



A fundamental study on Evolution of Internet banking and its challenges in India

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Abstract: *This research is carried out with an aim to know that how internet banking are evolving all over the India and what are the major challenges it has to cope up in upcoming era. The data collection is based on secondary data available over the internet, books and literature available related to the Internet banking and it's challenges. The researchers have found that transformation is taking place almost in all categories of the banks. IT is playing a crucial role to create the drastic changes in the banking industry in the new private sector and foreign banks all over the world. The immense opportunities are also available for the banks if they change or modify and adopt new policies to combat the different recent challenges.*

Keywords: *Bank, Internet Banking, Information Technology, Private Banks, Foreign Banks, Internet Penetration, Psychological challenges, Technological challenges, Socio-Economic challenges, Operational challenges..*

I. HISTORY AND EVOLUTION OF E-BANKING

Internet banking has actually been around longer than most people think. It was introduced in the 1980's, but it really did not become popular until the mid 1990's.

The term online became popular in the late '80s and refers to the use of a terminal, keyboard and TV (or monitor) to access the banking system using a phone line. 'Home banking' can also refer to the use of a numeric keypad to send tones down a phone line with instructions to the bank. Online services started in New York in 1981 when four of the city's major banks (Citibank, Chase Manhattan, Chemical and Manufacturers Hanover) offered home banking services. Services never became popular except in France where the use of videotex (Minitel) was subsidised by the telecom provider and the UK, where the Prestel system was used.

The UK's first home online banking services were set up by the Nottingham Building Society (NBS) in 1983 ("History of the Nottingham" Retrieved on 2007-12-14.). The system used was based on the UK's Prestel system and used a computer, such as thebe Micro, or keyboard (Tan data Td1400) connected to the telephone system and television set. The system (known as 'Home link') allowed on-line viewing of statements, bank transfers and bill payments. In order to make bank transfers and bill payments, a written instruction giving details of the intended recipient had to be sent to the NBS who set the details up on the Home link system. Typical recipients were gas, electricity and telephone companies and accounts with other banks. Details of payments to be made were input into the NBS system by the account holder via

There have been significant developments in the e-financial services sector in the past 30 years. According to Devlin (1995), until the early 1970s functional demarcation was predominant with many regulatory restrictions imposed. One main consequence of this was limited competition both domestically and internationally. As a result there was heavy reliance on traditional branch based delivery of financial services and little pressure for change. This changed gradually with deregulation of the industry during 1980s and 1990s, whilst during this time, the increasingly important role of information and communication technologies brought stiffer competition and pressure for a faster pace of change.

The Internet is a relatively new channel for delivering banking services. Its early form 'online banking services', requiring a PC, modem and software provided by the financial services vendors, were first introduced in the early 1980s. However, it failed to get widespread acceptance and most initiatives of this kind were discontinued. With the rapid growth of other types of electronic services since mid 1990s, banks renewed their interest in electronic modes of delivery using the Internet. The bursting of the Internet bubble in early 2001 caused speculation that the opportunities for Internet services firms had vanished. The "dot.com" companies and Internet players struggled for survival during that time but e-commerce recovered from that shock quickly and most of its branches including e-banking have been steadily, and in some cases dramatically, growing in most parts of the world. One survey conducted by the Tech Web News in 2005 (Tech Web News, 2005) found e-banking to be the fastest growing commercial activity on the Internet. In its survey of Internet users, it found that 13 million Americans carry out some banking activity online on a typical day, a 58 percent jump from late 2002.

The spread of online banking has coincided with the spread of high-speed broadband connections and the increasing maturation of the Internet user population. Another factor in e-banking growth is that banks have discovered the benefits of e-banking and have become keener to offer it as an option to customers.



The fast advancing global information infrastructure (including information technology and computer networks such as the Internet and telecommunications systems) enable the development of electronic commerce at a global level. The nearly universal connectivity which the Internet offers has made it an invaluable business tool. These developments have created a new type of economy, which many call the 'digital economy'. This fast emerging economy is bringing with it rapidly changing technologies, increasing knowledge intensity in all areas of business, and creating virtual supply chains and new forms of businesses and service delivery channels such as e-banking.

As a direct consequence of the emergence of the 'digital economy', the balance of power seems to be shifting to the customers. Customers are increasingly demanding more value, with goods customized to their exact needs, at less cost, and as quickly as possible. To meet these demands, businesses need to develop innovative ways of creating value which often require different enterprise architectures, different IT infrastructures and different way of thinking about doing business. This transformation of business from an old company to a new agile electronic corporation is not easy and requires a lot of innovative thinking, planning and investment.

II. RESEARCH OBJECTIVE

- This research is carried out with an aim to know that how internet banking are evolving all over the India and what are the major challenges it has to cope up in upcoming era.

III. INTERNET IT'S BASIC STRUCTURE AND ITS TECHNOLOGY

1. **Internet** is a vast network of individual computers and computer networks connected to and communicate with each other using the same communication protocol – TCP/IP (Transmission Control Protocol / Internet Protocol). When two or more computers are connected a network is created; connecting two or more networks create 'inter-network' or Internet. The Internet, as commonly understood, is the largest example of such a system. Internet is often and aptly described as 'Information Superhighway', a means to reach innumerable potential destinations. The destination can be any one of the connected networks and host computers.
2. **Internet** has evolved to its present state out of a US Department of Defense project ARPA Net (Advanced Research Project Administration Network), developed in the late 1960s and early 1970s as an experiment in wide area networking. A major perceived advantage of ARPA Net was that the network would continue to operate even if a segment of it is lost or destroyed since its operation did not depend on operation of any single computer. Though originally designed as a defence network, over the years it was used predominantly in areas of scientific research and communication. By the 1980s, it moved out of Pentagon's control and more independent networks from US and outside got connected to it. In 1986, the US National Science Foundation (NSF) established a national network based on ARPA protocol using commercial telephone lines for connectivity. The NSF Net was accessible by a much larger scientific community, commercial networks and general users and the number of host computers grew rapidly. Eventually, NSF Net became the framework of today's Internet. ARPA Net was officially decommissioned in 1990.
3. It has become possible for innumerable computers operating on different platforms to communicate with each other over Internet because they adopt the same communication protocol, via, TCP/IP. The latter, which stands for 'Transmission Control Protocol / Internet Protocol', is a set of rules which define how computers communicate with each other. In order to access Internet one must have an account in a host computer, set up by any one of the ISPs (Internet Service Providers). The accounts can be SLIP (Serial Line Internet Protocol) or PPP (Point to Point Protocol) account. These accounts allow creating temporary TCP/IP sessions with the host, thereby allowing the computer to join the Internet and directly establish communication with any other computer in the Internet. Through this type of connection, the client computer does not merely act as a remote terminal of the host, but can run whatever programs are available on the web. It can also run several programs simultaneously, subject to limitations of speed and memory of the client computer and modem. TCP/IP protocol uses a unique addressing scheme through which each computer on the network is identified.
4. **TCP / IP protocol:** TCP /IP protocol is insecure because data packets flowing through TCP / IP networks are not normally encrypted. Thus, anyone who interrupts communication between two machines will have a clear view of the data, passwords and the like. This has been addressed through Secured Socket Layer (SSL), a Transport Layer Security (TLS) system which involves an encrypted session between the client browser and the web server.
5. **FTP:** or File Transfer Protocol is a mechanism for transferring files between computers on the Internet. It is possible to transfer a file to and from a computer (ftp site) without having an account in that machine. Any organization intending to make available to public its documents would normally set up a ftp site from which any one can access the documents for download. Certain ftp sites are available to validated users with an account ID and password.
6. **E-mail:** The most common and basic use of Internet is the exchange of e-mail (electronic mail). It is an extremely powerful and revolutionary result of Internet, which has facilitated almost instantaneous communication with people in any part of the globe. With enhancements like attachment of documents, audio, video and voice mail, this segment of Internet is fast expanding as the most used communication medium for the whole world. Many websites offer e-mail as a



free facility to individuals. Many corporate have interfaced their private networks with Internet in order to make their e-mail accessible from outside their corporate network.

7. **World Wide Web (WWW):** Internet encompasses any electronic communication between computers using TCP/IP protocol, such as e-mail, file transfers etc. WWW is a segment of Internet, which uses Hyper Text Markup Language (HTML) to link together files containing text, rich text, sound, graphics, video etc. and offers a very convenient means of navigating through the net. It uses hypertext transfer protocol (HTTP) for communication between computers. Web documents are referred to as pages, can contain links to other related documents and so on, in a tree like structure. The person browsing one document can access any other linked page. The web documents and the web browsers which are the application programs to access them are designed to be platform independent. Thus any web document can be accessed irrespective of the platform of the computer accessing the document and that of the host computer. The programming capabilities and platform independence of Java and Java applets have further enriched the web. The 'point and click' method of browsing is extremely simple for any lay user of the net. In fact, the introduction of web since early 1990 has made Internet an extremely popular medium and its use in business has been enhanced dramatically.
8. **Wireless Application Protocol (WAP):** WAP is the latest industry standard which provides wireless access to Internet through handheld devices like a cellular telephone. This is an open standard promoted by WAP forum and has been adopted by world's all major handset manufacturers. WAP is supplemented by Wireless Application Environment (WAE), which provides industry wise standard for developing applications and services for wireless communication networks. This is based on WWW technology and provides for application for small screens, with interactive capabilities and adequate security. Wireless Transaction Protocol (WTP), which is the equivalent of TCP, sets the communication rules and Wireless Transport Layer Security (WTLS) provides the required security by encrypting all the session data. WAP is set to revolutionize the commercial use of net.
9. **Securities:** One of the biggest attractions of Internet as an electronic medium is its openness and freedom. It is a public domain and there is no restriction on who can use it as long as one adheres to its technical parameters. This has also given rise to concerns over the security of data and information transfer and privacy. These concerns are common to any network including closed user group networks. But over the Internet, the dimensions of risk are larger while the control measures are relatively fewer.

IV. INTERNET BANKING IN INDIA

In this internet age, internet banking is the most preferred choice of banking for majority of customers. Is this customer being an individual or a body corporate. The financial products and services have become available over the Internet, which has thus become an important distribution channel for a number of banks. Banks boost technology investment spending strongly to address revenue, cost and competitiveness concerns. A study on the Internet users, conducted by Internet and Mobile Association of India (IAMAI), found that about 23% of the online users prefer IB as the banking channel in India, second to ATM which is preferred by 53%. Out of the 6,365 Internet users sampled, 35% use online banking channels in India. This shows that a significant number of online users do not use IB, and hence there is a need to understand the reasons for not using it. Until the advent of ATMs, people were unaware and/or not directly affected by the technological revolutions happening in the banking sector. ATMs became the major revelation for customers, since it offered the facility to avoid long queues in front of the cashiers in banks. It also provided them the flexibility of withdrawing money— anytime, anywhere. In the study by IAMAI, it was found that the people are not doing financial transactions on the banks' Internet sites in India because of reasons such as security concerns (43%), preference for face-to-face transactions (39%), lack of knowledge about transferring online (22%), lack of user friendliness (10%), or lack of the facility in the current bank (2%).

The Reserve Bank of India constituted a working group on Internet Banking. The group divided the internet banking products in India into 3 types based on the levels of access granted. They are:

❖ **Information Only System:**

General purpose information like interest rates, branch location, bank products and their features, loan and deposit calculations are provided in the banks website. There exist facilities for downloading various types of application forms. The communication is normally done through e-mail. There is no interaction between the customer and bank's application system. No identification of the customer is done. In this system, here is no possibility of any unauthorized person getting into production systems of the bank through internet.

❖ **Electronic Information Transfer System:**

The system provides customer-specific information in the form of account balances, transaction details, and statement of accounts. The information is still largely of the 'read only' format. Identification and authentication of the customer is through password. The information is fetched from the bank's application system either in batch mode or off-line. The application systems cannot directly access through the internet.

❖ **Fully Electronic Transactional System:**

This system allows bi-directional capabilities. Transactions can be submitted by the customer for online update. This system requires high degree of security and control. In this environment, web server and application systems are linked over secure

infrastructure. It comprises technology covering computerization, networking and security, inter-bank payment gateway and legal infrastructure.

The six primary drivers of Internet banking is very well defined by Dr. Mishra (Mishra, 2002), in order of primacy are:

- Improve customer access
- Facilitate the offering of more services
- Increase customer loyalty
- Attract new customers
- Provide services offered by competitors
- Reduce customer attrition

As of 2013, India has the third largest number of Internet users. It is next to the United States and China in terms of sheer number of users. While there is no concrete data available, India is expected to have in excess of 125 million users by 2013 end.

Due to large population of India, there are a significant number of users of Internet in India, which shows the possibilities of Internet Banking in India. Although percentage wise the number is too low compared to developed countries of the world. This table speaks all about that:

Table-1.1
Internet Penetration in Selected Countries of the world

Countries	Internet Penetration in %	Active users (in Millions) 2013 (Estimate)
China	40	511
United States	78	240
India	11	120
Japan	80	101
Brazil	47	89
Russia	50	70
Germany	84	67
France	80	52
United Kingdom	84	51

E- Banking play a pivotal role in E-Commerce but it has tremendous challenges as well as noted by Saleh M. Nsouli and Andrea Schaechter (Nsouli and Schaechter, 2002) 5 in their article Challenges of the "E-Banking Revolution" of Finance and Development (September 2002, Volume 39, Number 3)

If we talk about financial inclusion in India, then as per RBI Bulletin published in February 2013, there are about 95,000 bank branches, about equal number of ATMs across the country and 278 million debit cards. Yet a large proportion of our population remains financially excluded. Data indicates that only about 40 percent of the adult population in the country has a bank account; only 25,000 plus villages have a bank branch out of the 600,000 villages in the country. Only 13 percent of the people have a debit card and only two percent have a credit card.

Table –1.2

Select indicators of FI : cross-country comparison				
Country	Number of branches (per 0.1 million adults)	Number of ATMs (per 0.1 million adults)	Bank loan as per cent of GDP	Bank deposits as per cent of GDP
India	10.64	8.90	51.75	68.43
Australia	29.61	166.92	128.75	107.10
Brazil	46.15	119.63	40.28	53.26
France	41.58	109.80	42.85	34.77
Mexico	14.86	45.77	18.81	22.65
U.S.	35.43	-	46.83	57.78
Korea	18.80	-	90.65	80.82
Philippines	8.07	17.70	21.39	41.93

(Source: Report on Trend & Progress of Banking in India, Reserve Bank of India 2011-12)



V. TYPES OF INTERNET BANKING

Understanding the various types of Internet banking will help examiners assess the risks involved. Currently, the following three basic kinds of Internet banking are being employed in the marketplace.

1) Informational: This is the basic level of Internet banking. Typically, the bank has marketing information about the bank's products and services on a stand-alone server. The risk is relatively low, as informational systems typically have no path between the server and the bank's internal network. This level of Internet banking can be provided by the banks or outsourced. While the risk to a bank is relatively low, the server or web site may be vulnerable to alteration. Appropriate controls therefore must be in place to prevent unauthorized alterations to the bank's server or web site.

2) Communicative: This type of Internet banking systems consists of the interaction between the bank's system and the customer. The interaction maybe limited to electronic mail, account enquiry, loan applications, or static file updates (name and address change). Because these servers may have a path to the bank's internal networks, the risk is higher with this configuration than with informational systems. Appropriate controls need to be in the place to prevent, monitor, and alert management of any unauthorized attempt to access the bank's internal networks and computer systems. Virus controls also become much more critical in this environment.

3) Transactional: This level of Internet banking allows customers to execute transactions. Since a path typically exists between the server and the bank or outsourcer's internal network, this is the highest risk architecture and must have the strongest controls. Customer transactions can include accessing accounts, paying bills, transferring funds etc.

Various authors define E-Banking differently but the most definition depicting the meaning and features of E-Banking are as follows.

1. Banking is a combination of two, Electronic technology and Banking.
2. Electronic Banking is a process by which a customer performs banking Transactions electronically without visiting a brick-and-mortar institutions.
3. E-Banking denotes the provision of banking and related service through Extensive use of information technology without direct recourse to the bank by the customer.

E-banking is a borderless entity permitting anytime, anywhere and anyhow banking. This facilitates us with all the functions and many advantages as compared to traditional banking services. During this step of the process, controls that could mitigate or eliminate the identified risks, as appropriate to the organizations operations, are provided. The goal of the recommended controls is to reduce the level of risk to the IT system and its data to an acceptable level.

VI. CHALLENGES OF E-BANKING

Although a lot of reforms have been made in the personality of the banks, there is a need to modify polices of the bank. At present they are facing many internal and external challenges, which are hindering their performance, but the banks can convert these challenges into opportunities with care and some modifications. With globalization and change in the technology, world over have become closely integrated. Customers can access their accounts anywhere and anytime across the world! Deregulation and liberalization has opened up new opportunities for banks but at the same time the pressure of competition have led to narrowing spreads, shrinking, consolidation and restructuring. Banking practices have undergone significant changes since the advent of the Internet. Banks provide many services online, which are extremely convenient for banking customers. However, Internet banking (also known as electronic or e-banking) also poses some risks to the banks and banking customers who choose to use it. There are so many challenges like

Psychological: Our society is conservative and the people usually habit to use traditional banking and they do not want to accept the changes immediately. After a long experience of using traditional banking, they form the habits and that is why they need some time to change their habit. Due to lack of knowledge or the technological unawareness, customers have hesitation to use internet banking. Sometimes they are suffering from frustration due to lack of technical knowledge. Typical mind set and tradition also a big challenge!

Technological: Popularity of E-banking has a challenge because of insufficient technology! Poor network create lot many disturbances while using the internet or net-banking. So the customer loses their confidence and avoids the use of e-banking services. Less awareness regarding technical knowledge is also a barrier between the e-banking services and the customer. There are many fault in the technical design, implementation and monitoring bank's information system and it will makes the e-banking service slow and sometime difficult for the users.

Socio-Economic: Banks have a challenge of the cost factor and its effect on the use and popularity of e-banking services. Customers not ready to pay the charges for using banking services. Vast rural branch network of banking is also a big challenge because rural customer slowly accepts the e-banking. Concept of social banking is also creating the barrier from the customer side and low profitability creates challenge. Lack of customer relationship management is also one of the big challenges against the popularity of e-banking services.



Regulation and Legalities: Internet banking makes it possible for banks and their customers to do business from anywhere in the world. This greatly increases the bank's potential client base. Nevertheless, according to Andrea Schaechter of All Business, the global approach to banking that e-banking permit makes it extremely difficult for regulatory authorities to enforce finance laws. Additionally, regulations differ from nation to nation and banks are not always proficient in the financial laws for every nation in which they have business this lack of proficiency opens banks and their clients up to law violations and lawsuits.

Digital and Financial Divide: Rupa Rege Nitsure, author of "E-banking: Challenges and Opportunities," claims that a digital divide exists between banks -- i.e., not every bank has access to the hardware and software necessary to make e-banking possible. A study led by Jiaquin Yang of Georgia College and State University showed that this problem may be related to size and financial support a bank has. Smaller banks tend not to use e-banking because it is not cost-effective for them. To make Internet banking more commercially fair to banks and customers, all banks would need a sufficient funding source so that banks could eliminate this digital divide.

Security: E-banking increases convenience, but as it also opens a bank to security issues. For example, a criminal might hack into the bank's server in order to acquire bank account data, or a software glitch might cause the bank to unwittingly distribute personal data to the wrong person. To make matters worse, technology is not static. Banks that use Internet banking have to constantly update their software and hardware to make sure that compatibility issues and increased knowledge of security systems do not increase their security risks. This can be expensive over time.

Reputation: Problems such as governance and security have the potential to make a bank look bad to clients. Additionally, the more a bank relies on Internet banking, the more the bank may gain an impersonal feel. Both of these problems may discourage clients from choosing a bank that relies on e-banking, regardless of how convenient e-banking may be.

Operational challenges:

1. Frequent challenges in technologies used focusing up grades in hardware and software, Attending to that implementation issues and timely role out.
2. Managing technology security and business risks.
3. System re-engineering to enable defined and implemented efficient processes to be Able to reap benefits off technology to its fullest potential.
4. Upgrading the skill of work force spread across the country.

VII. HOW TO MEET CHALLENGES?

At corporate level to meet the challenges, various initiated have been taken and implementation is in process beside up gradation of data center facility:

1. Centralization of function :

- ❖ Inward clearing data uploading and processing.
- ❖ Cheque-book issues.
- ❖ MIS-On-Line monitoring of statements by controlling offices
- ❖ Audit from the remote location
- ❖ Sending mails and statement of account to customers and completion of non mandatory field in newly opened account.

2. Single window system.

- ❖ Revised account opening form for capturing complete customer/account data as per CBS requirement.
- ❖ Call centres for customers.
- ❖ Customer relationship management (CRM) application.
- ❖ Data warehousing.
- ❖ Organize Awareness program
- ❖ Sound technological side
- ❖ Improve security standard
- ❖ Create customer orientation
- ❖ Encourage e-banking users

VIII. CONCLUSION

The research leads to some significant contributions were that transformation is taking place almost in all categories of the banks. This will helpful to cope up with new and the latest financial policies of the banks. IT is playing a crucial role to create the drastic changes in the banking industry in the new private sector and foreign banks all over the world. The immense opportunities are also available for the banks if they change or modify and adopt new policies to combat the different recent challenges.



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