Impact of Information Technology (IT) Applications on Banking Industry

Jnana Ranjan Dhir
HSBC Software Development(India)
Senior Consultan Specialist
Pune, India
Email: Jnanadhir1 [AT] gmail.com

Rasmi Ranjan Patra
Computer Science Application, C.P.G.S,
Orissa University of Agriculture and technology,
Odisha, India

Abstract—**Information technology (IT), today, affecting the daily activity of individuals and organizations. Information is an input for every activity of organizations, without which organizations cannot function efficiently. IT has become a most important element in economic growth and a spine for knowledge-based economies with respect to quality and productivity of offered services and operations. Therefore, it is a challenge for developing countries to take advantage of usage of IT in various sectors. Organizations like the banking sector have benefited significantly from e-banking, which is one among the IT applications for strengthening the competitiveness. A combination of regulatory and competitive reasons has led to increasing importance of total banking automation in the Indian Banking Industry. Benefits of information technology in banking are: operational efficiency, productivity and profitability, offering the superior quality customer services, multi-channel, real-time transaction processing, ability to better cross selling of products and services, improved management information system, management and accountability, supports supply chain management activities by automating the tracking of inventory and information among business processes and across companies.. In creating a viable and efficient banking system, which can respond adequately to the needs of growing economy, technology has a key role to play. The technological challenge is to identify suitable areas of automation, selecting appropriate software and priorities the implementation on suitable and cost effective hardware so that in ultimate analysis, gains outweigh the cost. The paper presents: to know the current trend in the application of IT in the banking industries in India and gives an insight into how quality banking has been enhanced via IT. And to know the deployment of IT facilities in the Indian Banking industry has brought about fundamental changes in the content and quality of banking business in the country.**

Keywords-component; Internet Banking, Information technology, E Banking

I. INTRODUCTION

Information Technology enables sophisticated product development, better market infrastructure, techniques to manage risk and helps the financial intermediaries to reach geographical distant and diversified market. At the time of manual transactions, an account holder had to wait for hours at the bank counters for getting a draft or for withdrawing his own money. Now, for banking transactions customers are no longer prepared to wait for information or services. They want their banking information and services at their fingertips by their chosen delivery channel. This creates a problem for many banks and financial institutions. Because if they are unable to provide a fingertip service or IT based service to their customer, it affects their business. So as per the increasing need of IT, they have now started to provide a wide variety of delivery channels like ATM, Phone Banking, Internet Banking, Mobile Banking etc. Today, customer has a choice to use tailor made products for a quick service. Many banks in India have introduced IT for several reasons: - a) Adoption of information technology in financial institutions and IT based new services offered by them/competitors b) Rising competition in banking industry c) Globalizations in banking d) To meet the growing demand of customers for mobility, speed, efficiency and economy through various technology based services e) A technological revolution in the Indian economy Today IT has dramatically changed the functioning of the banks. They have moved from a distributed/disbursed to a centralized environment by introducing multiple delivery channels like: ATM, Internet, and Mobile etc. From the IT perspective, the banking industry can be classified into three categories a) Banks where all the processes are automated. b) Banks that are in the process of implementing core banking software and setting up their networking infrastructure. c) Banks that are in the process of identifying the core solutions.

II. WHY TECHNOLOGY IN BANK

Indian banking sector is governed and regulated by Reserve Bank of India (RBI). Adoption of technology started in 1984, when RBI circulated guidelines for computerization of Banks. Technology in Banks helped to transform financial services

industry in the net-worked world, customer centric, Provide services / products across a range of channels, to be futuristic and have "time" value in all its dealings with customer. Increased operational efficiency, profitability &productivity, Superior Customer Service, Multi-channel, real-time transaction processing, Better Cross-Selling ability, Improved management / accountability, Efficient NPA and Risk Management, Minimal transaction costs, Improved financial analyses capabilities

III. COMMUNICATION NETWORK USED IN BANKS

MICR (Magnetic Ink Character Recognition) Clearing: is used to speed up the cheque clearing process. Cheque leaves standardized size (8 X 3 2/3") are pre-printed with the bank-branch code and account type in MICR strip, while the amount is read manually and fed into the system using the encoders for funds settlements

BANKNET: Setup by RBI in 1991 to facilitate transfer of inter-bank/ inter-branch messages within India by Public Sector banks who are members of this network

INFINET (Indian Financial Network): Setup by RBI in 1999. It is a satellite based WAN using VSAT (Very Small Aperture Terminal) technology which is widely used in performing the applications like E-mail, Electronic Clearing Service - Credit and Debit, Electronic Funds Transfer.

SWIFT: The Society for Worldwide Interbank Financial Telecommunication (SWIFT) provides a network that enables financial institutions worldwide to send and receive information about financial transactions in a secure, standardized and reliable environment. Swift also sells software and services to financial institutions, much of it for use on the SWIFTNet Network, and ISO 9362. Business Identifier Codes (BICs) are popularly known as "SWIFT codes".

IV. MODE OF PAYMENT

National Electronics Funds Transfer (NEFT) and Real Time Gross Settlement (RTGS) are two convenient mode of money transfer between banks in India.

National Electronics Funds Transfer (NEFT): was introduced in 2005. This is an online system transferring funds between financial Institutions. NEFT functions on a deferred net settlement basis where transactions are completed in batch at specified time. NEFT is used for transaction between 2 lacs. NEFT is done on a net basis where the bank clubs transactions together and only the net amount is transferred. This settlement usually takes place 7 times a day on weekdays and 3 times on Saturdays. NEFT takes place within the same day if it is within the cut off time and the next working day if it is beyond the cut-off time.

Real Time Gross Settlement (RTGS): was introduced in India in 2004. It enables transfer money in real time i.e. there will be no waiting period. Under normal circumstances the transactions are settled as soon as they are processed by remitting the bank. RTGS is for amount equal or greater than Rs. 2 lacs. In RTGS the beneficiary bank credits the beneficiary's account in a span of two hours after receiving the funds transfer message. RTGS transactions are processed throughout the working hours of the system.

V. BENEFITS OF INFORMATION TECHNOLOGY IN BANKING SECTOR

Apart from doing traditional business like collecting the deposits from the public and lending the money to individuals or organizations, banks now days provide services to the all types of customers like individual account holder and company accounts and also to the non customers. The range of services offered differs from bank to bank depending mainly on the type and size of the bank.

Information Technology enables new product development, better market infrastructure, implementation of right techniques for control of risks and helps banks to extend their markets geographically. Internet has emerged as an important medium for delivery of banking products and services.

A. Benefit to the Customer

Mobile Banking: With increase in usage of mobile phones and cellular services, several banks have introduced mobile banking which allows customers to perform banking transactions using their mobile phones through Internet. Mobile banking is very helpful to people who travel frequently and enables them to keep track of their banking transaction. Mobile banking has until recently most often been performed via SMS or the mobile web. Apple's initial success with iPhone and the rapid growth of phones based on Google's Android (operating system) have led to increasing use of special client programs, called apps, downloaded to the mobile device. With that said advancements in web technologies such as HTML5, CSS3 and JavaScript have seen more banks launching mobile web based services to complement native applications. A recent study by Mapa Research suggests that over a third of banks have mobile device detection upon visiting the banks' main website. A number of things can happen on mobile detection such as redirecting to an app store, redirection to a mobile banking specific website or providing a menu of mobile banking options for the user to choose from. Mobile banking services are provided through a convention of connection to these services. Access to the database is made through a password and a customer code. Customers can check their balance and make adjustments between accounts. The potential for providing mobile banking services may be far greater than services thru typical desktop access, as there are several times more mobile phone users than online PC users. There are two main types of technology available for

use in mobile banking: WAP (Wireless Application Protocol) and WIG (Wireless Internet Gateway).The first one is an application environment and set of communication protocols for wireless devices build to enable manufacturer, vendor and platform independent access to the internet and advanced telephony services. The other one (WIG) is a SMS-based service in which a menu of banking services options is downloaded from the bank to the phone. This enables the user to browse to all bank services options and thru their accounts and to conduct specific tasks

SMS 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 messaging. Most SMS banking solutions are add-on products and work with the bank's existing host systems deployed in its computer and communications environment. As most banks have multiple backend hosts, the more advanced SMS banking systems are built to be able to work in a multi-host banking environment; and to have open interfaces which allow for messaging between existing banking host systems using industry or de facto standards. Well developed and mature SMS banking software solutions normally provide a robust control environment and a flexible and scalable operating environment. These solutions are able to connect seamlessly to multiple SMSC operators in the country of operation. Depending on the volume of messages that are require to be pushed, means to connect to the SMSC could be different, such as using simple modems or connecting over leased line using low level communication protocols (like SMPP, UCP etc.) Advanced SMS banking solutions also cater to providing failover mechanisms and least-cost routing options.

Video Banking: Video banking is a term used for performing banking transactions or professional banking consultations via a remote video connection. Video banking can be performed via purpose built banking transaction machines (similar to an Automated teller machine), or via a videoconference enabled bank branch. Although termed video banking, the video connection is always accompanied by an audio link which ensures the customer and bank representative can communicate clearly with one another. The communication link for that video and audio typically requires a high-speed data connection for applications where the tellers are not in the same physical location. Various technologies are employed by the vendors of video banking, but recent advances in audio and video compression make the use of these technologies much more affordable. Purpose-built transaction equipment is currently available, but in the future these video banking systems will likely leverage existing automated teller machines which will be modified to enable the audio and video communication.

Phone Banking: Customers can now dial up the bank's designed telephone number and the by dialing his ID number will be able to get connectivity to bank's designated computer. The software provided in the machine interactive with the computer asking him to dial the code number of service required by him and suitably answers him. By using Automatic voice recorder (AVR) for simple queries and transactions and manned phone terminals for complicated queries and transactions, the customer can actually do entire non-cash relating banking on telephone: Anywhere, Anytime.

Tele-banking: Tele banking is another innovation, which provided the facility of 24 hour banking to the customer. Tele-banking is based on the voice processing facility available on bank computers. The caller usually a customer calls the bank anytime and can enquire balance in his account or other transaction history. In this system, the computers at bank are connected to a telephone link with the help of a modem. Voice processing facility provided in the software. This software identifies the voice of caller and provides him suitable reply. Some banks also use telephonic answering machine but this is limited to some brief functions. This is only telephone answering system and now Tele-banking. Tele banking is becoming popular since queries at ATM's are now becoming too long. To access telephone banking, the customer would call the special phone number set up by the financial institution. The service can be provided using an automated system, using speech recognition and DTMF technology or by live customer service representatives. The types of financial transactions which a customer may transact through telephone banking include obtaining account balances and list of latest transactions, electronic bill payments, and funds transfers between a customer's or another's accounts. Cash withdrawals and deposits require the customer to visit an automated teller machine or bank branch.

ATM (Automated Teller Machine): It provides the customers with facility of withdrawing the money 24 hours a day, 7days a week through their Debit/Credit cards. Most ATMs are connected to interbank networks, allowing people to withdraw and deposit money from machines not belonging to the bank where they have their accounts or in the countries where their accounts are held (enabling cash withdrawals in local currency). Some examples of interbank networks include PLUS, Cirrus, AFFN, Interac, Interswitch, STAR, LINK, MegaLink, NYCE, PULSE, and BancNet. ATMs typically connect directly to their host or ATM Controller on either ADSL or dial-up modem over a telephone line or directly on a leased line. Leased lines are preferable to plain old telephone service (POTS) lines because they require less time to establish a connection. Less-trafficked machines will usually rely on a dial-up modem on a POTS line rather than using a leased line, since a leased line may be comparatively more expensive to operate compared to a POTS line. That dilemma may be solved as high-speed Internet VPN connections become more ubiquitous. Common lower-level layer communication protocols used by ATMs to communicate back to the bank include SNA over SDLC, TC500 over Async,

X.25, and TCP/IP over Ethernet. In addition to methods employed for transaction security and secrecy, all communications traffic between the ATM and the Transaction Processor may also be encrypted using methods such as SSL.

Electronic Clearing Service (ECS): ECS is an electronic mode of fund transfer mechanism introduced by RBI (in 1994) which helped customer to choose their payment method by monthly/quarterly/half-yearly/yearly. The Customer's bank account would be debited through the new payment mechanism right on the due date. ECS is used for bulk payments towards telephone/ electricity/ water dues/ tax collection/ loan repayment installment, periodic investment in mutual funds, insurance premium etc. The ECS users intending to effect payment submits their data which gets approved by the clearing house. The clearing house debit the ECS users thru the account of the sponsored bank on the scheduled date and credit the accounts of the recipient bank, for affording on word credit to the ultimate beneficiaries. ECS uses BANKNET and INFINET network to facilitate the payment.

B. Benfits to the Bank

Operational excellence: The use of IT provides a) efficiency to doing things right in the least amount of time, with the fewest number of errors b) comfort to access to the bank 24 hours a days, 7 days a week, without depending on the bank's schedule c) low costs in order to reduce the number of clients who go to the bank desks, there are fee reductions (10-50% of the ordinary fees) for the electronic payments d) time saving and reduced expenses (no more transportation to and from the bank building) e) safety of making transactions take place in the best security conditions as customers use a username, a password, and an encrypted channel and accessibility thru online connection with the bank from any Internet connected computer and simple & ergonomic menu leading the client directly to the operation he/she wants to perform.

Major Business Initiatives: The use of technology to support initiatives such as customer relationship management, enterprises resources planning, sales for automation, and supply change management.

Supply change management (SCM): An IT system that supports supply chain management activities by automating the tracking of inventory and information among business processes and across companies.

Customer relationship management (CRM): CRM consists of the processes a company uses to track and organize its contacts with its current and prospective customers. CRM software is used to support these processes, information about customers and customer interactions can be entered, stored and accessed by employees in different company departments.

Sales force automation (SFA) system: Automatically tracks all the steps in the sales process. CRM helps a bank with the a) Find customers b) Get to know them c) Communicate with them d) Ensure they get what they want (not what the bank offers) e) Retain them regardless of profitability f) Make them profitable through cross-sell and up-sell g) Covert them into influencers h) Strive continuously to increase their lifetime value for the bank.

Business intelligence (BI): The knowledge about your customers, your competitors, your business partners, your competitive environment, and your own internal operations – that gives you the ability to make effective, important, and often strategic business decisions. Business Intelligence tools can be used by banks for historical analysis, performance budgeting, business performance analytics, employee performance measurement, executive dashboards, marketing and sales automation, product innovation, customer profitability, regulatory compliance and risk management.

C. Benfits to the Employees

Modernize communications with customers: Interacting with customers efficiently and knowledgeably helps keep them satisfied—and few things are as important to your bottom line as satisfied customers. Linking an IP communications system to a customer relationship management (CRM) solution is one way to enhance customer communications. When a customer calls, a pop-up window of the customer contact record appears on an employee's IP phone screen, computer screen, or both. Before the second ring, the employee answering the call has access to information about the customer calling, such as orders pending and recent returns.

Easy to collaborate: Effective, interactive collaboration between employees, partners, suppliers, and customers is a sure-fire way to boost efficiency while also reducing costs. Integrated voice, video, and data and wireless provides the kind of interactive calendaring, videoconferencing, IP communications, and other technologies your business needs to foster seamless, easy collaboration.

Secure and consistent access to information: Accurate computing of cumbersome and time-consuming jobs such as balancing and interest calculations on due dates. Automatic printing of covering schedules, deposit receipts, pass book / pass sheet (transaction documents), freeing the staff from performing these time consuming jobs, and enabling them to give more attention to the needs of the customer. Signature retrieval facility, assisting in verification of transactions, sitting at their own terminal. Avoidance of duplication of entries due to existence of single-point data entry.

VI. CHALLANGES

Major challenges for implementing IT in banking industries are: a) Infrastructural barriers - the banks face difficulties to

expand its branch networks in remote areas due to lack of facilities. b) Knowledge barriers - the banks have had to face corners the inability of banks to retain the trained and talented personnel, especially those with a good knowledge. c) Legal and security issues - Increasing used of IT in banks has also brought up security concerns. The passing of IT Act has come as a boon to the banking sector and banks should now ensure to abide strictly by its covenants. An effort should be also made to cover e-business in the country's consumer's laws. d) Social and cultural barrier- India being with vast geographical and multi linguistic & multi-cultural nation, it is also a challenge for the banks. e) Economic factors also another hurdle for implanting and development of IT in banking sector.

VII. CONCLUSION

Information Technology has undoubtedly changes the overall system of banking. With the use of IT the banking has been redefined and re-engineered and it is persuaded that the future of banking will offer more refined services to customers with the continuous high-quality product and process innovations. Thus there is a paradigm shift from seller's market to buyer's market. So banks also change their approach from "Conventional Banking to Convenience Banking" and "Mass banking to Class Banking". Internet banking is ever more becoming a "need to have" than a "nice to have" service. So banks are now more concentrate on providing value added services to customers. But IT can be fully useful only if they enable to meet the challenges in the present environment. In India it can be successful only if it is properly implemented in rural areas also. There is also need to maintain privacy and confidentiality of data. Many nations deem privacy to be a subject of human right and consider it to be the responsibility of those who concerned with computer data processing for ensuring that the computer use does not revolve to the stage where different data about people can be collected, integrated and retrieved quickly. Another important responsibility is to ensure the data is used only for the purpose intended. For this, there is a need to implement IT and other Cyber laws properly. This will ensure the developmental role of IT in the banking industry.

REFERENCES

[1] How technology is changing Indian banking sector - http://timesofindia.indiatimes.com/tech/it-services/How-technology-is-changing-Indian-banking-sector/articleshow/18225529.cms

[2] Software- http://www.informationweek.in/informationweek/perspective/296818/technology-trends-influencing-financial-services-sector

[3] http://articles.economictimes.indiatimes.com/keyword/banking-technology

[4] Dr Mishra A. K., "Internet Banking in India".

[5] A Information Technology for Management, By Ch Seetha Ram

[6] Modern Banking Technology edited by Dr. Firdos T. Shroff

[7] Banking Sector Reforms in India and Performance Evaluation of Commercial Banks By Debaprosanna Nandy

AUTHORS PROFILE

Jnana Ranjan Dhir received Master in Computer application (MCA) from KIIT, BBSR, Odisha, India in 2002. He is having a total of 12+ years of experience in IT industry out of which 9+ experience is working with Information Technology in Banking sector. He is currently working with HSBC S/W Development (India).

Rasmi Ranjan Patra received Master In Computer Application With 1st Class With distinction from O.U.A.T , Odisha, India in 2001, M.Tech in Computer Science and Technology from C.E.T , Bhubaneswar ,India in 2010 and Ph.D Degree in 2013 from Utkal University, India .He is working as Assistant professor in Department of Computer Science and Application under Orissa University of Agriculture and Technology(O.U.A.T).He has Published many papers at national /international Journals and Conferences in the areas of Sensor Network, Soft Computing, Cloud computing and Big data. Dr.Patra has authorized one book in Computer Science area.