

TECHNOLOGICAL INNOVATION IN BANKING SECTOR

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ABSTRACT

The 21st century will pass about broad convergence of computing, communication, information and knowledge. This will completely alter the manner we live, work, and think. The development of high speed networks, together with the falling cost of computing power, is making practicable applications undreamed of in the past. Data, voice, images and video may now be transmitted around the world in micro-seconds. This explosion of technology is changing the banking industry from paper and branch banks to 'digitized and networked banking services. It has already changed the internal accounting and management systems of banks. It is now totally changing the delivery systems banks use to serve their customers. All over the world, banks are still struggling to find a technological solution to meet the challenges of a rapidly-changing environment. It is clear that this new technology is changing the banking industry forever. The various innovations in banking and financial sector are ATM, EFT, RTGS, NEFT, ECS, Debit & Credit cards, retail banking, free advisory services, payments of utility bills, fund transfers, telephone banking, internet banking, mobile banking, selling insurance products, issue of travel cheques and many more value added services. The objective of this paper is to study about technological innovations in banking sector, their significance and their pros and cons in 21st century.

Keywords: Information technology, Banking, ATM, RTGS, NEFT, Mobile Banking, Internet Banking etc.

Introduction:

The banking industry is changing at phenomenal speed after the liberalization and globalization since 1991. The traditional functions of banking are confined to accept deposits and to give loans and advances. Now the target of banking is not just to satisfy but to involve with customers to make them delighted and for the prosperous achievement of this goal, the way is to provide customer an optimum combination of technology and traditional service. The banks are using the information technology to take competitive advantage in banking by providing better quality of services at greater speed which has converted traditional banking into electronic banking uses technology. Today the banking is known as innovative banking.

Banking activities also transform their traditional scope and new concepts like personal banking, retailing, universal banking, internet banking, mobile banking were introduced which were expected to change the way banking would be perceived in the future. Now tap, click and swipe are the new sounds of money. Modern technology is prompt, replacing manuscript with computer files, bank tellers with automated teller machines (ATMs) and file cabinets with server racks. Current banking sector has come up with a lot of initiatives which provides better customer services in different ways by using IT. In the competitive banking world, advancement in customer services is the most constructive tool for the better growth of banks. Bank changes the way to access their banking and other services. Banks are setting up different delivery channels to control operating costs like off-site ATMs, telebanking, internet banking, centralized transaction processing, outsourcing etc.

Objectives of the study:

To know about reforms in banking sector

To know about technological innovation in banking sector

To study the pros and cons of various technology used in banking

Research Methodology:

The paper is a literature overview of different technology used in banking sector in the era of information economy. **The present study is descriptive in nature and is based on the secondary information collected from various websites, magazines, text books and journals. It is a conceptual study.**

Limitation and scope for further research:

This study is based only on secondary data. Further research can be done on the basis of primary data through a questionnaire filled by customers and bank employees to know the depth of the different technology used in banking sector, their authenticity and the significance of these technologies in information economy in the current scenario.

Banking Innovation in India:

The banking industry in India has been through a long journey, which covers the conventional banking practices from the time of Britishers to the reforms period, nationalization to privatization of banks and now numbers of foreign banks in India and use of information technology in banking are increasing. Indian Banking Sector has undergone a huge innovation in the years since Independence. The rate of revolution was particularly high in the 1990s and 2000s, when emphasis being placed on technology and innovation changed the way banking was perceived. Banks start to use information technology to provide better services at faster speed. Information technology has made it convenient for clients to do their banking from geographically diverse area which earlier remain uncovered.

Indian Banking Transformation – The Starting Point:

Indian banks have encountered through four major shifts since independence which can be classified as pre reform (before 1991) and post reform period (after 1991):

Pre-Reform period:

A period of amalgamation of banks up to 1966

A period of significant development in both geographical and functional terms from 1966 to mid- 1980s

A period of merger of branches from mid - 1980s to 1991

Post- Reform period:

Introduction of technology in the Indian banking sector can be outlined back to the Rangarajan Committee report, way back in the 1980s but during 1990s, the banking sector witnessed various liberalization procedures. New private sector and foreign banks emerged - equipped with the latest technology. These banks elected for a different representation of having a single centralized database through a network infrastructure, as a replacement for multiple databases for all their branches. Deregulation has opened up new opportunities for banks to increase revenues by expanding their scope in investment banking, credit cards, insurance, depository services, mortgage financing, securitization, etc. Now, banks have used multi- channels like ATMs, credit cards, debit cards, internet banking, telephone/mobile banking, call centers, etc. The role of banking is redefined from a mere financial liaison to service contributor of various financial services under one roof acting like a financial supermarket.

FORCES FOR CHANGE IN INDIAN BANKING:

With increasing competition among banks, customers are becoming more perceptive and demanding. To meet consumer expectations, banks will have to offer a wide collection of deposit, investment and credit products through different delivery channels including upgraded branches, ATMs, telephone and Internet. The banks like other business organizations are deploying innovative sales techniques and advanced marketing tools to gain superiority and to take competitive advantage. Customer attitude has moved out hand in hand with the development of ATMs, Mobile phone and internet banking along with availability of service right at the customer's doorstep. While banks are emphasizing on strong customer relationship and move towards 'relationship banking,' customers are increasingly moving away from the boundaries of traditional branch banking and seeking the convenience of remote electronic banking. Information technology and the communications networking systems have change the working of banks and financial entities all over the world.

INNOVATIONS IN BANKING SECTOR:

Banking through internet has emerged as a strategic resource for achieving higher competence, control of operations and decrease in cost by replacing paper based and labour concentrated methods with automated processes leading to higher efficiency and profitability. Challenging business environment within the banking system raised more innovation in the fields of product, process and market. The various innovations in banking and financial sector are ATM, EFT, RTGS, NEFT, ECS, Debit & Credit cards, retail banking, free advisory services, payments of utility bills, fund transfers, telephone banking, internet banking, mobile banking, selling insurance products, issue of travel cheques and many more value added services. These are as follows:

ATM:

ATM, earliest electronic banking product, introduced in the mid 1970's. An automated teller machine/ ALL TIME MONEY (ATM) facilitates customers a safe mechanism of performing financial transactions in a public space anywhere and anytime. This plastic card is replacing cheque, personal attendance of the customer, banking hour's restriction and paper based verification. People can withdraw cash, make deposits and transfer funds between accounts 24x7 with full privacy through it. To broad financial services for their captive audience, Banks are using it for product promotion, fund transfer across banks. It is alternative to opening new branches for banks and increase market penetration.

But these facilities come with added problems when huge amount of money is withdrawn by large number of customers in a very short period of time. Banks has to bear set up fee to install ATMs, upfront equipment cost and customer has to pay monthly or annual service fee for support, usage fee either per transaction or on a monthly basis.

Table No. 1

ATM Description in Indian Public and Private Banks

Name of ATM issuer bank	2011		2012		2013		2014		2015	
	On-line	Off-line								
State bank of india	11971	9803	13696	11056	20351	16389	23629	21925	19151	29129
Central bank of india	788	690	1110	940	1916	1515	2817	1741	3355	1746
Punjab national bank	3079	2714	3012	3046	3215	3483	4521	3688	4761	4043
Bank of India	846	799	937	901	1753	1609	3048	3121	3327	4439
Union Bank of India	2062	963	2273	2027	3002	2828	3067	3551	4244	2667
Canara Bank	1557	1107	1608	1670	2469	2074	4924	2675	5243	3909
ICICI Bank	2991	4611	3261	6779	3761	7454	4162	7929	4408	8840
HDFC Bank	3363	3747	4124	6366	4675	6798	4868	6765	5357	6436

Above table shows the growth of ATM in India in different years.

Debit Card :

A debit card is an electronic card allows bank customers access to their account to withdraw cash or pay for goods and services at merchant location directly. This removes the need for bank clients to go to the bank by replace physical cash and cheque. In debit card system customers deposit in advance into the bank and withdraw at the time of purchase. Debit card allows customer to spend only what is in his account. In some cases, the primary account number is assigned exclusively for use on the Internet and there is no physical card.

There are two major types of debit cards. **Online debit cards** and **Offline debit cards**. Debit card allows us to perform our banking online anytime and anywhere. We don't need to find a bank to withdraw funds. It keeps us within budget because we can spend only up to that amount which we have in our account. No monthly interest charges on our spending. Debit cards are preferred by merchants than cheques or credit cards. And swiping a card is much quicker than writing out a cheque.

On the flip side, If our account balance is not adequate to cover the transaction, our card will be denied at the point of purchase and this can be really awkward. We must keep an accurate record of our debit card usage to avoid becoming overspent on our account. Some banks may charge additional fees or penalties for falling below a minimum required balance that result from using a debit card.

Credit Card:

A credit card is a small plastic electronic card made according to ISO 7810 standard specification which allows the cardholder to purchase goods, travel and dine in a hotel without making instant payment. It relieves the customer from the botheration of cash and ensures safety and provides credit without formality, which the cardholder can use for payment to a merchant or as a cash advance. Thus, credit card is a passport to safety, convenience, prestige and credit. Credit cards make it easier to purchase either online or offline without carrying cash, save our time and trouble, revolving credit to save today (for example, one-day sale), when available cash is a week away. Statements assist us to track our expenses and tax computation. We get more security if we pay with a credit card rather than if we pay with a debit card, cash or cheque.

On the other side, high interest rates and annual fees associated with credit cards often outweigh the benefits received. Low introductory rates available only for a limited time. When the teaser rate expires, the interest rate charged on our balance can jump dramatically. Sometimes credit cards can be stolen either physically or our credit card number (over the phone, from a receipt, or from a Web site) and use our card to rack up debts. Credit card increases consumer spending.

Credit cards are like a knife as if we use it in the right manner, it can help us, but if we misuse it, it can hurt us. Credit cards provide the necessary financial assistance in times of need, but if used unnecessarily and foolishly, the same credit card can become a financial nightmare.

Smart Card

A smart card was first produced by Motorola in 1977, is a thin, credit card sized piece of plastic, contains a programmable chip to store the information in its memory that can be refilled by connecting to the bank. Smart cards are receiving renewed attention as a mode of online payment. Consumers can load money into an account on the card by using an automatic teller machine (ATM) or by placing the card in a slot in a specially equipped computer. The embedded chip keeps track of how much money is added to and withdrawn from the account. Smart cards are already quite popular for online sales in some international markets. According to Vince Emery in his book How to Grow Your Business on the Internet, they are eventually expected to combine the features of credit, debit, phone, and other cards in one piece of plastic. Visa Cash cards are examples of smart cards. Smart card can be accessed only using a PIN of customer. Smart cards are secure as they stores information in encrypted format and are less expensive/provide faster processing

Electronic Clearing Service:

The ECS was the first version of "Electronic Payment" in India. It is a means of electronic funds transfer from one bank account to another bank account using the system of clearing house. It is very useful in case of mass transfers from one account to many accounts or vice-versa.

There are two types of ECS (Electronic Clearing Service)

1. ECS – credit
2. ECS- debit.

ECS Credit is used by an institution for affording credit to a large a number of beneficiaries having accounts with bank branches. ECS Credit enables payment of amounts towards distribution of dividend, interest, salary, pension, etc of the user institution.

ECS DEBIT: It is a scheme under which an account holder with a bank can authorize an ECS user to recover an amount at a prescribed frequency by raising a debit in his account.

ECS is useful for customers such as there is no need to make regular visits to bank for submitting physical paper instruments. It eliminates the trouble of standing in long queues for making payment. It facilitates corporate bodies in cash management and avoids chances of fraud.

ELECTRONIC CHEQUES:

Small businesses also permit customers to pay for electronic purchases by accepting personal or business cheques online. Electronic cheques system require the merchant to use special software, electronic cheques might plea to us if we do not currently have a credit card merchant account. Online merchants who accept electronic cheques generally set up a form on a Web page and have their customers enter all the information from their regular cheques. The merchant can submit this information to a bank like a regular cheque. A digital signature is used in place of a handwritten one to verify the identity of the customer. One advantage of electronic cheques is that it provides customers with a familiar method of payment. It provides many services to customers and merchants.

INTERNET BANKING/NET BANKING:

It is a very popular electronic payment method used by customers, who have accounts enabled Internet banking, to transfer money from one bank account to another bank account either in same bank or different bank. Customer logins to the bank's website and registers another bank account. He/she then places a request to transfer certain amount to that account. Customer's bank transfers amount to other account if it is in same bank otherwise transfer request is forwarded to ACH (Automated Clearing House) and amount is deducted from customer's account. Once amount is transferred to other account, customer is notified of the fund transfer by the bank.

Bank offers Internet banking services anywhere as long as there is internet connection and 24 hours a day and 365 days round the year. In a scenario where internet connection is unavailable, customer services are provided round the clock via telephone. At the touch of a button, actual time account balances and information are availed. It is also good for the environment as it cuts down the usage of paper, reduces pollution as people do not have to travel physically and also does not add emissions. A client can monitor his/her spending via a virtual wallet through certain banks and applications and enable payments.

On the other side, we cannot use it, if the bank's server is down and internet connection is not available. It lacks personal touch. Accounts are prone to hacking attacks, phishing, malware and illegal activities. Banks with complicated sites can be cumbersome to navigate and may require one to read through tutorials to navigate them.

NEFT:

National Electronic Funds Transfer (NEFT) is a nation-wide payment mechanism facilitating persons, firms and business to transmit funds from one bank branch to any person, firm or business having an account with another bank branch in the country participating in the system electronically. Persons who do not have an account in the bank can also transfer cash (Max. Rs. 50,000/-) at the NEFT- enabled branches using NEFT. The NEFT scheme also facilitates one-way cross-border transfer of funds from India to Nepal. This is known as the Indo-Nepal Remittance Facility Scheme.

There is no limit on the amount to be transferred either minimum or maximum (except cash based transaction restricted to Rs. 50,000/and remittance to Nepal). There is no restriction of any geographical area within the country. NEFT system used IFSC to recognize the destination.

NEFT facilitates in fund transfer without transmission of physical cheque or demand draft. So beneficiary need not visit his / her bank to submit the paper documents and to worried about loss / theft of physical instruments. SMS or email is sent for credit confirmation of the remittances. Remitter can initiate the remittances from his home / place of work using the internet banking also. Thus, this is a fastest, secure, safe, simple, and cost effective way to transfer funds.

RTGS:

Real Time Gross Settlement system(RTGS), started in India since March 2004, through which electronics information can be given by banks to transmit funds from their account to the account of another bank on a "real time" and "gross settlement" basis. The RTGS system is operated by the RBI and facilitates efficient and faster funds transfer among banks. As the name suggests, funds transfer between banks takes place on a 'Real Time' basis. Therefore, money can reach the beneficiary immediately and the beneficiary's bank has the duty to credit the beneficiary's account within two hours. Gross settlement means the transactions is completed on one to one basis without bunching with other transactions. Basically, this is a structure for large value interbank funds transfer.

RTGS facilitates for large value payments system, processing both customer and interbank transactions of `2, 00,000 and above. Both RTGS and NEFT consistently posted double digit growth in terms of the volume of transactions routed through these systems.

Table No. 2
 Occurrence of transactions through Banking Technology in India
 (No. of transaction)

Year	RTGS	NEFT	ECS		Mobile banking
			ECS CREDIT	ECS DEBIT	
2009	3275146	3173362	5826752	12651782	-
2010	3899349	13457326	7716786	13494849	-
2011	5097667	20613975	7077334	14273119	2670488
2012	6032600	35537622	6887980	14998111	5221007
2013	7017796	60358140	10208447	16150771	8892790
2014	8185900	83485916	10100650	19352526	16783505

Above table shows growth of various banking technology such as RTGS, NEFT, ECS and Mobile Banking from 2009 to 2015.

E-Cash:

Concept of electronic cash is developed by Dr. David Chaum. It is widely used for macro payments on the internet at any shop accepting e-Cash without giving credit card details to the shopkeeper as a substitute for government-issued physical currency. Customers can transfer money from savings and

check accounts into an online cash account, from which they withdraw to make purchases over the Internet by using software.

For the most part, electronic cash transactions are more efficient and less costly than processing credit card transactions. Traditional money exchange systems are expensive while costs that users of electronic cash must incur are nearly zero. Chances of theft of electronic cash are nil.

On the flip side, Electronic cash provides no audit trail, difficult to trace and another problem arises-money laundering. Money laundering is a technique used by criminals to convert money that they have obtained illegally into cash by purchasing goods or services, without identified as the proceeds of an illegal activity. The goods are then sold for physical cash on the open market.

Core banking solution:

CBS is a centralized platform, which creates environment where the bank's operations can be controlled, and run from a centralized focus. This creates a centralized customer list, which makes anywhere, anytime, anyway banking possible. Immediate advantages of CBS are faster and efficient customer service, offering multiple delivery channels, like ATMs, Cards, internet Banking, mobile/Telephone Banking, Call centers, etc., reducing the operational costs, through manpower saving and space saving.

Mobile Banking:

Mobile banking is a technology used for performing balance checks, accounts transaction, fund transfer and payment via a mobile phone. Mobile banking is the hottest area in banking and replaces the debit/credit card system in future. Table 2 shows the tremendous growth of mobile banking in India in past year, as it cuts down the cost to provide services to customer.

Conclusion:

Today mobility and customer convenience are the primary factor of growth and banks are continuously exploring new technology with terms such as mobile solutions and cloud computing. To meet challenges such as increasing competition, customer expectation, banks will have to offer a wide collection of deposit, investment and credit products through different delivery channels including upgraded branches, ATMs, telephone and Internet. Now, the use of IT is critical in this information economy by banks. So, Banks should opt innovative ways to achieve success in 21st century.

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