Adoption of E-Banking in Bangladesh: Evolution, Status and Prospects

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Abstract—Electronic banking (e-banking) is the next-generation banking that electronically delivers a wide range of banking services where the physical presence of the customer at the bank premises is not required. With the advent of Internet connectivity and a number of security tools of e-commerce, the penetration of e-banking is increasing most of the developing countries, e.g., Bangladesh. Although there are different forms of e-banking, including Internet banking, telephone banking, mobile phone or Short Message Service (SMS) banking and Automatic Teller Machine (ATM) banking; Internet banking is the most cost-effective form of e-banking. The number of Internet users is geometrically increasing in Bangladesh. Moreover, the banks have started to invest in e-banking, specially in Internet banking. Although, Internet banking has immense potential in Bangladesh, it fails to attract the customers in general. In this paper, by carrying out an on-line survey, we study the existing e-banking facilities of Bangladesh, the use of this e-banking services and the challenges that need to be addressed for full-scale deployment of e-banking. By analyzing survey data we have identified the key reasons behind the slow spread out of e-banking services, and also prepared a number of recommendations to overcome the present hindrances.

Index terms—E-banking, e-commerce, customer satisfaction, survey data analysis, e-banking adoption.

I. INTRODUCTION

Electronic banking (e-banking) is the way of delivering any banking services through electronically [1]. It encompasses a wide range of banking services including all the services—traditional brick-and-mortar bank—can provide. Depending on the delivery channels [2], e-banking can be categorized in different groups, such as Internet banking, telephone banking, mobile phone or Short Message Service (SMS) banking, Automatic Teller Machine (ATM) banking, etc. The rapid growth of the usage of the Internet and the declining cost of the Internet bandwidth have emerged the Internet banking [3] the most popular and promising way of e-banking. Although, the Internet banking is a subset of e-banking [1], among the general users, there is a common misconception of considering it the only way of e-banking and thus, using it interchangeably with e-banking.

Although, e-banking has been around for many years through ATMs and telephone banking, more recently it gets the momentum due to the wide spread use of the Internet. Both customers and financial institutions could be benefitted through e-banking. Customers can access fast and convenient services around the clock, even from a remote place. On the other hand, banks and financial institutions can provide services more economically and efficiently. For example, a typical customer transaction costs about $1 in a traditional brick-and-mortar bank branch, while the same transaction costs $0.60 through a phone call and only about $0.02 through Internet banking [4]. Therefore, there exists vast demand of e-banking, specially Internet banking from both parties of the stakeholders (i.e., the customers and the banks).

E-banking has been successfully commenced in the developed countries many years ago: the first ATM machine started to operate in the USA in 1959 and the first home online banking services was set up in 1983 in the UK. However, in the developing countries the spread of e-banking is much limited due to many socioeconomic and technological factors including: lower penetration of information and telecommunication technology, the lower computer literacy, the ‘digital divide’ between the rich and poor, the different operational environments for public and private sector banks, problems of security and authentication, unfriendly law and regulation [5]. Note that not all these factors are equally manifested in every developing country and thus, for a specific region/country, the obstacles in the growth of e-banking need to be identified first.

In connection to this fact, the three research objectives of this paper are:

1) Summarize all the e-banking services provided by different banks in Bangladesh and also identify which services are being frequently used by the customers.
2) Analyze the usage pattern and identify the hindrances responsible for under utilization of some services.
3) Finally, provide some recommendations for the rapid growth of the overall e-banking services in Bangladesh.

To determine which e-banking services are being used frequently and also why customers prefer those services over other available services, we carry out a comprehensive, online survey. More than 80 participants, both male and female from a diverse age groups and educational background take part in the survey. By analyzing the survey data, we successfully identify the frequently used e-banking services and also determine why some other services failed to attract customers. The evaluations of the existing e-banking services will guide the administrators of the banks to re-engineer their services and also assist them to decide which services should be given more attention in future.

II. RELATED WORK

The development, adoption and prospects of e-banking in Bangladesh has been investigated by a number of researchers.
Fig. 1. The architecture of the banking network of Bangladesh

Here, we present the summary of some studies. Since, most of the developing countries have similar situations, in some studies, the scenario of Bangladesh has been considered as a case study. In [6], the researchers have found that the lack of infrastructure is the major issues for Internet banking. An empirical study to investigate the recent trend and development of the application of e-banking in Bangladesh has been presented in [7]. In the marketing point of view a survey-based study has been presented in [8]. The study demonstrates that the Bangladeshi customers have not enough knowledge in e-banking and the benefits they may receive through it. Small and medium enterprise (SMEs) might be benefitted through e-banking by reducing transaction costs and establishing greater control over bank accounts. A study to determine the relationship between the service quality and the customer satisfaction in the area of e-banking in Bangladesh has been carried out in [9].

The present banking situation and the scope and benefits of e-banking with compared to the existing system have been explained in [2]. Lack of secured communication is a major drawback of SMS-based mobile banking. In [10], an SMS-based banking scheme has been proposed that leverages the existing Internet based banking facility. A two-level security scheme–voice verification and digital watermarking–has been introduced.

Different e-banking services have not adequately flourished in Bangladesh. Researchers have identified some causes that are responsible for this slow deployment of e-banking. In the following we summarize the key findings identified in the existing work:

1) A reliable telecommunication infrastructure has not been built nation-wide. Specially, high-speed Internet connection is not available in every corner of the country.
2) Bangladesh need many IT professionals with experience in building and deploying e-banking services.
3) Since e-commerce and e-banking were not widely deployed before, new legislations and regulations need to be established and government policies need to be revised.
4) Due to lack of awareness, customers are not well informed about the benefits of e-banking.
5) The e-commerce and e-banking services should be free of any security breaches.

Fig. 2. The Internet banking architecture

III. BANKING NETWORK ARCHITECTURE

Similar to other networked institutions, a banking network should be equipped for communications in two frontiers: communications that is needed between internal nodes and interactions with external nodes. Figure 1 shows the architecture of a typical banking network that deploys different nodes that are needed to provide e-banking services.
For the electronic transactions that are limited within the bank, the internal network is protected by a core firewall that is connected with the core router. The server zone deploys different application servers, database servers, storages, network analysis tools (e.g., SNAP). The DMZ (demilitarized zone) deploys a number of servers that are being invoked by external entities through the Internet. In general practice, sensitive information and bank’s internal data are never deployed inside the DMZ.

ATM machines are established inside the branch offices and also at external premises. A branch office and the server zone is connected through a private, secured point-to-point connection, which is shown as the data link provider network between the branch router and the core router in Figure 1. The ATMs established inside a branch is connected with the server zone through this secured point-to-point connection.

The Internet banking architecture is shown in Figure 2. Internet banking customer may access the bank’s Web site using any device that is able to connect to the Internet through the access network. At the Web service provider’s network a Web server hosts the Web site of the bank. The customer access the Web site using one of the Web browsers. The Web service provider’s network is connected with the bank’s network through a secured, point-to-point connection. A third-party may provide this connection. Through this secured, private connection the Internet banking server (that resides between the Web server and the bank’s internal network) transfer sensitive information that perform transaction, account balance, bill payment, etc. Hence, the customer’s account related information is never being transferred through the public Internet and the security of the customer’s account is being maintained.

IV. PRESENT E-BANKING SERVICES IN BANGLADESH

E-banking might be implemented in the three main categories of e-commerce business models: Business-to-Consumer (B2C) (e.g., a customer is withdrawing cash from her bank), Business-to-Business (B2B) (e.g., funds being transferred from one bank to another) and Consumer-to-Consumer (B2C) (e.g., funds being transferred between two customers’ account). In this paper, we mainly focus four types of e-banking services from the B2C business model category: ATM-based banking, tele-banking, SMS-based banking and Internet banking.

A. ATM-based banking

ATM is a virtual teller point of a bank that performs most of the tasks of a teller, including cash deposit/withdraw, balance inquiry, show statement, etc. In Bangladesh, some multinational private banks incepted the ATM booth in Dhaka in 1992. In Bangladesh, for six years from 2004 to 2010, the indicator number of ATMs (per 100,000 adults) increased from 0.14 to 1.93, which implies that the number of ATMs is growing significantly [11].

B. Tele-banking

To access tele-banking services, customers have to dial a particular telephone number provided by the bank. A customer’s identity is verified by checking a PIN or security questions. The full service might be automated although an operator might be reached sometimes. A number of banking services could be realized through tele-banking including detailed account information, balance inquiry, information about products or services, ATM card activation, cheque book related services, bill payment, credit card services, etc.

C. SMS-based banking

SMS banking is a type of mobile banking, a technology-enabled service offering from banks to its customers, permitting them to operate selected banking services over their mobile phones using SMS messaging. SMS banking services are operated using both push and pull messages. Push messages are those that the bank chooses to send out to a customer’s mobile phone, without the customer initiating a request for the information. Typically push messages could be either Mobile marketing messages or messages alerting an event which happens in the customer’s bank account, such as a large withdrawal of funds from the ATM or a large payment using the customer’s credit card, etc.

D. Internet banking

Internet banking started by launching Web sites of the banks to provide different banking related information (e.g., different types of accounts, deposit schemes, interest rate, foreign exchange rate, location of nearest branches, etc.) to the customers. Soon after its inception, the customers’ accounts were integrated and thus could be operated after proper identity authentication of the customers. Internet banking if implemented in full scale would be highly appreciated by both customers and bank authorities. It would provide hassle free, 24 hours, secured e-banking services from anywhere with minimum cost. A number of banking services including account balance inquiry, fund transfer, opening or modifying term deposit account, cheque book or pay order request, exchange rate or interest rate enquiry, bill payment, etc. could be realized through Internet banking. In Bangladesh, Dutch-Bangla Bank Limited first started Internet banking in 2003.

E. Available services

At present around 50 public and private banks are operating in Bangladesh. Not all of them provide wide range of e-banking services. Table I summarizes the popular e-banking services offered by the major banks of Bangladesh. Note that the information provided in this table have been collected from various sources: yearly reports published by different banks, browsing the Web site of the banks and through personal communications with the employees of the banks. Due to limitation of space, in our list, we have included 15 banks that have large establishment. Here, A, T, S and I represent ATM, tele-banking, SMS-banking and Internet banking respectively.
A "X" sign represents the bank has not started that service through e-banking at this moment.

Table I clearly shows that the government owned and operated public banks are far behind with compared to the private banks in implementing different e-banking services for their customers. Another important observation is Internet based banking has been implemented most among different types of e-banking services.

V. SURVEY DATA ANALYSIS

Using Google Docs [12] the present study carried out an online survey that was designed to find out the answers of the following two questions:

1) Adoption of existing e-banking services.
2) Reasons behind the present trends.

Around 75 responders participated in the survey who use Dhaka based different public and private banks. The survey was composed of two sections: the first section collects the responders’ background information (e.g., gender, age, education level, etc.) and the next section accumulates the adoption of e-banking services in Bangladesh. In the following we present the survey results with our analysis.

A. Background information of the responders

Among the responders who completed the survey on-line, more than 70% were male. This is quite understandable while the number of female Internet users are much less than male users in Bangladesh. Moreover, it has been observed that young people from the age group 30-40 adopt the use of Internet more rapidly. The survey also gathered information about how frequently and for how long the responders use the Internet. Figure 3 reveals that more than 50% responders hardly use the Internet in their daily life.

B. Adoption of existing e-banking services

In this section of the survey, since the responders were allowed to chose more than one answers if they prefer, (in some questions) total number of responses might be higher than the number of responders (which is 70).

Figure 4 summarizes the relative popularity of the four e-banking technologies that we are focusing in our study.

<table>
<thead>
<tr>
<th>Bank</th>
<th>Account balance</th>
<th>Cash withdraw</th>
<th>Mini statement</th>
<th>Full statement</th>
<th>Utility payment</th>
<th>Fund transfer</th>
<th>Other services</th>
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<tbody>
<tr>
<td>AB Bank</td>
<td>[A][S][I]</td>
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<td>Bank Asia</td>
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<td>Brac Bank</td>
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<td>Dhaka Bank</td>
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<td>Dutch Bangla Bank</td>
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<td>Eastern Bank</td>
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<tr>
<td>HSBC Bank</td>
<td>[A][S][T][I]</td>
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<td>Islamic Bank</td>
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<td>*Janata Bank</td>
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<td>Mercantile Bank</td>
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<td>Prime Bank</td>
<td>[A][S][I]</td>
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<td>*Sonali Bank</td>
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<tr>
<td>Standard Chartered Bank</td>
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<tr>
<td>Trust Bank</td>
<td>[A][S][I]</td>
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<td>[I][S]</td>
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<tr>
<td>*Uttara Bank</td>
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</table>

* Public banks operated by Bangladesh Government.

TABLE I
AVAILABLE E-BANKING SERVICES OFFERED BY BANKS OF BANGLADESH
At present, ATM is the oldest e-banking technology and is the most popular among the users. After ATM, Internet banking is mostly used although the difference between the usage frequency of ATM and Internet is significant. The other two technologies—tele-banking and mobile banking—could not attract many customers and are hardly used by them.

Next, our study looks at which e-banking services are mostly accessed through ATM booths. Figure 5 shows that cash withdrawal and account balance inquiry are two services that customers mostly avail through ATM booths. Although hardly used by the customers, ATM could be used for utility bill payment and transferring funds. Note that these services are not provided by most of the banks through ATMs.

According to Figure 6 account balance inquiry is the most popular service that customers use through Internet banking. Other than that, fund transfer (within accounts of the customer herself under the same bank), view account statement and cheque book request are some useful services accessed through Internet banking.

C. Reasons behind the present trends

Information presented so far establish that at present, ATM is the only widely used e-banking technology although Internet banking is the emerging technology with great potential. Our next question to the responders was why ATM is widely used by the customers. Figure 7 shows that some of the reasons why ATM is being used widely are availability, no additional training is required and easy to use. Many ATM booths have been established all over Dhaka city and thus the banks have brought the ATM service very close to the users. People are using these machines for many years while the user interface is simple and they do not need any other training (e.g., computer or Internet knowledge) to operate these machines.

ATM is the first e-banking technology that has been initiated in Bangladesh more than 20 years ago. On the other hand, other e-banking technologies have been available for more than 10 years. However, the other technologies could not attract the customers as the ATM did. The survey investigated the reason(s) behind this failure. Figure 8 shows the major hindrance these technologies is facing is users are not well informed.

VI. DISCUSSION AND RECOMMENDATION

Among the four types of e-banking technologies, ATM is the oldest and most mature one. SMS and tele-banking are not widely deployed. SMS has inherent security problem and its use is very limited due to unfriendly user interface. The use of tele-banking is very limited only to those automated services that do not need human assistance. Otherwise, long
waiting time in queue, poor customer satisfaction and other problems fail to make tele-banking attractive to the customers in Bangladesh. Figure 4 also establishes the fact that after ATM, Internet banking is the most widely used e-banking technology. Previously we mentioned that it is also the cheapest way of e-banking [4]. Therefore, here we discusses how the use of Internet banking might be increased.

Internet banking has great future in Bangladesh. Most of the banks are providing at least some basic services through their Web site. The telecommunication infrastructure has significantly improved although not compared to the developed countries. Moreover, in last ten years, the number of Internet users has increased exponentially. Figure 9 shows that the number of Internet users in Bangladesh was 0.2 (per 100 people) in 2004. Only in six years, the number increased to 3.70 (per 100 people) in 2010. Figure 3 shows that 50% people spend more than two hours in the Internet. Our banks fail to bring Internet banking closer to this huge number of Internet users. Our survey also establishes the fact that e-banking or Internet banking is not widely used because the customers are not well-informed (see Figure 8).

The following recommendations will make the Internet banking a cost-effective tool for the banks and the customers as well:

- Inform the customers about the conveniences of Internet banking when they open an account. Most of the customers are not aware of how easy to operate Internet banking. The customers should be demonstrated and given hands-on training.
- The Web site of the Internet banking should be easy to navigate. The log-in and other activities should be similar to other user-friendly Web sites. Moreover, considering the slow Internet speed, the Web site should be lite-weight so that it would upload quickly.
- Since customers should have trust that their accounts are safe and free from hacking, the security of the Internet banking should be given the highest attention [13].
- A significant number of users access the Internet through their cell phones and other hand-held devices, which are equipped with small screen. The banks should develop separate mobile Web sites. Moreover, mobile apps might be built to provide quick, easy, secure access to customers’ bank accounts.
- The central bank (i.e., Bangladesh Bank) should update the legislations to allow fund transfer between two banks. This will increase the use of Internet banking.
- Provide more services through Internet banking including opening new accounts, maintaining investment, mortgage, buying/selling stocks in share market, transferring funds to/from foreign banks, etc. Internet banking should be a hassle-free, single entry point for all financial activities for the customers.

VII. CONCLUSION

The prospect of Internet banking is very good in Bangladesh while the number of Internet users are growing geometrically and most of the banks are investing in e-banking as well. This is the right time for the banks to introduce their e-banking services to their customers. The recommendations provided in the previous section could be used as guideline to develop step-by-step e-banking facilities. Although not included in this paper, mobile banking (a new trend of banking where an account is being fully operated through the customer’s cell phone without any intervene with a branch) is an emerging banking technology in Bangladesh.

REFERENCES