ADOPTION OF TECHNOLOGY IN BANKS – ISSUES AND CHALLENGES

Name of First Author: MRS T.R.SRILATHA, Name of Second Author: Prof. A. SUDHAKAR
Designation of First Author: Research Scholar (PP COM 0088), Ph.D Programme in Commerce
Designation of Second Author: Dean, Faculty of Commerce
Name of the Organization of First Author: Rayalaseema University
Name of the Organization of Second Author: Dr. B. R. Ambedkar Open University, Hyderabad, Telangana

ABSTRACT: India has made a rapid pace in adoption of technology, especially in financial sector. Technology has brought a complete change in the functioning of banks and delivery of banking services. There has been a landmark change in the banking landscape – from brick and mortar banking to click and mortar banking. Banking is no longer restricted to the traditional business model. Today most of the transactions can be done from home and customer need not visit the bank branch for anything. Delivery channels have immensely increased and the choice offered to the customers to conduct banking transactions with ease and convenience. Various retail payments and settlement system have enabled faster means of moving the money to settle funds among banks and customers, facilitating turnover of commercial and financial transactions. This Research paper discusses the issues and challenges in Adoption of Technology in the Banking Sector. The research is based on secondary data of various sources of information technology related to banking and information technology from websites and various journals and articles. This study touched all aspects relating to issues and challenges faced by the banks in providing IT services to the stakeholders. This paper analyses the difficulties in the adoption of technology in banks in India.

Key Words: E-Banking, Information Technology, Delivery channels, Financial Inclusion, Sustainable banking.

INTRODUCTION

Technology adoption in any service sector and financial institutions is a mixed blessing. Adoption of technology is bringing several benefits to banking. Such technology adoption is made possible by the work carried out by several individuals and institution across the globe. There has been advancement in computer, communication and other relevant technology. On the other, bankers and technology companies are working together to ensure that newer technologies are being adopted for better banking. Though technology based banking has provided comfort, convenience to the customers and cost cutting to the banks, it also created several problems in its implementation.

REVIEW OF LITERATURE:

Following are the most essential studies and reviews related to this topic.

[1]**Rangarajan (1991)** mentioned the role of information systems and infrastructural new trends in banking sector. The committee stressed the issue of development in banking infra services which helps to mobilize the services and resources through various ways.

[2]**S.B.Verma et al (2007)** studied the relationship between technology and banking and also found challenges ahead of the banking industry. All are using ATM's and electronic mode to do banking transactions. So now a day it is very essential for the banks to adopt the new factors and use those to achieve their objective.

[3]**R.K.Mittal et al (2008)** described the essentials of the banking and technology and how new trends are performing a major role to the growth of banks. Providing the new services and launching new banking products in the market is also a major elements in information technology now a days. All efforts would take for better utilisation and trustworthiness of the stakeholders of banks.

[4]**Sreelatha. T, CH.ChandraShekar (2012)** identified that information technology promises to change the pace of banking in the next few years. Mobile banking and internet banking are going to be indoor in the banking sector in future. Even though IT systems are complex and sophisticated but they are ' energy guzzlers'.

[5]**Chitra (2010)** stated that penetration of information technology in rural areas and outsourcing of information technology are major concerns of information technology in banking operations. Further, there is motivation to customers for increased use of information technology while transacting with banks. There is more need for strategic thinking by smaller banks while investing in information technology.

OBJECTIVES

1. To study the relationship between banking and information technology sector.
2. To analyse the issues and challenges faced by the banks in adoption of technology.

METHODOLOGY

The study is based on secondary data. The study considered data collected from the Reserve Bank of India circulars, RBI bulletin, business dailies such as The Economic Times, Financial Express, Business Standard and various other journals, magazines and websites which constitute the secondary sources of data.

TECHNOLOGY AND BANKING SERVICES IN INDIA

The advent of technology and its adoption into the financial sector has enabled bankers to think beyond banking, and at the same time, the same technology by facilitating complex financial products has indirectly contributed to the financial crisis.

The computing and communicating technology today has made financial transactions across space possible instantaneously and provided the where withal to record and account for innumerable transactions accurately.

The speed and reliability of information technology has supported creation of nationwide financial services, including ATM, electronic check and credit card processing, transfer of funds, Online account openings, Mobile Banking, Online application for loans, Service like Insurance and Investment services are also available on Technology platform.

With the development of technology, the financial sector has become more efficient. Financial sector plays a critical role in economic development. An efficient financial sector enables the individuals to smoothen their consumption through life cycle and deal with uncertainties. The advancement in information and communication technology in financial sector, in which we have made use of technology has contributed to social utility and made financial sector more strong and healthy.

Framing the new strategy for special banking activities using information technology for providing better services to all the stakeholders is the main goal for all the banks. Adoption and up gradation is essential key to makeover the banking system for today's financial market.

ADVANTAGES OF ADOPTING INFORMATION TECHNOLOGY:

For providing good and satisfactory services to customers bank uses the strategies of technology. Advantages to banks through adopting IT in banks.

- Using IT services in banking sector minimize the cost of handling, so cost reduction is the main benefit from IT to banks.
- Technology enabled the banks to move from a concept of 'Branch Customer' to 'Bank Customer'. Nonstop banking from anywhere and anytime banking provide added comfort and convenience to the present day tech-savvy customers.
- New products and services other than banking launched with the help of technology.
- Presently data warehousing becomes a very useful tool in the hands of management for decision making. Data warehousing enables the banks to pool enormous amount of data at one place and 'slice and dice' the data for the purpose of analysis. This enables to know the demographic profile of customers, potential customers and the most profitable business lines are all identified and appropriate direction to the business strategies decided.
- With the help of technology banking industry is able to provide banking services in unbanked areas. Technology plays a major role in financial inclusion, a sustainable banking theme very relevant to a country like India that has a large unbanked population.

CHALLENGES FACED IN BANKING TECHNOLOGIES:

With the advent of technology new challenges are being faced by banks. These are the major challenges faced by the bank in adopting the technology.

1. Integration of data:
   India is one of the largest population country in the world and many are connected with the banking sector. Data of stakeholders is scattered, therefore compilation of this data in a systematic manner is very essential. IT should help banks not only to deliver robust and reliable services to their customers at lower cost, but also generate and manage information effectively. Information comprises data collected based on principles of integrity, reliability and accuracy. Banks are collecting humungous quantities and warehousing volumes of data relating to customers and transaction. The information is subjected to meaningful analysis, usage and creation of a data base with an objective to meet not only the diversified internal and external MIS requirements but also using this information to increase the volume of profitable business using unique techniques of customer relationship management (CRM).
2. Security risk:
   The problem related to the security has become one of the major concerns for bank. With the increasing users and new services in banking – productivity, efficiency and quality is essential to survive in this competition. A large group of customers refuse to opt for e-banking facilities due to uncertainty and security concerns. Trust is the biggest hurdle to online banking for most of the customers. They have a perception that online banking is risky due to which frauds can take place. So it's a big challenge for marketers and to make consumers satisfied regarding their security issues.

Table 1
Number and amount of fraud cases in banking sector
'Amount in Crore

Year	No. of Cases	Total Amount
2009-10	24,791	2,037.81
2010-11	19,827	3,832.08
2011-12	14,735	4,491.54
2012-13	13,293	8,646.00
Total frauds reported as on 31st March 2013	1,69,190	29,910.12

Data Pertains to the period from 31stMarch2010 to 31st March2013.
Source: K.C.Chakrobarty (2013)

Table 2
Bank Group Wise Fraud in Crore

	No. of Cases	% to Total cases	Amount involved	% to Total Amount
Nationalised Banks(including SBI Group)	29,653	17.53%	24828.00	83.01%
Old sector private Banks	2,271	1.34%	1707.71	5.71%
New Private Sector Banks	91,060	53.82%	2140.48	7.16%
Foreign Banks	46,206	27.31%	1233.92	4.12%
Total	1,69,190	100	29910.12	100

Table 3
Bank Group wise fraud cases reported
(As on 31st March 2013)

Amt involved	< 1 Lakh		>1 lakh up to 1 crore		>1 crore		Total fraud cases	
Bank Group	No of cases	Total Amt	No of cases	Total Amt	No of cases	Total Amt	No of cases	Total Amt
Nationalised Banks(including SBI Group)	7622	31.97	19753	2847.11	2278	21948.93	29653	24828.01
Old sector private Banks	622	2.38	1463	225.09	186	1480.24	2271	1707.71
New Private Sector Banks	83850	112.36	6984	510.18	226	1517.93	91060	2140.47
Foreign Banks	41791	81.60.	4339	212.72	76	939.76	46206	1,233.92
Total	1,33,885	228.31	32,539	3,795.10	2,766	25,886.71	16,9190	29910.12

Source: K.C.Chakrobarty (2013)

It was observed that while the number of fraud cases has shown a decreasing trend from 24,791 in 2009-10 to 13,293 cases in 2012-13 i.e a decline of 46.37%, the amount involved has increased substantially from 2,037.81 crore to 8,646 crore i.e an increase of 324.27%. around 80% of all fraud cases involved amounts less than 1 lakh while on aggregated basis, the amount involved in such cases was only 1% of the total amount involved.

Further , a bank group wise analysis of frauds reveals that while private sector and the foreign bank group accounted a majority of frauds by 82.5%(No of Cases), the public sector banks accounted for nearly 83% of total amount involved in all reported frauds.

3. Cyber Crime:

Cyber crime is a big challenge in financial system. There is an increasing trend in incidents pertaining to theft of personal information and abuse of ATM's. Distributed Denial of Service(DDOS) in the emerging banking scenario are mail spoofing, web spoofing, attacking bank servers, media tapping, phishing/vishing and so on.

Several security measures to be adopted for their documents, information system and customer deliverable instruments. It is also necessary that customer confidential information and other data/information available with banks is secured adequately to ensure that fraudsters do not access it to perpetrate fraudulent transaction. Appropriate verification procedure should also be incorporated at all channels such as phone banking, ATM, branches and internet to ensure that only genuine transactions are put through. All security measures should be under continuous review for further strengthening. A need for comprehensive Information System Security policy has to be put in place by the bank for safeguarding the sensitive information of customers.

Securities Incidents handled by Indian Computer Emergency Response Team (CERT-In)

Table- 4
Summary of various types of Security Incidents handled –Year-wise

Security Incidents	2014		2015		2016	
	No	%	No	%	No	%
Phishing	1122	3	534	1	757	2
Network/Scanning/Probing	3317	7	3673	7	416	1
Virus/Malicious Code	4307	10	9830	20	13371	27
Website Defacements	25037	53	26244	53	31664	63
Website Intrusion & Malware Propagation	7286	16	961	2	1483	3
Others	3610	8	8213	17	2671	5
Total	44679	100	49455	100	50362	100

Data Pertains to the period from 31stMarch2014 to 31st March2016
Source: CERT-In (Annual Report)

As India is trying to implement digital means and technology in the banking sector to keep pace with it's rapidly bludgeoning economy. The country has witnessed a massive surge in cyber crime partly due to the gap in the implementation of security measures and imparting adequate training to staff and partly due to easy availability of propagation of malware in the country. This coupled with the vague and inept laws related to cyber crime, India has witnessed a massive surge in cyber crime incidents from 23 in 2004 to 50362 in 2016. As per government's cyber security arm, Computer Emergency response team – India (CERT-In) 50,362, cyber security incidents in addition 57,262 spam incidents were reported.

4. Customer awareness:
   Consumer awareness is a major challenge. Bank customers must understand the pros and cons of various products. Banks must educate the consumers about various products. Later, consumers would move towards use of technological products, which in turn will be a positive impact on bank performance. The entire institution of banking is built on consumer trust. It helps in retaining the existing customers and attracts new customers. It will automatically improve the banking services and development of banks. The customer dispute resolution has to be given a greater attention in the promotion of electronic payment products.
5. Delivery challenges:
   Consumer preferences and perceptions are the major challenge in delivering services to the customers. The 24x7 electronic banking through alternate channels has put a need for continuous uninterrupted and reliable services in banks. The initiative towards inclusive banking would see customer base of banks expanding at a faster pace. Shifting cash transactions to non cash modes and the efforts of the government to transfer all social benefits electronically to the citizens, the volume of transactions in the electronic payment systems would grow. Thus, these developments are likely to challenge the scalability and adaptability of CBS in banks not only in terms of transactions handling but also in terms of adding new products, new processes and new applications.

Table -5
Alternative Banking Channels

S.No	Traditional Service	Alternative Means	Medium	Services Available
1.	Brick-Mortar services	Automated Branches	PC and LAN	Instant deposit and withdraw money, getting statement, DD, calculation of Interest etc.
2.	Branch Banking	Core Banking	PC and Internet	Instant Deposit and withdraw money, getting statement, cheque clearance and depositing, stop payment etc.
3.	Manual Note Counting	Note Counting Machine	Electronic device	Instant Notes and bundle of notes counting
4.	Formal Cheque	MICR Cheque	MICR technology	Instant Cheque clearance
5.	DD/MT/TT	EFT	Internet and core banking solution(CBS)	Instant fund transfer from one branch any branch under CBS
6.	On counter Cash withdraw	Debit card	ATM	Withdraw money, balance enquiry, Account Statement,Mobile recharge, Make Donation, Card to card transfer, utility bill payments.
7.	On counter Cash withdraw	Debit card	Point of Sale(POS)	Mobile recharge, purchasing, utility bill payment and withdraw money.
8.	Letter of Credit	E-Money	Credit Card	Purchasing and payments of utility bill payment.
9.	Branch Banking	Internet Banking	PC and Internet	Balance enquiry, account statement, stop payment order, EFT, RTGS,purchasing, utility bill payment etc.
10.	Branch Banking	Mobile banking	Mobile phone, SMS, 3G	Balance enquiry, account statement, stop payment order, EFT, purchasing, utility bill payment etc

Source: Miranda et.al, 2006(edited by Author)

Alternative banking services highly depends on technology and high-tech communication system. For pursuing the E-banking services banks are using Information and communication technology (Internet, mobile phone, and other electronic devices) E- Banking services are totally technology based services. With the use of technology each officer in the bank is handling 60,000 clients. As per the traditional services a

banker is able to handle 100 clients per day but with the use of technology the number increased by 8 times per day(based on primary research).

6. Legal Issues:
To provide requisite legal support to the business and other related activities in cyber media, the government of India enacted the Information Technology, Act 2000 and Information Technology Amendment, Act 2008. But the Act does not carry any specific provisions regarding up gradation and adoption of technology. We need to follow guidelines through international IT standards and frame a suitable and major laws covering all the aspects.

Table – 6
Cyber Crimes – IT Act Cases - 2016

S.No	State	Tampering Computer Source documents (Sec 65)	IT Act – Computer Related offences (sec 66 and Sec 66 B to E)						Cyber Terrorism
1	2	3	4	4A	4B	4C	4D	4E	5
1	Andhra Pradesh	1	304	28	12	196	61	7	0
2	Arunachal pradesh	0	3	2	0	1	0	0	0
3	Assam	0	582	299	22	33	215	13	0
4	Bihar	0	272	255	8	9	0	0	0
5	Chhattisgarh	0	26	24	0	2	0	0	0
6	Goa	0	20	6	0	1	13	0	0
7	Gujarat	9	68	16	5	40	3	4	0
8	Haryana	1	337	44	13	33	244	3	0
9	Himachal Pradesh	0	16	13	0	1	1	1	0
10	Jammu&Kashmir	0	18	9	0	8	1	0	0
11	Jharkhand	0	258	124	16	111	7	0	0
12	Karnataka	3	996	224	27	344	370	31	0
13	Kerala	2	146	60	2	26	28	30	1
14	MadhyaPradesh	2	152	34	2	53	63	0	0
15	Maharastra	5	235	69	3	69	85	9	1
16	Manipur	0	0	0	0	0	0	0	0
17	Meghalaya	0	36	3	0	19	11	3	0
18	Mizoram	0	1	0	0	0	0	1	0
19	Nagaland	0	2	1	0	1	0	0	0
20	Odisha	0	6	5	0	0	0	1	0
21	Punjab	4	59	38	3	3	8	7	0
22	Rajasthan	2	243	103	7	96	31	6	0
23	Sikkim	0	1	1	0	0	0	0	0
24	Tamil Nadu	0	71	21	0	16	22	12	0
25	Telangana	4	495	119	15	152	205	4	0
26	Tripura	0	2	1	0	0	1	0	0
27	UttarPradesh	35	2197	1731	56	247	144	19	7
28	Uttarakhand	3	29	26	1	0	2	0	0
29	West Bengal	4	181	42	3	64	66	6	3
30	Total	75	6756	3298	195	1525	1581	157	12

Col.4 = Col.4A+4B+4C+4D+4E
Source: Cyber Crimes in India – Statistics
(National Crimes Records Bureau Ministry of Home Affairs)

Under IT Act – Computer related offences as per Section 66 and Section 66 B to E (state wise analysis) Uttar Pradesh ranked 1 with 2,197 cases followed by Karnataka 996 cases, Assam 582 cases, Andhra Pradesh 304 cases, Bihar 272 cases, Jharkhand 258 cases, Rajasthan 243 cases Maharashtra 235 cases and rest of India below 100 cases.
As per Section 66 (IT Amendment Act 2008) deals with any person who sends through computer information which is offensive, causes annoyance, electronic mail to deceive the recipients, is punishable with imprisonment upto three years or with fine or with both. Section 66 B to E deal with punishment for dishonestly receiving stolen computer resource or communication device, punishment for identity theft, punishment for cheating by personation by using computer resource, punishment for violation of privacy.

CURRENT TRENDS AND DEVELOPMENT IN TECHNOLOGY

With the development of technology banks are delivering the products which are attracted by the customers and customers have also tasted the power of technology in their day to day life including the way banking is done. Now it is the banking processes that need to evolve to achieve customised products.

The current trends and development in technology are in the areas of social media, mobility, analytics and cloud (SMAC)

SMAC will drive banking or banks will leverage SMAC for their business and provide products and services.

Social Media: Social media is enabled by internet. With the use of smart phone coupled with all the app's that are available, adoption to social media is made very easy. Indian Banks have started using social media in their regular operations in various forms and at different stages of maturity. Some banks use their face book page to provide customers exclusive offers, product details and customer care services.

Social media has some issues about freedom of expression. Banks feel they may not be able to face the negative comments or feed back once they are in the space. But it is better to be in the centre and make use of opportunity to speak about their products and take the opportunity to address the customer grievances from the banks point of view.

Banks should focus on face book and expand their reach and connectivity. Banks not only use the net working capabilities of social media but also use the analytics in the back ground to understand and serve the customer in better way. This will allow banks to integrate products and services in a better way. Bank can also use social media platforms for quick re-dressal of customer queries and grievances.

Mobility: With the increasing number of mobile phones almost millions of people in the world use smart devices for banking.

Various delivery channels are offering customers the convenience of banking from their office or home. Traditionally card based transactions require the card to be swiped on the Pos terminals at the merchant end. Next came the 'Cards not present' transactions using internet.

The next step in the process of evolution is mobile payments at Pos terminals. All major card operators are upgrading or replacing the Pos terminals that also facilitate NFS based mobile payments. NFS based communication can support both the legacy card transactions as also mobile payments.

Analytics: Cloud computing and Analytics are two imperative buzz words in today's enterprise. Analytics provides solutions to banks facing business and operational problems on a daily basis. Basic reporting using descriptive analytics is mandatory for senior executives in banks. With the large amount of computing resources available in the form of cloud, mobile devices, IoT and variety of the data in terms of interaction on social media channels, transactions, big data has the opportunities for cross selling and understanding customer need better. It helps in retaining valuable customers and acquiring new customers. It also provides opportunities to perform security analytics, improving coding practices for secured application development and understanding the impact of defect in terms of application security. Big data Analytics is still challenging and time demanding task that requires expensive software, large computational infrastructure and effort.

Cloud Computing: cloud computing is bringing greater amount of transparency in IT procurement. A cloud deployment model describes the nature, purpose and exact category of the cloud environment. They are four cloud deployment models a) Private Cloud b) Community Cloud c) Public Cloud d) Hybrid Cloud. Most of the banks prefer private cloud and community cloud as the most acceptable cloud deployment models. However, many potential and prospective users have fear and doubt on privacy and security on cloud computing.

Though NIST, CSA, IDRBT Cloud Security Framework for Indian banks provide guidance on cloud security, cloud software stack providers may take a step back and re think on their approach of software development and in providing a full proof system.

ARTIFICIAL INTELLIGENCE:

With the advances in artificial intelligence it is no longer necessary for the banks to deploy manpower to answer customer query. With AI and natural language processing BOTS can be used to address the customer queries and grievances.

CONCLUSION

With the advent of technology the transactions of banking and delivery of banking products will become more customers friendly. The shift is towards branch less, paperless, contact less, and card less banking with more technological emphasis. To cope up with the fast changes in the technology, regulation and market space, banks have to constantly innovate and try to remain ahead of the curve. The saying goes that only those, who innovate change, lead, others who adapt, may be able to survive. So, bank must be prepared to constantly invest in technology and embrace new developments taking place in technology. Employees will have to be trained and skilled on an ongoing basis. At the same time efforts will also be required to educate the customers in safe use of technology. Unless the customers are aware of the security features of the banking systems there is possibility of breach of the system. Gamification and leveraging social media channels are the tools for improving customer awareness. In addition to customers' awareness, as per the guidelines of RBI, banks need to put in place mechanism for redressal of customer complaints.

Ultimately, the proof of technology adoption is in the improvement of services to customers across all economic, social and geographical sectors.

SUGGESTIONS

Almost all banks offer digital channels to their customers. Banks can be happy with the adopters of digital channels but they have to look at non adopters seriously. The reasons for non adoption may be different among the groups like convenience, necessity, security, lack of confidence etc. Among the non adopters, while postponers can be effectively converted into users, real challenge for the banks is to bring the opponents and rejecters into the digital channel eco system. Banks have to re work on the digital strategies specific to those groups in addition to increasing the awareness levels.

As we all move to digital world, strength of security is of very great importance. The better the security strength, higher the level of trust reposed. When more and more customers experience trouble free and fraud free transactions, in the alternative delivery channel, the trust in banking system get multiplied in manifold. Based on the increasing threat banks are facing from technology, the following security features need to be incorporated in order to reduce the chances of the digital fraud and also to protect customer interests;

- Login procedure should be made more robust to avoid unauthorised access.
- Due diligence needs to be exercised by the banks and customers.
- Proper security measures needs to be followed.
- Education of customer to prevent them falling prey to phishing attacks.

- Ensure that computer systems are protected from malware attacks.

There is a need for the nations as a whole to improve the knowledge levels of those agencies in the areas relating to information security and cyber defence. Unless, the cyber crime investigation mechanism is able to handle the emerging attacks and help the banks to book the culprits and recover losses, it would be difficult for banks to fight the cyber war on their own.

There is a need to have a uniformly accepted standards and practices for information security risk across all financial institution, so that banks which follow these would be protected against future shocks arising out of IT security related outages. Customers should be educated on security features. Ensure that their computer systems are protected from malware like viruses and Trojans. Firewalls are major component for security purpose.

There is need for portals for receiving customer grievances, helpdesk to guide them and internal systems to ensure quick disposals.

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