

# **INTERNET BANKING IN INDIA: A GLIMPSE OF ITS ADOPTION AND IMPLEMENTATION IN INDIA THROUGH CASE STUDIES**

Sonal Chawla

*Lecturer, Deptt of computer science and Applications  
Panjab University ,Chandigarh.  
India*

## **ABSTRACT**

Electronic banking is an activity that is not new to the banks or its customers in India. Banks have been providing their services to customers electronically for years through software programs. These software programs allowed users personal computer to dial up the bank directly. In the past, however, banks have been very reluctant to provide their customers with banking via the Internet due to security concerns. Today, the scenario in India has changed. The banks now seem to be jumping the bandwagon of Internet banking. Why is there a sudden increase of bank's interests in the Internet? The paper looks at these issues and therefore, has a fourfold objective. Firstly, the paper studies the evolution of modern day banks and the current state of banking in India. Secondly, it looks at the role of Information technology in this technology change. Thirdly, the paper compares the adoption and implementation of Internet banking in India through the case study of two banks. One of the banks under study is the most popular and emerging private bank (i.e. HDFC bank) that has been a front-runner in the adoption of Internet Banking and the other is a nationalized bank (i.e. Punjab National Bank), which is the first amongst the nationalized banks to have begun Internet banking. Fourthly, the paper concludes discussing the problems of Internet Banking thereby pinning hope that Internet Banking shall evolve and within no time shall become the most popular channel of banking in India.

## **KEYWORDS**

Internet banking, E-banking, PNB, HDFC, India.

## **1. INTRODUCTION**

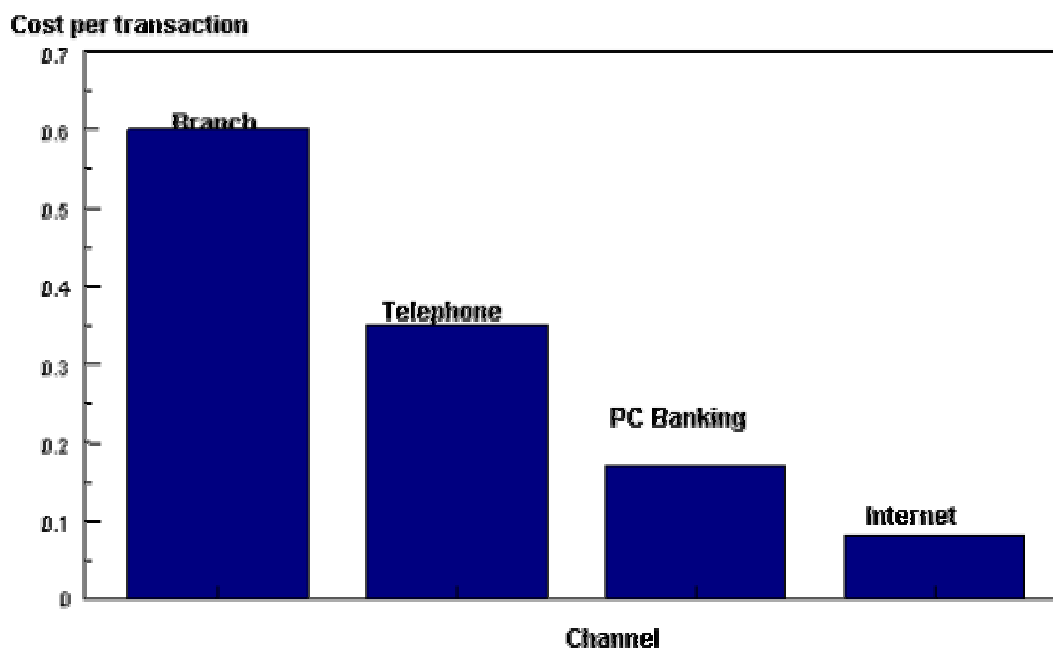
The Banking sector in India has experienced a rapid transformation. Just about a decade back this sector was limited to the nationalized and co-operative banks. Then came the multi-national banks, but these were confined to serving an elite few. One could regard the past as the 'medieval ages' in the banking industry, wherein every branch of the same bank acted as an independent information silo, and multi-channel banking (ATMs, Net banking, tele-banking, etc) was almost non-existent [7]. The first major reason for this transformation is because of the improved security and encryption methods developed on the Internet. The second reason is that banks do not want to lose a potential market share to banks that are quick to offer their services on the Internet.

### **1.1 Evolution of Modern banking**

The evolution of modern banking technology began with the use of Advanced Ledger Posting Machines (ALPM) in the 1980s. The Reserve bank of India which is a regulatory central body under whom various public sector banks, financial institutions, NBFCs etc work in India had then advised all banks to go in for massive computerization at the branch level [9]. Two options were put forth i.e. either to automate the front office or back office. Many banks opted for automating the front office ALPM in the first phase. Banks like State Bank of India, which is a public sector commercial bank, concentrated on the back office automation at the branch level. The Rangarajan committee report of 1985 ensured that banks had to get computerized [1].

The second wave of development called for Total Bank Automation (TBA) in late 1980s. This automated both the front-end and back-end operations within the same branch. TBA comprised of total automation of a particular branch with its own database. In the third wave, the new private sector banks entered the field. These banks opted for a different model of having a single centralized database instead of having multiple databases for all their branches. This was possible due to the availability of good network infrastructure. In the beginning of the 1990s, leased line costs were coming down. The DoT was expanding its capacity and new technologies were being implemented. Earlier, banks were not confident of running the whole operation through a single data center. However, when a couple of private sector banks implemented it efficiently, other banks began to show an interest, and they also began consolidating their databases into a single database [8]. Banks followed up on this move by choosing suitable application software that would support centralized operations. The fourth wave started with the evolution of the ATM delivery channel.

This was the first stage of empowerment of the customer for his own transactions. The second stage was the Suvidha experiment in Bangalore city of India. This showed the power of technology and how the reach can be increased phenomenally at a great pace. Seeing these, all the banks started revamping their retail delivery channels. Their core focus became the number of customers they can service at lower cost. The main channels for these were channels such as Internet Banking and mobile banking [2]. After this came alliances for payment through various gateways. The third important development happening now is the real-time gross settlement system of the RBI. Once this is in place, transactions between banks can be done through the settlement system, online, electronically. So the collections will become very fast. Five years from now, majority of the transactional services will be provided by way of Internet. Net-based banking comes at only 10 percent of the operating costs of conventional banking practices and services. As banks are going to play a key role in IT enabled public services involving electronic money transactions we feel that cooperative banks should consider NET-Banking in a big way. [6]. A cost comparison study done by IBM global services consulting group clearly shows the advantage of using Internet as medium for banking services over other traditional mediums (fig 1).



## 1.2 Current state of banking

The opening up of the Indian banking sector to private players acted as 'the tipping point' for the transformation. The deregulatory efforts prompted many financial institutions (like HDFC and ICICI) and non-financial institutions enter the banking arena. With the entry of private players into retail banking and with multi-nationals focusing on the individual consumer in a big way, the banking system underwent a

phenomenal change. Multi-channel banking gained prominence. For the first time consumers got the choice of conducting transactions either the traditional way (through the bank branch), through ATMs, the telephone or through the Net. Technology played a key role in providing this multi-service platform. The entry of private players combined with new RBI guidelines forced nationalized banks to redefine their core banking strategy. And technology was central to this change.

### **1.2.1 Role of IT in this phenomenal technology change**

IT is central to banking. This is one of the major reasons why new private and multi-national banks have been able to survive, thrive, and adapt in an increasingly competitive space. These banks were able to leverage on low-cost channels such as ATMs and Net banking to the optimum levels contributing to reduced operating costs. Banks have realized that shifting customer access to lower cost channels can help bring down operating costs. But this does not mean that branch banking is obsolete. Rather, banks are reinventing their business models to offer new financial services through its branches. Banks are looking at newer ways to make a customer's banking experience more convenient, efficient, and effective. They are using new technology tools and techniques to identify customer needs and are offering tailor-made products to match them. Centralized operations and process automation using core banking applications and IP-based networks improve efficiency and productivity levels tremendously. Core banking applications help a bank to shift from 'branch banking' to 'bank banking.' This basically means that a customer will be treated as a bank's customer than just the customer of a particular branch, which was the case earlier. Also, IP-based networks let a bank offer multiple services over the same network, resulting in costs savings. CRM solutions, if implemented and integrated correctly, can help significantly in improving customer satisfaction levels. Data warehousing helps in providing better transaction experiences for customers over different transaction channels. This is made possible because data warehousing helps bring all the transactions coming from different channels under a common roof. Data mining helps banks analyze and measure customer transaction patterns and behavior. This can help a lot in improving service levels and finding new business opportunities. Risk Assessment is another area where technology plays a major role. The core issues faced by banks today are on the fronts of customer's service expectations, cutting operational costs, and managing competition. Technology helps banks in meeting these objectives. A data warehouse can help the bank get a single view of its data across disparate systems. This comes in handy since most banks have data spread over several disparate, sometimes legacy systems. If the data is spread across different systems, a transaction done on one system will not be reflected in the other. This is not a very desirable situation when it comes to multi-channel banking. Data warehousing solves these by integrating all the data into a common warehouse (usually an RDBMS). The multiple data coming in from different systems is converted into a common format using the ETL (Extraction, Transformation, Loading) process. This provides a single repository from which banks can view or use information when required. So they have the information in place with the warehouse but how do they make sense out of it? This is where data mining steps in. Data mining can help you recognize patterns in the data you have. For example, how many of the customers have a two wheeler and earn more than Rs 15,000 a month? The answer to this question will give you a list of prospective customers to whom you can offer a car loan. Just give the query to the data-mining tool and the answer is there in a jiffy.

### **1.3 The newest way of banking**

Internet banking is the most effective way of banking. The bank-to-customer relationship changes significantly, with open standards replacing proprietary front ends, many-to-many networks substituting for single-line links, and traditional lock-ins eroding, so that corporates enjoy lower switching costs. Corporations source globally and seek the best-of-breed. Corporate customers have the freedom to unbundle their corporate banking purchases, selecting the best of breed for each requirement, geographically and functionally, and using integrated front-ends to manage the complexity of multiple providers.

## **2. LET US NOW COMPARE THE IT JOURNEY OF TWO OF THE LEADING BANKS OF INDIA I.E. PNB AND HDFC.**

### **2.1 Punjab National Bank**

Punjab National Bank's (PNB's) , a public sector commercial bank, has come a long way since March 2000, when IT systems were deployed only at 500-odd branches, and was very disparate. Only 35 percent of the bank's business was computerized and a number of small software packages ran on standalone PCs. Now in 2003, PNB had 101 branches on a WAN, deployed a core banking infrastructure, and runs 175-networked ATMs. It has also deployed a reliable security infrastructure that helps it conduct transactions within its branches without worry. The journey doesn't end here, but along the way the banks picked up valuable knowledge and experience.

#### **2.1.1 Network design**

Cisco has tied up with PNB to evolve the network design and implement a nationwide network backbone to connect all its offices. Cisco will assist the bank in understanding and implementing the various technologies associated with the project. The converged network infrastructure will allow PNB to standardize the applications and software needed to provide the banking services. The network infrastructure will have a three-tier architecture. The network hub will be in its data center. The various branches would be connected to the data center using new world routing and switching technologies.

#### **2.1.2 Moving to Internet banking**

PNB got a license from RBI to offer Internet banking services. Some of the RBI preconditions were that the systems should be audited by an independent auditor, and an independent and authentic agency must carry out penetration testing. The bank has already had its systems audited by an external agency, and the penetration testing process is still going on. In the process, PNB has developed the skills of its own personnel to take charge of security on their own at a later stage. The bank will also recruit technically trained staff to provide the necessary knowledge pool. With the Internet banking launch, the bank will also strengthen its security policy.

### **2.2 HDFC Bank**

A private sector bank, had a centralized IP-based network right since its inception. All branches across the country converge at their respective zonal hub location, which in turn connects to the data center at Mumbai.

#### **2.2.1 Network**

Based on the bank's hub & spoke architecture for the network, the branches are distributed under different regions and each major location has a regional hub. The branches falling under a location connect to the hub at the main region. These hubs then connect to the central site (data center) using a combination of 2 Mbps and 64 Kbps pipes, depending on the total volume of the transactions that pass through.

A highlight of HDFC Bank's network is the presence of two or more hubs in one location.

#### **2.2.2 A step ahead**

In the coming years HDFC Bank plans to deploy connections, with built-in redundancy in the network. The bank has tested CDMA and GSM solutions—especially for ATMs as they consume very small bandwidths. The bank's servers have also undergone phases of development inline with the bank's expansion plans. The bank uses separate software for corporate and retail banking .On the corporate side HDFC Bank started with MicroBanker and then moved to Flexcube in 2002. They use Flexcube UBS, which operates on a Compaq Alpha box-GS160. This database was also on DAS and was moved to SAN over last year

(December 2002). The bank uses SAN solutions from Hitachi Data Systems. On the retail side the bank uses Finware from i-flex solutions. The bank did not face any serious migration issues as they use upgraded products or new products usually from the same vendors. The vendors have programs that enable the migration or upgrades.

### 2.2.3 Pre-Internet banking

Security concerns during the pre-Internet period had more to do with the internal activities of a business. Right from the early days technology solutions—like banking applications for mainframes, AS400 or Unix—had lot of security built-in. Transactions that are directed from the branch to the main server are encrypted; there are individual passwords, and numerous functions have two levels of authorization. Thus security in banking, to a large extent, is built into the software or the application itself.

### 2.2.4 Internet banking

The moment a business opens up through a medium like Internet, external security becomes of prime importance. One has to start considering protection tools like firewalls, IDS, and others. Ram informs that HDFC Bank has a mechanism in place where a third-party is hired to manage their entire security. This third-party is constantly onsite looking at logs, making the required changes, as there are patches and upgrades being constantly released, and it is imperative to incorporate all of these. The bank also has safety measures in terms of who has access, or who is authorized to access certain kinds of data. Security is directly related to the business. The banking systems over the years have been built with lots of security concern based on the kind of business they do. Security is not limited to hardware and software—premise security also plays an equally important role. Physical access is combined with data access. One has to have swipe cards to access the area where the data is. Thus there is lot of emphasis on access control mechanisms, which is in fact physical security.

Following table summarizes the features offered by the two banks used as case studies above.

S.no	Parameters	HDFC	PNB
1.	<b>Real-time, online banking</b>	Real-time means instant up-to-the-second account transactions displayed on the Internet. HDFC Bank is among the first in India to enable such high-tech connectivity.	Facility not provided
2.	<b>Facility to view all your online accounts on one screen</b>	This is a powerful feature for our Net Banking customers being introduced for first time in India - OneView. With OneView you can view not only your HDFC Bank accounts but also your ICICI Bank and Citibank accounts at the same time on one screen! You can also use this service to view multiple HDFC Bank accounts on one screen. This FREE service is available only to HDFC Bank customers who are registered for NetBanking	Facility not provided
3.	<b>Security</b>	NetBanking uses 128-bit encryption Secure Socket Layer (SSL) technology, one of the most secure forms of transacting and the highest level of security commercially available on the Internet	Facility provided

4.	<b>Up-to-the-second account balance/statement inquiry</b>	<b>Facility provided</b>	Facility provided
5.	<b>Request for a new Fixed Deposit</b>	<b>Facility provided</b>	Facility provided
6.	<b>Request for a cheque book,</b>	<b>Facility provided</b>	Facility provided
7.	<b>Request for Demand Draft/Banker's Cheques</b>	<b>Facility provided. Delivered at the doorsteps of the customer</b>	Facility not provided
8.	<b>Free Online Third-Party Transfer facility</b>	<b>Facility provided</b>	Facility provided
9.	<b>Convenience of paying your utility bills</b>	<b>Facility provided for electricity and water bills</b>	Facility not provided
10.	<b>Demat on the NET</b>	<b>Facility provided</b>	Facility not provided
11.	<b>Credit card Payment</b>	<b>Facility provided</b>	Facility provided
12.	<b>Statement Download</b>	<b>Facility provided for an account statement of 5 months</b>	Facility provided
13.	<b>Change Customer profile</b>	<b>Facility provided</b>	Facility provided
14.	<b>Third Party Transfer</b>	<b>Facility provided</b>	Facility provided
15.	<b>New Fixed Deposit Request</b>	<b>Facility provided</b>	Facility provided
16.	<b>Fixed Deposit Inquiry</b>	<b>Facility provided</b>	Facility provided
17.	<b>Banker's Cheque Request</b>	<b>Facility provided</b>	Facility provided
18.	<b>TDS Inquiry</b>	<b>Facility provided</b>	Facility provided
19.	<b>Stop Payment Request</b>	<b>Facility provided</b>	Facility provided
20.	<b>Cheque Status Inquiry</b>	<b>Facility provided</b>	Facility provided
21.	<b>Account Balance Inquiry</b>	<b>Facility provided</b>	<b>Facility provided</b>
22.	<b>Account Statement Inquiry</b>	<b>Facility provided</b>	<b>Facility provided</b>
23.	<b>Customer Support</b>	<b>Facility provided</b>	<b>Facility provided</b>
24.	<b>Direct Pay</b>	<b>Facility provided</b>	<b>Facility provided</b>

### 3. CONCLUSION

Today banking in India is not limited to a branch. People have lesser time to spend on their banking activities and would like to avail the banking services through other channels. In a competitive market where the services offered command market share, banks are constantly vying for customers. Banking has become a process of choice and convenience. By offering different channels even the banks have been successful in diverting their operations from a branch to other channels. The result of which has been a cut in the cost per

transaction at the branch. An average transaction at the branch costs around Rs.100; at an ATM it is about Rs.40, and on the Internet it's around Rs. 20. But unfortunately a very small percentage of the customers out there use the Internet Banking in India. This is due to factors like low PC penetration, and penetration of Internet itself is low. Currently only a few banks (e.g. HDFC, PNB etc. )have shown the initiative for Internet banking and have a strong edge over other banks though a large number of customers still use ATMs. Typically 55 percent, on an average, transactions of these banks are on the ATM, 30 percent branch, 8 percent on telephone and 7 percent Internet. As with any new technology new problems are faced. There exist a number of problems being faced by these banks. One of the first problems is that of customer support. Banks have to create a whole new customer relations department to help customers. Banks have to make sure that the customers receive assistance quickly if they need help. Any major problems or disasters can destroy the banks reputation quickly and easily. By showing the customer that the Internet is reliable they are able to get the customer to trust online banking more and more. Besides these the first major concern is with laws. While Internet banking does not have national or state boundaries, the law does. Companies will have to make sure that they have software in place that can detect when an interstate law is being violated. Security of course is a huge issue with banks. Along with security, encryption, and managerial issues, a bank also has to worry about becoming too cold a distant to the customer. Some feel that banks who offer Internet banking are becoming more and more cold and impersonal with respect to the customer. Though the problems exist yet they aren't as bad as one thinks. With encryption and security technology improving in leaps and also with banks and financial institutions being allowed to use 128-bit code Internet banking is becoming more secure. The future of modern banking is integration, as people will have less time for banking. My survey revealed that the banks that offered E-banking services are fast becoming the choice of the citizens in the urban areas. People want to process more transactions on the Internet. Soon there will be more activity in terms of applications and services on the mobile. Geography will not be an inhibitor any more as everything is executable on the Net. Integration shall become the next real big thing. The customer will want a one-stop shop that will take care of all his needs. For instance people will want to buy their mutual funds, redeem their mutual fund, buy insurance policies, renew policies, buy cinema tickets, railway tickets, and numerous similar transactions through the bank. The ATM will still serve as a cash-dispensing medium, but the Internet and mobile will be very active. The banks that would employ Internet banking would have higher return rates on deposits and would provide higher overall interest rates since they will not have to deal with tellers, branches, etc. And then in the coming times virtual banks and not actual ones will dominate the future banking.

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