REVIEW OF CORE BANKING SYSTEM FROM THE USABILITY PERSPECTIVE IN INDIAN BANKING

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Abstract: In this technical era, Indian banking industry has been changed a lot to cope up with the digital world. Technological advancements have improved the pace of the banking industry. Reserved bank of India, (RBI) has played an important and motivating role in all this. Now, almost all the banks in India has implemented Core Banking System (CBS). In this computing journey, the Reserve Bank of India (RBI) has played an important role in providing necessary and important guidelines,and recommendations for the implementation of CBS from time to time. But still, users of the CBS i.e. bank employees and customers are facing hurdles while using the system. The goal of this research study is to evaluate the literature to understand the usability issues that bank users – employees and customers have while using the Core Banking System and the delivery channels that it supports.

Keywords – Core Banking System (CBS), Reserve Bank of India(RBI), Local Area Network(LAN), Technology Acceptance Model (TAM), Human-Computer Interaction (HCI), Digitization, Usability

1.1 INTRODUCTION

The banking industry manages a country's finances, including cash and credit. Banks are the institutional bodies that accept deposits and issue credit to entities, and they play an important part in a country's economic standing. Banks are strictly regulated in most nations due to their importance in the economy. In India, the Reserve Bank of India (RBI) is the primary banking organization in charge of the country's monetary policy.

In the late 1980s, the Indian banking sector realised the need for computerization to improve client relations, accounting, and MIS accounting. In 1984, the Reserve Bank of India set up a committee on computerization in banks headed by Dr. C. Rangarajan.

1.2 TECHNOLOGICAL ADVANCEMENT IN BANKING SECTOR

First, banks started using personal computers (PCs). Banks connected with computers and banks started to use local area networks (LAN). Back then, LANs were used for Netware or Unix operating systems. Company information can be divided into branches according to the commercial activity of the branch. This is the true beginning of the march towards computerization.

Banks have started to implement Core Banking Solutions, which is the biggest change in Indian banking, extending the banking system to the banking system. "Core" stands for "centralized online real-time exchange". It then starts accessing the application from the bank database. Thus, branch banking changed to bank banking.

The next big step banks can take with CBS is "banking everywhere". This banking feature is really convenient for customers. Infosys, TCS, Finacle, BaNCS are some of the companies that make up important companies. Figure 1.1 depicts the phases of technology adoption in the Indian Banking System.

1970-80	Manual					
1980-85	Manual	Electro-Mechanical LPM				
1985-1990	Manual	Electro-Mechanical LPM	Advance Ledger Posting Machine			
1989-2000	Manual	Electro-Mechanical LPM	Advance Ledger Posting Machine	Total Branch Automation		
2000-2010	Manual	Electro-Mechanical LPM	Advance Ledger Posting Machine	Total Branch Automation	CORE Banking System	
2010 onwards						CORE Banking System

Figure 1.1: Phases of technology adoption by Indian

One of the largest contributors to the previous technology banking is Core Banking Solutions or CBS. CBS records the transactions that store customer information for the calculation of interest means a software application to complete the process of delivering the items in a single database. You can evaluate the full account data centrally. In this way, customers can connect to the bank through Internet banking, mobile banking, telephone banking, ATM, etc. desired channel.(Chowdhary, 2017)

In this computing journey, the Reserve Bank of India (RBI) has played an important role in providing necessary and important guidelines, guidelines and recommendations for the implementation of CBS from time to time. This helps the bank achieve its goals. The Reserve Bank of India has made an effort to encourage banks' payments and settlements.

In August 2010, the Reserve Bank of India (RBI) mandated the Core Banking Solution (CBS) for all banks intended to conduct business electronically, where customers store data in a central database accessible to all branches of the bank. All banks must complete the implementation of Core Banking Solutions (CBS) within three years.

The Reserve Bank of India (RBI) also mandated a deadline for Co-operative Banks and advised them to implement the Core banking solutions (CBS) by December 31, 2013 in India.(RBI/2012-13/437 UBD.BPD.(PCB). Cir No.42/09.18.300/2012-13, n.d.)

1.3 NEED OF THE RESEARCH

Exploring this entire situation, according to various RBI directives, banks in India are using computerized systems for almost the last two decades for performing different banking functions. But now they are heading toward more online transactions. The most important thing to remember is that bank workers are not technical people. They are familiar with how CBS works and use it. While transitioning from traditional banking to technological banking, they are running into issues.

E-banking such as ATM, Internet Banking, and Mobile Banking has resulted in reducing costs drastically and has helped generate revenue through various delivery channels. The number of customers has also increased because of the convenience of 'Anywhere Banking'. But while using these e-Banking services, the average customer is facing a problem. They prefer to visit banks and perform their transactions over these e-Banking services. Customers are facing several hurdles, e.g. issues related to trouble-free and self-explanatory interaction.

Not only users but also organizations are affected adversely by these difficulties. No other medium than the Internet – the fastest-growing form of communication media in history has ever confronted its new users with such vast and diverse difficulties of use.(Berners-Lee, 1999)

Even nowadays as the Internet is used as a common instrument, but its utilization often evokes problems. The banking applications are considered one of the most successful and most established applications ever and the fact that Internet Banking contains many interesting characteristics from the usability point of view (multi-stage processes, diverse and complex basis, independent transactions, etc.). (Pikkarainen, 2004)

The goal of this research study is to evaluate the literature in order to understand the usability issues that bank users – employees and customers have while using the Core Banking System and the delivery channels that it supports.

To enhance the relevance of the research study, the researcher attempted to focus on industry-specific empirical results along with the rich literature from the banking industry. To carry out the current research study, the researcher has reviewed the literature related to,
- Implementation of CBS by the Indian Banking Industry
- Various Usability aspects implemented while designing software, and websites such as
  - ✓ Technology or software acceptance parameters
  - ✓ Human-Computer Interaction (HCI)
  - ✓ Security measures with respect to usability

1.4. LITERATURE STUDY

According to the Reserve Bank of India (RBI), all banks in India must to implement CBS. Almost all public and private sector banks have adopted this change. But cooperative banks in our country are still struggling in this. RBI has also made it compulsory to adopt CBS gradually by large Urban cooperative banks by Dec31,2013, tier-I banks by June 30, 2014, and unit banks by Dec 31, 2014. (RBI/2012-13/437 UBD.BPD.(PCB). Cir No.42/09.18.300/2012-13, n.d.)

Malathy.K, Dr.Subhashinisrivatsa(2018), in their research paper titled, '*Impact Of Core Banking Solutions On Bank Employees-A Study In Dakshina Kannada District Of Karnataka*' studied the opinion of 100 bank employees of Dakshnina Kannada District about their experiences of the use of CBS. The paper focuses on the contributions and confusion caused by CBS. It also studies the major changes in the mode of banking operations, which caused satisfaction or dissatisfaction among bank employees. The authors have given an important suggestion that more user-friendly CBS software is recommended especially in rural areas, in rural languages, and in remote branches of banks. Even if employees are using CBS for years, they still get confused while adapting themselves to the change so banks should train them from time to time to deal with these intricacies. (Malathy.K, 2018)

Burhan SuryoAmbodo, Rudy Suryanto, HafiezSofyani(2017), in their research paper entitled - '*Testing of Technology Acceptance Model on Core Banking System: A Perspective on Mandatory Use*' studies the acceptance of CBS in BPD DIY Wonosari Branch, Indonesia. Researchers have conducted the survey and gathered the data from bank tellers, customer service, and back-office. Data were measured on a 5-Likart scale. The sample of the study involves all employees involved in front-office and back-office processing. The result showed that ease of use, satisfaction, and compatibility have a positive effect on attitude toward use. In the model of compulsory use of information technology. (Burhan Suryo Ambodo, 2017)

LasanthaThennakoon (2019), in her Ph.D. thesis, '*How the core banking systems impact on employee behavior of a small banking institution*' investigated how the CORE Banking System (CBS) impacts employee behavior from a small banking institution standpoint. The research findings show that within the bank, and among different job functions and core banking modules, the employee reaction to a new CBS is not similar. Employees using specialized CBS modules reacted negatively whereas employees using standalone CBS modules reacted positively. In the research findings, the researcher listed some of the below success factors that influence the reaction of employees,

- Employee training
- Post-implementation support
- Integration of all modules
- Process Alignment

Based on these findings, the researcher concluded that only capital investment on CBS does not result in the positive behavior of employees unless it is supported by the above-mentioned success factors.(Thennakoon, 2019)

CA Kuntal Shaha(2014), in his article 'Core Banking System', has sketched the future scenario of the Core Banking System at the same time he has listed out challenges that will be faced by the banking industry. He mentioned that the biggest challenge that the banking industry will have to face is customer expectations. He has rightly assessed that customer is more informed and aware than before. Customers require more and more delivery channels and services. In his article, he has also given an overview of CBS software – Finacle, BaNCS, Flex Cube(Kuntal Shaha, 2014)

J. RamolaPremalatha& N. Sundaram(2014), in their paper 'Reasons for Non-Adoption of Internet Banking: A Study with Reference to Vellore District of Tamil Nadu, India' concluded

that - Common Man is not aware of the security measures taken by the banks, hence has his own reservations in the using Internet Banking. Hence it is the duty of the banks to educate the consumers regarding the safety measures taken by the banks to avoid phishing and encourage their clientele to open Internet banking.(J. Ramola Premalatha, 2014)

AdaneKebkab (2012), in his thesis 'Improving Usability of Banking Websites – By Implementing User-Centered Design' designed a model for developing a usable website for the banking industry by taking into consideration the users as the center of the design process by using a user-centered design. Also, while carrying out this study, he has come across one of a very interesting ideas that can be further investigated for conducting a deep study on the impact of the security feature of the banking application in the design process of a usable banking website.(Kebkab, 2012)

The thesis entitled, 'Success of Implementation of Core Banking Solutions – A Study of Factors Involve" carried out by Ayana Johny (2016), focuses on IT implementation as an organizational modification process. The researcher has evolved a holistic model for successful enterprise information technology implementation because of the study. The study gives answers to two main questions – First, what are the factors that contribute to effective IT adoption and implementation, and second how do the identified factors affect CBS implementation? According to the author, thirty-four elements that contribute to IT implementation success have been identified. And two important factors that contribute to the successful implementation are Usability and Security of the system.(Johny, 2016)

JhumkeeIyengar and Manisha Belvalkar (2010), in the paper entitled 'Case Study of Online Banking in India: User Behaviors and Design Guidelines' concluded that system design with user's success as focus, content understandable by 'anybody', supported with demos and help to reduce intimidation, will justify investment in online banking through increased usage by satisfied customers. (Jhumkee Iyengar, 2010)

Neha Dixit and Dr. Saroj K. Datta (2010), in their research paper 'Acceptance of E-banking among Adult Customers: An Empirical Investigation in India' investigated the acceptance of online banking among those customers who are the more than 35 age group. Specifically, the study was carried out to check the effect of security and privacy issues on the acceptance of online banking in India. In these, questions were asked with possible acceptance factors of whether they are ready to adopt online banking or not. Data analysis confirms that security and privacy, trust, innovativeness, familiarity, and awareness have a positive influence on the acceptance of e-banking services in India. Also, data showed that participants are ready to try experiencing e-banking if banks give them the necessary guidelines and training. So, there is a need to provide a better and more customized service environment to the customers. The study also showcased that, adult customers are reluctant to join new technologies or methods that contain risks. Also some customers are interested in online banking but they do not possess the computer literacy to conduct it. (Datta, 2010)

Roman Zollet, Andrea Back (2010), in their research paper 'Website Usability for Internet Banking', concluded that higher recognizability of the next step results has positive effects on usability. The aim of this investigation is to improve the limited collection of methods for quantifying web application usability, which have not changed for years. The Authors have

developed a model which describes the relationship between usability dimensions and success variables. Then hypotheses are validated by conducting an experiment for testing Internet Banking applications. The outcome of the test showed that increased recognizability, real-world metaphors, compliance with dominant design, and anticipating support proved to lead to higher perceived ease of use. So, in the discussion, the authors mentioned that usability consists of single, distinguishable factors, which affect a system's user-friendliness. (Roman Zollet, 2010)

Dr. Roshan Lal, Dr. Rajni Saluja(2012), in their research paper entitled ‚'E-banking: The Indian Scenario' has addressed the challenges faced by Indian banks in the adoption of technology and made recommendations to tackle these challenges. The authors also discussed the benefits and risks associated with the different delivery channels offered by CBS. The research paper analyzes the progress made by the Indian banking industry in the adoption of technology. After doing the analysis, the authors have given the recommendation that customers should be made literate about the use of e-banking products and services. Employees of banks should be given special technical training. Seminars and workshops should be organized on the healthy usage of e-banking. E-banking services should be customized based on age, gender, occupation, etc so that the needs and requirements of people are met accordingly. (Dr. Roshan Lal, 2012)

Davis, F.D. (1986) in his doctoral dissertation proposed 'A technology acceptance model for empirically testing new end-user information system: Theory and result'. Technology Acceptance Model (TAM) highlights the two factors of the technology, perceived usefulness and perceived ease of usefulness. According to this model perceived usefulness and perceived ease of use determine the user's attitude toward the adoption of new technology. (Davis, 1986)

Jakob Neilson (1993) in his book 'Usability Engineering' highlighted that usability is multi-dimensional. The book explained the concept of usability in detail. In his book, he has elaborated 5 dimensions on which usability can be measured. Such as learnability, efficiency, memorability, error tolerance, and satisfaction. He also mentioned the importance of these dimensions may vary from product to product.(Neilsen, 1993)

Ivan Flechais, Cecilia Mascolo, and M. Angela Sasse(2007) have given an emphasis in his research paper entitled 'Integrating security and usability into the requirements and design process' that users of the online system can have massively different levels of experience, knowledge, and expertise. So designing a system that properly holds these differing levels of users, training is vital. He also mentioned that designing and developing such a secure software system requires one more important parameter usability. Flechais and his team have presented a method, Appropriate and Effective Guidance for Information Security (AEGIS), which provides important tools for developing secure and usable systems. It is a software development process and uses the semantics of Unified Modelling Language (UML).(Ivan Flechais, 2007)

Lorrie Faith Cranor and Simson Grafinkel (2008) highlighted in their book titled, "Security and Usability: Designing Secure System that People Can Use" that Security experts have overlooked usability issues because they often failed to recognize the importance of human factors. In this book, the authors have elaborated on the concept of Human-Computer Interaction with keeping security at the center. The authors have addressed the issue of the

tradeoff between usability and computer security. Both authors have also given their stress on how to design a secure system that is usable for untrained computer users. This book is intended for both, academic and professional learning. This book starts the discussion, with new ideas, and further advances in this important field. (Lorrie Faith Cranor, 2008)

F. Sahar (2013), in his research paper "Trade-offs between Usability and Security", discusses potential trade-offs between usability and security in the software development process by proposing policies. Usability use and security are becoming key issues of modern computer software design. Nonetheless, there are studies that have been conducted in various combinatorial ways on these subjects. However, there is still room for improvement in the relationship when it comes to properly providing these functions in software applications. (Sahar, 2013)

1.5   CONCEPTUAL DEVELOPMENT AFTER REVIEWING THE LITERATURE

1.5.1   Digitization and CBS Impact On the Banks

The researcher learned that reviewed literature talks about benefits of the digitization or CBS implementation. The digitization of banks has changed the attitude of the work culture. From branch banking to bank banking, banking style, and banking belief has been transformed. Anytime, Anywhere banking is possible due to the implantation of CBS in the banks. According to Kuntal Shaha (Kuntal Shaha, 2014) Customers are happy with more and more delivery channels. It has given flexibility to customers. Report generation has become an easier task than traditional manual banking.

Also this literature has raised some issues related to the digitization or implementation of CBS. CBS requires more people with extra technical knowledge along with educational qualifications. Also in rural areas or in the case of the small-scale bank's cost of implementation is the biggest issue. Specifically, cooperative banks, societies implementing CBS, infrastructure cost, hardware cost along with technology cost is more than the benefits that banks achieve. Software knowledge is one of the issues. Malathy K. (Malathy.K, 2018) in her recent study noticed that even after providing the training to the employees, they do not feel comfortable while using the software. More user-friendly software in rural languages is required in the rural, remote branches of banks.

1.5.2   Usability / Security of CBS – Employee Perspective & Customer Perspective

The researcher treats this as an important key component of the literature review. While reviewing the literature from this area researcher found that unfortunately, very little literature is available from the employee's perspective as compared to the customer. The customer does not directly deal with CBS. CBS implemented in the banks provide various delivery channels such as the internet or online banking, ATM, NEFT, etc. to the customers to enhance their banking experience.

The researcher, Bhavesh Parmar (Bhavesh J. Parmar, 2013), mentioned that Internet banking should be time-saving, convenient to use, user friendly. Also, Customers should feel secure while using Internet banking because there is no physical entity that exists while doing banking

operations. Many of the customers are reluctant to join the new technology that contains risks whereas some are interested but due to little technical knowledge they are not using Internet banking.

While accessing the literature, some of the literature showed the trade-off between the usability and security of the software system. Various research papers suggested that these two parameters are very important from an implementation point of view of software.

1.5.3 Technological Concepts – Theories and Frameworks

The researcher has also studied the latest technologies that can be used for the banking domain. Apart from CBS, research studies also concentrate on the usability aspect of CBS. Different usability theories and frameworks are available in the literature. While reviewing this literature, the researcher come across the Technological Acceptance Model devised by (Devis, 1986). Many of the researchers have used TAM to evaluate the usability of CBS. Where Usability is a multidimensional concept that is measured by 5 attributes. (Nielsen, 1993). One of the important aspects of any system is Security. And when CBS is there, security is core. Some literature specified that as we increase the security of the banking system its performance from a Usability perspective decrease.

1.6 RESEARCH GAP AND CONCLUSION

The above literature has given ample insights about the banking services and use of technology in the banking system, but the literature shows a huge gap in assessing the impact of the Core Banking System (CBS) on the Indian banking system, more precisely Cooperative banks.

Keeping all this in mind the researcher has listed the research gaps that need to be focused,

1. Both public and private sector banks were the focus of the previous study. Hardly any research has been done on cooperative banks. Care is therefore desperately needed in this area.
2. There is a need to better understand CBS implementation from a usability perspective because most of the prior research has concentrated on subjects like the influence of developmental variables on bank growth, financial growth, customer happiness in online banking, etc.
3. One of the important aspects of CBS is security. Almost all banks have taken adequate care of security but hardly anyone has thought of providing security that is usable.
4. Most of the literature has shown its concern about Customer satisfaction with the use of internet/online banking which is one of the delivery channels of CBS but seldom efforts are taken to measure the satisfaction of the employees who are using it for the betterment of banks.
5. The banking staff's preference for existing processes and their reluctance to adopt newer, out-of-the-box functionality/processes from new solutions.

Most of the literature reviewed revealed that while providing different functionalities to banking software (CBS and its delivery channels) less focus is given to the usability

perspective of the system. Also banks are focusing on the security of CBS, which is an important part of any banking application Banking software has used many security mechanisms for securing the system from threats and attacks. But again, Usability with respect to security has been given very little emphasis making that interaction vulnerable to attacks.

Thus, this literature study would help in a great sense to bring newer insights and open the path for further study while developing Core Banking System software from a usability perspective.

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