bangladesh Bank in collaboration with other regulators of financial sector to develop a cashless society and digital financial sector to achieve the broader national goal, a 'Digital Bangladesh'. As the transaction cost of Internet Banking is the lowest among all ADCs, boosting up the use of this channel by mass people of the country may help to achieve the dream.

Six, Customers' Satisfaction: Satisfaction of customers directly helps to increase any business. In this study, highest satisfaction is seen in case of accuracy of operations (3.98 out of 5) which implies that current Internet Banking infrastructure helps bankers to reduce operational errors and lowest satisfaction is found in case of handling grievances (2.62 out of 5). That is customers are not getting right and quick solution when they complain for any dispute. Moreover, overall customers' satisfaction 61% implies that there are enough scopes to develop good customer relationship by satisfying them more. However, with this level of overall satisfaction the customers would like to continue their relationship with the bank for the time being but they would disagree to recommend other customers to make a relationship with the respective bank. This study also identified major factors that affect customers' satisfaction on Internet Banking services. 'Digitization of Internet Banking', 'Operational Efficiency', 'Post Purchase Behavior of Banks' and 'After Sales Support' are the most important identified factors. Banks may give emphasize on these factors to make their customers more happy. The survey exhibits, only 31% banks conducted survey among customers to get feedback about their Internet Banking services and customers' satisfaction. So, this is a very disgruntled scenario and banks must focus on conducting surveys about Internet Banking service quality.

Seven, Impact of COVID-19 on Internet Banking: COVID-19 pandemic creates a serious havoc on the economy of our country. Banking sector also faced a bitter catastrophe by the devastating impact of COVID-19. However, a complete different scenario is observed in case of Internet Banking. As customers are trying to maintain social distancing and avoiding human interactions, 55% banks see a sudden growth of Internet Banking due to the impact of COVID-19. Both volume and number of transactions have been increased by 62% and 57%, respectively. Most importantly, 53 per-cent new customers have been added in this pandemic situation to get Internet Banking services. App banking can also be thought as an alternative of Internet Banking. It is also found that, in all aspects, growth of App banking is higher than Internet Banking during COVID-19 pandemic. More emphasis may be given to hold this growth in future. An interesting point found from the study is that, before COVID-19 corporate clients were not so much interested in Internet Banking. Less than 2% of total transactions were done by them, which consists of 41.1% of total volume of transaction. But during COVID-19 situation, business farms considered Internet Banking as a suitable medium for conducting business. More than 11% of total transaction and 75% of total volume of transaction were captured by business bodies. All banks, irrespective of advancement or less advancement in digital banking, need to put greater emphasis on Internet Banking. Banks also need to enhance the capacity to design and launch new products along with offerings to handle the COVID situation.

Eight, Special Recommendations by HoITs: Important and adequate Internet Banking services are not provided by all banks. Banks can provide more useful services that can attract more customers. Mass level awareness can be built up among prospective customers to penetrate the market. Internet infrastructure of our country is not satisfactory. Government and Telecom companies may take initiatives to develop Internet infrastructure all over the country, mainly in rural areas. For many banks, incorporating new product/features is time consuming due to lack of sufficient professionals. Skilled and expert in-house development team is needed to provide flawless service. Sometimes it is very difficult to comply with regulatory requirement to incorporate new features with existing system. In this situation, the Central Bank may increase the time, if necessary, to comply with the demand. Lack of security awareness of clients sometimes leads fraudulent transactions. Banks should send regular e-mail, SMS regarding security, fraudulent issues to aware customers. Print, electronic and social media may be used in this purpose. Adequate budget should be there. Research and marketing team should focus on how to convince traditional banking users to start using Internet Banking services. With a high quality dedicated team, SOC may be implemented to handle security issues. More budgets are required to implement latest technology, hardware and software. Banks should continuously update firewall technology which blocks illegal access from individuals.

Nine, Role of Bangladesh Bank: BB has been working proactively for a long period to develop the overall IT infrastructure of banking sector. Proper guidelines and monitoring of BB has also been helping the IT departments of different banks to expand in right way. As a result, expectation from BB is increasing day by day. This study demands some additional supports to strengthen the Internet Banking in Bangladesh. To encourage banks for providing virtual banking, BB may give incentive for top most Internet Banking service provider. BB may request to start Internet/App Banking for those banks that are not providing the services. According to clients demand, to increase the daily fund transfer limit, Bangladesh Bank may increase the present Internet Banking transaction limit. BB may start Interoperable Digital Transection Platform (IDTP) as early as possible, which will play a vital role in transferring funds among banks. Additionally, quick support from BB is required to manage disputes related to NPSB. Banks are demanding online CIB of BB for digital lending. Bangladesh Bank may mandate to establish SOC for all banks with proper guidelines to prevent potential Internet Banking security threats. Central Bank may issue separate guideline for better management of Internet Banking. Periodical meetings may be arranged with stakeholders for knowing actual problem to take initiative regarding Internet Banking.

References

Allied Market Research (2020), Online Banking Market Service: Global Opportunity Analysis and Industry Forecast, 2020–2027.

Bruene B, Dennis C. (2010). Internet banking acceptance model: Cross-market examination. *Journal of Business Researc,*. 63 (2010) 957–963

Boulding F, Bagozzi R, Warshaw P. (1993) User acceptance of computer technology: a comparison of two theoretical models. Manage Sci 1989;35:982-1003.

Davis F. Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly 1989;13:319–40.

Fournier F, Mick R. (1999) User acceptance of information technology: system characteristics, user perceptions and behavioral impacts. Int J Man-Mach Stud 1993;38:475–87.

Davis L, Wang S, Lindridge A. (2008) Culture influences on emotional responses to on-line storeatmospheric cues. J Bus Res 2008;61:806–12

Fortin DR, Dholakia RR, Dholakia N. (2002) Introduction to special issue, emerging issues in electronic marketing: thinking outside the square. J Bus Res 2002;55(8):623–7.

Friedman B, Kahn P, Howe D. (2000) Trust online. Commun ACM 2000;43:34–40

Graven, M. P. (2000). Electronic Money, PC Magazine. August.

Grewal D, Iyer G, Levy M. (2004) Internet retailing: enablers, limiters and market consequences. J Bus Res 2004;57(7):703-7013.

Hernando, I. and Nieto, M.J. (2007), "Is the internet delivery channel changing banks' performance? The case of Spanish banks", Journal of Banking and Finance, Vol. 31 No. 4, pp. 1083-99.

Koskosas, I., & Koskosa, M.M. (2011). Internet banking security management through trust management. *World of Computer Science and Information Technology Journal, 1*(3), 79-87.

Kramer RM. (1999) Trust and distrust in organizations: emerging perspectives, enduring questions. Annu Rev Psychol 1999;50:569–98.

Liao J. and Lin T. (2008). Effect of consumer characteristics on their acceptance of online shopping: Comparisons among different product types. Computer in Human Behavior, Volume 24, Number 1, pp. 48-65.

Liu C, Jack M, June L, Chun Y. (2004) Beyond concern: a privacy-trust-behavioral intention model of electronic commerce. Inf Manag 2004;42:127–42.

McKnight D, Chervany N. What trust means in e-commerce consumer relationships: an interdisciplinary conceptual typology. Int J Electron Commer 2002;6:35–59.

Morgan R, Hunt S. The commitment–trust theory of relationship marketing. J Mark 1994;58:20–38.

Pikkarainen, T., Pikkarainen, K., Karjaluoto, H., & Pahnila, S. (2004). Consumer acceptance of online banking: an extension of the technology acceptance model. Internet Research, 14, 224-23 5

Pi, S-M., Liao, H. L., & Chen, H. M. (2012). Factors that affect consumers' trust and continuous adoption of online financial services. *International Journal of Business and Management*, *7*(9), 108-119.

Rotchanakitumnuai, S., & Speece, M. (2003). Barriers to Internet banking adoption: a qualitative study among corporate customers in Thailand. *International Journal of Bank Marketing*, *21*(6/7), 312-323.

http://dx.doi.org/10.1108/02652320310498465

Rousseau, D. M., Sitkin, S. B., Burt, R. S., & Camerer, C. (1998). Not so different after all: a cross-discipline view of trust. *Academy of Management Review*, *23*(3), 393-404. http://dx.doi.org/10.5465/AMR.1998.926617

Sathye, M. (1999). Adoption of Internet banking by Australian consumers: an empirical investigation. *International Journal of Bank Marketing*, *17*(7), 324-334. http://dx.doi.org/10.1108/02652329910305689

Treadwell, T. (2001). Community CU Increases Online Apps with Digital Insight's AXISe-Commerce Portal. CUES Tech Port. (www.cuestechoort.com).

Twum, F., Ahenkora, K. (2012). Internet Banking Security Strategy: Securing Customer Trust. *Journal of Management and Strategy*, V 3 (4).

Wang, Yi, Wang, Yu, Hsin-Hui, L., & Tzung-I, T. (2003). Determinants of user acceptance of Internet banking: an empirical study. *International Journal of Service Industry Management*, *14*(5), 501-519.

http://dx.doi.org/10.1108/09564230310500192.

Appendices

Appendix Table 1: List of the Banks Responded to the Questionnaire

State Owned Commercial Banks (SOCBs)
1. Sonali Bank Limited 2. Janata Bank Limited 3. Rupali Bank Limited 4. Agrani Bank Limited
Private Commercial Banks (PCBs)
1. The City Bank Ltd. 2. Islami Bank Bangladesh Ltd. 3. Brac Bank Ltd. 4. Eastern Bank Ltd. 5. Dutch-Bangla Bank Ltd. 6. United Commercial Bank Ltd. 7. AB Bank Ltd. 8. Bank Asia Ltd. 9. Mutual Trust Bank Ltd. 10. Prime Bank Ltd. 11. Trust Bank Ltd. 12. Social Islami Bank Ltd. 13. Exim Bank Ltd. 14. Southeast Bank Ltd. 15. NRB Bank Ltd. 16. One Bank Ltd. 17. NRB Commercial Bank Ltd. 18. National Credit and Commerce Bank Ltd. 19. Shahjalal Islami Bank Ltd. 20. First Security Islami Bank 21. Mercantile Bank Ltd.
Foreign Commercial Banks (FCBs)
1. Standard Chartered Bank 2. Habib Bank Ltd. 3. Commercial Bank of Ceylon

Appendix Table 2: List of Executives Interviewed

Sl. No.	Name	Bank Name
1.	Hasnain Ahmed	One Bank Limited
2.	Md. Saiful Islam	Bank Asia Limited
3.	Mohammad Emdadul Haque Khan	Dutch Bangla Bank Ltd.
4.	Engr. Shamsur Rahman Chowdhury	NCC Bank Ltd.
5.	Zahidul Haque	Eastern Bank Limited
6.	Abu Md. Sabbir Hassan Chowdhury	NRB Bank Limited
7.	B. M Zahid-Ul Haque	Brac Bank Ltd.
8.	Shyamol B. Das	Mutual Trust Bank Ltd.
9.	Khandaker Khaled Hassan	Southeast Bank Ltd
10.	Md. Mahbubul Alam	EXIM Bank Ltd.

Internet Banking in Bangladesh: Trust, User Acceptance and Market Penetration

Questionnaire for Head of IT

Name		Cell Phone No.	
Designation/Rank			
Name of the Bank			
Bank Type	☐ State-owned 1 ☐ Specialized 2 ☐ Private 3 ☐ Foreign 4		

(Please don't change any formatting or numbering of the questionnaire. For questions demanding opinion you may add spaces by entering new lines only.)

Section-A Internet Banking: Basic Information

1.	Do you provide Internet Banking services? ☐ Yes 1 ☐ No 0 If Yes, please mention the type of Internet Banking. ☐ Informational (Institutional Information, Financial Offers, Search Engine, Report Download, Recruitment Forms, Hot Links, Advertisement etc.) ☐ Communicational (E-mail, Suggestion and Complaints Form, Financial Calculator, Investment Advisor, Software Download, Videoconference, Chat Box, etc.) ☐ Transactional (Opening Account, Investment and Credit Application, Account Balance and Statement, Fund Transfer, Bill Payment, etc.) If you do not provide any transactional service please go to Section F and Section G.
2.	Please write your web address.

3.	Who developed the website?	☐ Developed by the Bank (In-House)$_1$ ☐ Developed by the Vendor (Outsourced)$_2$ ☐ Others$_3$…….
	If outsourced, select the type of vendor.	☐ Local $_1$ ☐ Foreign $_2$ ☐ Others$_3$…….
	Please mention your satisfaction level to adopt any change or new feature considering time, cost and vendor resources. ☐ Very Poor $_0$ ☐ Poor $_1$ ☐ Moderate $_2$ ☐ Good $_3$ ☐ Very Good $_4$ ☐ Excellent $_5$	
4.	What Business Model of Internet Banking services do you provide?	☐ Retail $_1$ ☐ Corporate $_2$ ☐ Both $_3$
5.	In which year did you start Internet Banking services?	Retail: Corporate:
6.	Do you have a separate Department or Wing to provide Internet Banking services?	☐ Yes $_1$ ☐ No $_0$
	If, Yes, how many people are engaged there?	

Section-B Internet Banking: Retail Customers

7.	Non-Transactional Banking Services		
	Please select 'Yes' if you provide the following General Banking Services through Internet Banking. Select 'No', otherwise.		
	a)	Self-Registration	☐ Yes $_1$ ☐ No $_0$
	b)	Login Password Management	☐ Yes $_1$ ☐ No $_0$
	c)	2FA Control/Management (PIN, OTP, SMS, etc.)	☐ Yes $_1$ ☐ No $_0$
	d)	Opening Savings Account	☐ Yes $_1$ ☐ No $_0$
	e)	Opening Current Account	☐ Yes $_1$ ☐ No $_0$
	f)	Opening Fixed Deposit /Term Deposit Account	☐ Yes $_1$ ☐ No $_0$
	g)	Opening Deposit Pension Scheme Account	☐ Yes $_1$ ☐ No $_0$
	h)	Opening Loan Account	☐ Yes $_1$ ☐ No $_0$
	i)	Request for New Cheque Book	☐ Yes $_1$ ☐ No $_0$
	j)	Cheque Book Stop	☐ Yes $_1$ ☐ No $_0$
	k)	Standing Order from Own Account	☐ Yes $_1$ ☐ No $_0$
	l)	Request for Pay Order	☐ Yes $_1$ ☐ No $_0$
	m)	Placing Positive Pay Instruction	☐ Yes $_1$ ☐ No $_0$
	n)	Stop Payment (Cheque or Others)	☐ Yes $_1$ ☐ No $_0$
	o)	Download Account Statement/ Transaction Details/History	☐ Yes $_1$ ☐ No $_0$
	p)	View Account Details with Balance	☐ Yes $_1$ ☐ No $_0$
	q)	Request Paper Certificate (Tax, Solvency, etc.)	☐ Yes $_1$ ☐ No $_0$

	r) Request E-Certificate (Tax, Solvency, etc.)	□ Yes 1 □ No 0
	s) View (Track) Issued Cheque Status	□ Yes 1 □ No 0
	t) Update Personal Information Like Mobile Number, Email Address, etc.	□ Yes 1 □ No 0
	u) Customized Service Request	□ Yes 1 □ No 0
	v) Opening Credit Card Account	□ Yes 1 □ No 0
	w) Request for Credit Card Account Statement	□ Yes 1 □ No 0
	x) Download Credit Card Account Statement/Transaction Details/History	□ Yes 1 □ No 0
	y) Request for Credit Card Cheque Book	□ Yes 1 □ No 0
	z) Credit Card Cheque Book Stop Request	□ Yes 1 □ No 0
	aa) Activate and Deactivate (Block) Card (Credit and Debit)	□ Yes 1 □ No 0
	bb) Credit Card Standing Order	□ Yes 1 □ No 0
	cc) Request for Credit Card Account Information Change	□ Yes 1 □ No 0
	dd) Request for Dispute Investigation	□ Yes 1 □ No 0
	ee) Replace Card Request (Credit and Debit Card)	□ Yes 1 □ No 0

8.	Fund Transfer Services	
	Intra-Bank Fund Transfer (Transfer within the Bank)	
	Please select 'Yes' if you provide the following Fund Transfer Services through Internet Banking. Select 'No', otherwise.	
	Own Account to Own Account (Same Bank)	□ Yes 1 □ No 0
	If Yes, Select all that apply. □ MFS Account □ Agent Bank Account □ Savings Account □ Deposit Pension Scheme □ Current Account □ Fixed Deposit Account □ Credit Card Account	
	Own Account to Others Account (Same Bank)	□ Yes 1 □ No 0
	If Yes, Select all that apply. □ MFS Account □ Agent Bank Account □ Savings Account □ Deposit Pension Scheme □ Current Account □ Fixed Deposit Account □ Credit Card Account	
	Own Credit Card account to Own Accounts (Same Bank)	□ Yes 1 □ No 0
	If Yes, Select all that apply. □ MFS Account □ Agent Bank Account □ Savings Account □ Current Account □ …….. □ …….. □ ……..	
	Own Credit Card to Others Accounts (Same Bank)	□ Yes 1 □ No 0
	If Yes, Select all that apply. □ MFS Account □ Agent Bank Account □ Savings Account □ Current Account □ …….. □ …….. □ ……..	

9.	Inter-Bank Fund Transfer (Transfer Outside Banks)			
	Which services of Bangladesh Bank do you use? □ RTGS □ BEFTN □ NPSB			
	Which type of accounts of Other Banks do you accept for fund transfer? □ Savings Account □ Current Account □ Agent Bank Account □ Credit Card Account □ Local Wallet □ MFS Account			
10.	Payment Services			
	Please tick (√) 'Yes' if you provide the following Payment Services through Internet Banking and provide the number of Institutes/Companies/Merchants getting the service. Select 'No', otherwise.	Yes	No	Number of Institutes/Companies/Merchants
	Utility Bill	□	□	
	Credit Card Bill	□	□	
	Tuition Fee of School	□	□	
	Tuition Fee of College	□	□	
	Tuition Fee of University	□	□	
	Internet Bill/ISP Bill/Bill Payment to TELCOs/i-Top Up	□	□	
	Club	□	□	
	Organization	□	□	
	Insurance Premium	□	□	
	E-Commerce/Online Purchase Merchant Payment	□	□	
	Visa Fee of different Embassy	□	□	
	Donation	□	□	
11.	Please mention the percentage of total Internet Banking transactions according to Question 8-10 of the following category in 2019.			
	Intra-Bank Fund Transfer	Inter-Bank Fund Transfer	Payment Services	

12.	Security
	What methods do you use for Log In Authentication of User (using browser from Computer/Tab/Smart Phone, etc.)? □ User ID □ Password □ Finger Print □ Retina Scan □ PIN □ Device ID (IMEI)
	What methods do you use for Authorization of Transaction? □ OTP through e-mail □ OTP from Hardware /RSA Token □ PIN □ OTP Through SMS □ Mobile Apps
	What methods do you use for Notification of Transaction? □ Through e-mail □ Through SMS □ In-Apps □ □

13. What type of security threats do you face related to Internet Banking?

□ Phishing	□ Password Hacking	□ Password Sharing	□ Spoofing (Using False Call Center No.)
□ SIM Cloning	□ Website Hacking	□ DoS/DDoS Attack	□ Session Hijacking
□ MITMA	□ DNS Poisoning	□	□

Customers, Transaction, Volume and Growth

14. Please mention the number of current Retail Internet Banking Customers with respect to following Parameters.

Age <=35	Age >35	Male	Female	Urban	Rural

15. Please provide the following Retail Internet Banking information for last 5 years.

Year	Total Customers	Number of Transactions	Volume of Transactions
2016			
2017			
2018			
2019			
Up to October, 2020			

16. Are you satisfied with the growth of Internet Banking? □ Yes 1 □ No 0

If yes, what factors influenced the satisfactory growth?

If no, please explain why the expected growth is not achieved.

17. Please mention the growth of the Retail Internet Banking (in %) with respect to the following parameters due to the impact of COVID-19 pandemic situation.

Number of Customers	Number of Transactions	Volume of Transactions

18. What are the major factors that hinder the users to Accept Internet Banking in Bangladesh?

□ Senior People are Less Interested	□ Lack of Awareness	□ Device Unavailability	□ Lack of Internet Connectivity	□ High Bandwidth Cost
□ Less Education	□ Less Participation of Women	□ Less Interest of Rural People	□ Fear of Security	□ Lower Internet Speed
□ Lack of Technical Skills	□ Poverty	□ Popularity of MFS	□ Popularity of Mobile Apps	□ Poor English Proficiency
□ Higher Service Charge	□ Complexity of the Service	□ Trust on Bank/Service	□	□

***Please describe in an additional page, if you provide any other Internet Banking services for retail customers that are not mentioned in Question 8-10.**

Section-C Internet Banking Services: Corporate Customers

19.	Please select 'Yes' if you provide the following Services for corporate customers through Internet Banking. Select 'No', otherwise.	
	a) Bulk Fund Transfer (Salary, Benefits, Dividend, etc.) within bank	☐ Yes 1 ☐ No 0
	b) Bulk Fund Transfer (Salary, Benefits, Dividend, etc.) to other banks using RTGS/BEFTN/NPSB	☐ Yes 1 ☐ No 0
	c) Account to Account Transfer Within Bank	☐ Yes 1 ☐ No 0
	d) Account to Account Transfer Other Bank using RTGS/BEFTN/NPSB	☐ Yes 1 ☐ No 0
	e) Cheque Book Request	☐ Yes 1 ☐ No 0
	f) Request for Pay Order	☐ Yes 1 ☐ No 0
	g) Request for Demand Draft	☐ Yes 1 ☐ No 0
	h) Request for Printed Statement	☐ Yes 1 ☐ No 0
	i) Request for Printed Certificate (Solvency, Tax, etc.)	☐ Yes 1 ☐ No 0
	j) Duty Payment	☐ Yes 1 ☐ No 0
	k) Direct Debit Instruction	☐ Yes 1 ☐ No 0
	l) Cross Border Payment (Remittance, etc.)	☐ Yes 1 ☐ No 0
	m) Download Account Statement/ Transaction Details/History	☐ Yes 1 ☐ No 0
	n) Account Overview	☐ Yes 1 ☐ No 0
	o) Import Payment and Finance	☐ Yes 1 ☐ No 0
	p) Export Receipt and Finance	☐ Yes 1 ☐ No 0
	q) International Bank Guarantee	☐ Yes 1 ☐ No 0

20. Please provide the following Corporate Internet Banking retail information for last 5 years.

Year	Total Customers	Number of Transactions	Volume of Transactions
2016			
2017			
2018			
2019			
Up to October, 2020			

***Please describe in an additional page, if you provide any other Internet Banking services for corporate customers that are not mentioned in Question 19.**

Section-D Internet Banking: Challenges and Suggestions

21. What are the major benefits that customers and bank are getting? What are the major drawbacks of Internet Banking in the context of Bangladesh?

Benefits	Drawbacks

22.	Please mention some fraud cases (Maximum 5) regarding Internet Banking that are occurred in your bank with explanation (major reasons for fraud), if any.	
23.	For sending OTP through SMS or e-mail, is there any incident of fraud compromising the OTP (e.g. mobile SIM clone, etc.) in the last five years?	□ Yes 1 □ No 0
	If yes, please describe.	
24.	What steps do you take to create awareness among customers regarding dissemination of Internet Banking, Security Issues and Trust Building?	
25.	What types of marketing initiatives do you take to build a stronger market position and business development for Internet Banking?	
26.	Do you conduct any customer survey regarding Internet Banking to get feedback about your service quality and customer satisfaction?	□ Yes 1 □ No 0
27.	Do you have any Dispute Management Cell for Internet Banking?	□ Yes 1 □ No 0
	If yes, how many employees are dedicated for dispute management?	
	Please mention the total number of Internet Banking related disputed transactions in 2019.	
28.	What types of Internet Banking Services do you provide from Call Center?	

29.	Why will the prospective customers Trust on your Internet Banking services? What is your uniqueness?

30.	As a leader and Head of IT, you might have been facing different challenges or obstacles to provide Internet Banking services efficiently. Please state the reasons and probable solutions.	
	Problems/Challenges/Obstacles/Limitations	**Remedies**
31.	What role the central bank can play for better Internet Banking management in banks?	

Section-E Market Share of ADCs

32.	Please provide the following information of your bank (all branches and ADCs) at the end of 2019.			
	Total Number of Customers	Total Number of Accounts	Total Number of Transactions	Volume of Transactions

33.	Please provide the following information for the year 2019/at the end of 2019.					
	ADCs	Number of Terminals/Units	Number of Customers	Number of Agents	Number of Transactions	Volume of Transactions
	POST		×	×		
	ATM		×	×		
	MFS	×				
	Agent Banking	×				
	Credit Card Local		×	×		
	Credit Card Global		×	×		
	Mobile Apps	×		×		

34.	Please mention the Cost Per Transactions (Bank only, excluding the cost of agents) of the following ADCs in BDT at the end of 2019.

	POST	ATM	MFS	Agent Banking	Branch	Internet Banking	Apps Banking	

Section-F Yet to Launch Transactional Internet Banking?

35.	Please select the current stage of adoption of Transactional Internet Banking. ☐ No initiatives taken yet 1 ☐ Planning 2 ☐ Analyzing 3 ☐ Developing 4 ☐ Testing 5 ☐ Waiting to Launch 6
	If no initiatives is taken yet, what are the reasons behind and what is the future plan?

Section-G Banking through Apps

36.	Do you provide banking services through Apps? ☐ Yes 1 ☐ No 0			
	If No, please select the current adoption status of Apps Banking and skip from Question-37 to rest. If yes, go to question no. 37. ☐ No Initiatives taken yet 1 ☐ Planning 2 ☐ Analyzing 3 ☐ Developing 4 ☐ Testing 5 ☐ Implementing 6			
	If no initiatives are taken yet, what are the reasons behind and what is the future plan?			
37.	Please mention the name of the App.			
	When did you launch it?			
	Who developed the App? ☐ Developed by the Bank (In-House)1 ☐ Developed by the Vendor (Outsourced)2 ☐ Others 3…….			
	If outsourced, select the type of vendor. ☐ Local 1 ☐ Foreign 2 ☐ Others 3…….			
	Please mention your satisfaction level to adopt any change or new feature considering time, cost and vendor resources. ☐ Very Poor 0 ☐ Poor 1 ☐ Moderate 2 ☐ Good 3 ☐ Very Good 4 ☐ Excellent 5			
38.	Please provide the following information related to Apps Banking for last 5 years.			
	Year	Total Customers	Number of Transactions	Volume of Transactions
	2016			

	2017			
	2018			
	2019			
	Up to October, 2020			

39.	Are you satisfied with the growth of Apps based banking in last five years?	□ Yes 1	□ No 0
	If yes, what factors influenced the satisfactory growth?		
	If no, please explain why the expected growth is not achieved?		

40.	Please mention the growth of the Apps based banking (in %) according to the following parameters due to the impact of COVID-19 pandemic situation.		
	Number of Customers	Number of Transactions	Volume of Transactions

Additional Information:

Please send us a randomly selected List of 20 retail and 5 corporate customers covering the whole country who are using Internet Banking facilities of your bank. The list must contain name of the customer/institution, address and contact phone number. In case of retail banking, please add male and female customers, if possible. We will contact with the customers to get the satisfaction level of your product and services that will help to enhance the quality of the research.

Questionnaire for Internet Banking Users

Internet Banking in Bangladesh: Trust, User Acceptance and Market Penetration

Name of the Respondent					
Gender	□ Male			□ Female	
Age	□ 20 to 30	□ 30 to 40	□ 40 to 50	□ 50 to 60	□ 60 and above
Education	□ Primary	□ SSC	□ HSC	□ Graduation	□ Post-Graduation
Profession	□ Government	□ Private	□ Semi Government	□ Business	□ Student

Income	□ Below 20k	□ 20k to 40K	□ 40K to 60K	□ 60K to 80K	□ 80k to 1 lac	□ 1 lac above
Location	□ Urban	□ Rural	□ Semi-Urban			
Experience in internet Banking as user	□ Less than 1 Year		□ 1 Year to less than 2 years		□ 2 Years and more	

1	2	3	4	5
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

User Acceptance of Internet Banking

	Performance Expectancy/Perceived Usefulness					
	I can manage my money in Internet at anytime	1	2	3	4	5
	I can keep a record of my finances	1	2	3	4	5
	I need not visit traditional banks regularly	1	2	3	4	5
	I can transfer money anytime and anywhere	1	2	3	4	5
	I can save time paying essential bills	1	2	3	4	5
	Internet Banking is convenient and easy to access	1	2	3	4	5
	Internet Banking is efficient	1	2	3	4	5
	Internet Banking is effective	1	2	3	4	5
	Internet Banking improves productivity	1	2	3	4	5
	Internet Banking increases quality of output	1	2	3	4	5
	Internet Banking is useful	1	2	3	4	5
	Internet Banking fits into my lifestyle	1	2	3	4	5
	Effort Expectancy/ Perceived ease of use					
	Internet Banking is easy to learn	1	2	3	4	5
	It is easy to do what I want to do by using Internet Banking	1	2	3	4	5
	Internet Banking is easy to use	1	2	3	4	5
	It is easy to become skilful in using Internet Banking	1	2	3	4	5

	Using Internet Banking does not take too much time	1	2	3	4	5
	Authentication code is easy to use	1	2	3	4	5
	There is sufficient time for information entry	1	2	3	4	5
	Fast information download	1	2	3	4	5
	Easy web navigation	1	2	3	4	5
	Detailed answers referring to Frequently Asked Questions (FAQs)	1	2	3	4	5
	Comprehensive site map	1	2	3	4	5
	Useful search engine	1	2	3	4	5
	Social Influence					
	People who influence my behavior use Internet Banking	1	2	3	4	5
	Coworkers/classmates use Internet Banking	1	2	3	4	5
	Friends use Internet Banking	1	2	3	4	5
	People using Internet Banking have high profile	1	2	3	4	5
	People using Internet Banking have more prestige	1	2	3	4	5
	Most Bangladeshi like to use Internet Banking	1	2	3	4	5
	Facilitating Conditions					
	Basic system requirements for using Internet Banking are met	1	2	3	4	5
	All contents of Internet Banking are easy to read and understand	1	2	3	4	5
	Specific person (or group) is always available for assistance	1	2	3	4	5
	The language in which the document is written is easily understood	1	2	3	4	5
	Perceived Credibility/ Security and privacy					
	I trust in the ability of an Internet bank to protect my privacy and personal information	1	2	3	4	5
	I believe no money will be lost in unauthorized electronic fund transfers	1	2	3	4	5
	I believe Internet bank would not sell my personal information to third parties	1	2	3	4	5
	Other people cannot view my bank account information	1	2	3	4	5

	Internet bank has enough specialists to detect fraud and information theft	1	2	3	4	5
	I am not worried about being deceived into a fake website	1	2	3	4	5
	Current password generation is secure	1	2	3	4	5
	Sufficient guidance on password selection	1	2	3	4	5
	Customers are automatically locked out after failed login attempts	1	2	3	4	5
	Anxiety					
	I am afraid of high Internet connection cost	1	2	3	4	5
	I am afraid of being charged for Internet Banking	1	2	3	4	5
	I am worried about the inaccessibility of Internet Banking web pages	1	2	3	4	5
	I don't know how to use Internet Banking	1	2	3	4	5
	I am afraid of losing information by hitting the wrong key	1	2	3	4	5
	I am afraid of making mistakes that I cannot correct	1	2	3	4	5
	Internet Banking is intimidating to me	1	2	3	4	5
	Self-Efficacy					
	I use Internet Banking only if there is no one around me	1	2	3	4	5
	I use Internet Banking only if there is built-in help facility for assistance	1	2	3	4	5
	I use Internet Banking only if I could call someone for help	1	2	3	4	5
	I use Internet Banking only if I have a lot of time to learn and deal with the service	1	2	3	4	5
	Attitude toward Using Internet Banking					
	Internet Banking makes banking tasks more interesting	1	2	3	4	5
	I like working with Internet Banking	1	2	3	4	5
	It is a good idea to use Internet Banking in daily life	1	2	3	4	5
	Internet Banking is enjoyable	1	2	3	4	5
	Company Reputation					
	The bank is well-known	1	2	3	4	5
	The bank has a good reputation	1	2	3	4	5

	The bank offers good services	1	2	3	4	5
	Government Support					
	Government endorses the use of Internet and e-commerce	1	2	3	4	5
	The internet infrastructure and facilities such as bandwidth is sufficient for online banking	1	2	3	4	5
	The government has good regulations and laws for internet banking	1	2	3	4	5
	Trust Propensity/ Initial Trust					
	The company is trustworthy	1	2	3	4	5
	I believe in the information that this company provides me	1	2	3	4	5
	Internet banking always provides accurate financial services	1	2	3	4	5
	Internet banking always provides reliable financial services	1	2	3	4	5

Self-efficacy refers to an individual's belief in his or her capacity to execute behaviors necessary to produce specific performance attainments (Bandura, 1977, 1986, 1997)

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