

## A REVIEW ON INFORMATION COMMUNICATION TECHNOLOGY AND SERVICE QUALITY IN THE BANKING INDUSTRY

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### Abstract:

India is one of the fastest growing economy in the world. Adoption of new economic policies in the country has given immense opportunities to develop the country. To responds to today's dynamic business and competitive nature, many banks in India are providing e-banking to gain the customer's satisfaction and maximize profit. In e-banking system the bank has a centralized database that is web-enabled and provides e-services. E-services can be defined as "deed, effort or performance who utilizes Information and Communication Technology(ICT) which includes elements of e-tailing, customer support and service delivery." While E-banking has improved efficiency and convenience, it has also posed several challenges to the regulators and supervisors. This paper is the review of researches carried out in the field of e-banking whose delivery is mediated by Information and Communication Technology (ICT). Authors discuss the number of researches carried out in the area of e-banking in terms of customer's perception towards e-services, technology, service quality, privacy and security. In this paper authors also describe how Information and Communication Technology (ICT) is important in e-banking to improve the performance and efficiency of banking transactions and to bring new quality to services as it re-organizes knowledge and effectively incorporates intelligent access to and use of the data in e-banking.

**Keywords:** Information and Communication Technology (ICT), e-services, e-banking.

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## 1. Introduction:

E-banking is a generic term for delivery of banking services and products through Information and Communication Technology (ICT), such as the telephone, the internet, the cell phone, etc. E-banking means any user with a personal computer and a browser can get connected to his bank -s website to perform any of the virtual banking functions. The concept and scope of E-banking is still evolving. It facilitates an effective payment and accounting system.

Information and Communication Technology (ICT) is the automation of processes, controls, and information production using computers, telecommunications, software and ancillary equipment such as automated teller machine and debit cards. Use of ICT includes account opening, customer account mandate, and transaction processing and recording. Information and Communication ICT advances (networks, computing power, applications, etc.) have enabled disbursed information to be assembled into accessible complex organizational database knowledge repositories. Technology has provided self-service facilities (automated customer service machines) from where prospective customers can complete their account opening documents direct online and also validate their account numbers and receive instruction on when and how to receive their chequebooks, credit and debit cards and sends text messages to mobile phone. ICT is used in banking in three main ways – processing cheques, operating ATMs and it allows home banking. Home banking uses the Internet or telephone/mobile to give the customer access to their bank accounts 24-hours a day. It allows people to make payments and transfer funds at any time, again making it more convenient for the customer.

## 2. Literature review:

### I. **E-banking in India**

E-banking has been viewed as a revolutionary progress in the banking industry. As predicted by Microsoft's Bill Gates – *Banks are dinosaurs and will be replaced by microcomputers*. Foreseeing the threat and the challenge from the Mr. Gates' comments, as an industry, the banks are formulating strategic plans to fight back in winning their customers (Healy, 1999). Their first target is the new technology – including all new telecommunication and computer technology.

The industry believes that by adopting new technology, the banks will be able to improve customer service level and tie their customers closer to the bank.

In India Many of the banks like ICICI, HDFC, IndusInd, IDBI, Citibank, Global Trust Bank (GTB), Bank of Punjab and UTI were offering E-banking services. Based on the analysts' comments that India had a high growth potential for e-banking. The players focused on increasing and improving their E-banking services. As a part of this, the banks began to collaborate with functions online.

(RBI survey) Approximately one percent of high and middle-income group conducted banking on the Internet in 2000 compared to 5 to 6 percent in Singapore and South Korea. In 2001, a Reserve Bank of India survey revealed that more than 20 major banks were either offering e-banking services at various levels or planned to do so in the near future. Some of the private banks included ICICI Bank, HDFC Bank, Indus India Bank, IDBI Bank, Citibank, Global Trust Bank, Bank of Punjab and UTI Bank.

In the same year, out of an estimated 0.9 million Internet user base, approximately 17 percent were reported to be banking on the Internet. The above statistics reveal that India does have a high growth potential for e-banking. The banks have already started focusing on increasing and improving their e-banking services. As a part of this, the banks have begun to collaborate with various utility companies to enable the customers to perform various functions online. In 2001, over 50 percent of the banks in the US were offering e-banking services. In 2011 the ratio is 7 times than 2007.

In the recent years there has been explosion of Internet based electronic banking applications. Beckett, Hower & Howcroft (2000) states that the emergence of new forms of technology has created highly competitive market conditions for bank providers. However, the changed market conditions demand for banks to better understanding of consumers' needs. Banking has never been more important to our society than it is today. The advance of communication and computer technology and the availability of the internet have made it possible that one can do most banking transactions from a remote location even without stepping into a physical financial structure – *i.e.*, the emerging of e-banking (Boyes and Stone, 2003).

According to L Harris(2002) , many banks provide e-services which is the common trend in India. No more falling in line in banks, no more waiting tons of hours in the bank, no more days and weeks of waiting. All can be done with one card, one gadget. It's easy, it works, and most importantly, people like it. But still, some people are having a hard time using this kind of technology mostly people who are used to do things the old traditional way. With the use of advertising, people are now motivated to use E-banking because again, it eliminates the hassle encountered when using the old process of banking. Some people believe that online banking will be the most popular method in the future.

The e-banking option will in fact as an effective way to reduce the costs of operations for the financial institutions. But in practice, larger banks located in a centralized urban area tend to have the greatest incentive to adopt e-banking services, while in comparison, smaller community banks tend to have a high initial technological cost in developing e-banking services (Treadwell, 2001).

As an integral part of the e-business, the e-banking industry has been growing at a rapid pace, to help banks cut costs, increase revenue, and become more convenient for customers (Halperin, 2001).

"Use of the Internet for banking has seen a massive rise in the 2010-11 survey, taking the overall number of bank consumers who use the Net to close to 7 per cent of the total bank account holders -- a seven-fold jump since 2007 -- even as for the first time in the past 13 years, branch banking has come down by a full 15 percentage points during the same period," McKinsey & Company India partner and head of its retail banking services Renny Thomas said. According to Thomas ( India personal financial services survey 2011 in Mumbai on Wednesday) The percentage of online users of banking transactions was just about 1 per cent in the agency's 2007 survey,

## II. Perception of Customers towards e-services

According to Mehvish Rasheed.[ **Journal of Public Administration and Governance** ISSN 2161-7104 2011, Vol. 1, No. 2] On the basis of analysis and findings, it can be concluded that

service quality and banks' financial performance are associated through customer satisfaction in the environment of automated service quality in banking.

Electronic banking is offering its customers with a wide range of services: Customers are able to interact with their banking accounts as well as make financial transactions from virtually anywhere without time restrictions. Adult customers are changing their existing pattern of use of traditional banking and switch over advanced self-service technology (Curran and Meuter, 2007).

Empirical studies from the consumer side of e-banking have been reported recently, such as one focusing on the quality of customers on the utilisation of current e-banking services (Hitt and Frei, 2002), and another recent one examining the customer attitudes towards e-banking and concluding that online banking marketing will gain importance at a faster rate in the coming years (Kaynak and Harcar, 2005).

Other new e-banking services have targeted mortgage lending, consumer lending, and small business loan products. As an integral part of the e-business, the e-banking industry has been growing at a rapid pace, to help banks cut costs, increase revenue, and become more convenient for customers (Halperin, 2001).

While larger and national banks are currently leading the way in the e-banking forefront, most small and local community banks are reported way behind in this effort – due to the fact that those smaller community banks were in general lack in both financial and technological resources (O'Connell, 2000).

A recent research even investigated the impact of e-banking on building inter-firm relationships within 200 Australian banks and showed that an effective e-banking may enhance inter-firm relationships through improved traditional communications (Rao, 2004). Due to different motivational factors, however, banks, larger and small or located urban or suburban, have placed different priorities and investments in their e-banking efforts.

Hill (2004) conducted a study concerned with identifying the characteristics of online banking users. She mentioned that it is commonly assumed that demographics do influence the acceptance of electronic self-service tools, such as online banking. The results of the study were

that people who use such services are young, trendy and high earning. They actively seek out online banking tools, and they want to conduct all transactions through the same channel.

Nevertheless, Lee (2000) conducted a similar research and arrived at different results. He found that the Customer Relationship Management (CRM) efforts of the banks themselves have the real influence on who accesses online self-service tools than any other factor. Therefore, customers tend to use such tools based on attitudes, not demographics.

On the other hand, other studies have shown that older people want the same things as users in general: a site that is easy to use, fast, clear, and secure. On the whole, it seems that the expert majority's opinion is that older people need separate internet sites, or at least modifications of existing ones (Judd, 2000), incorporating for instance larger font sizes and simpler graphics.

financial transactions in Saudi Arabia (Sohail and Shaikh, 2007).

According to Pooja Malhotra, Balwinder Singh, (2007) "Determinants of Internet banking adoption by banks in India", *Internet Research*, Vol. 17 Iss: 3, pp.323 - 339. The larger banks, banks with younger age, private ownership, higher expenses for fixed assets, higher deposits and lower branch intensity evidence a higher probability of adoption of this new technology. Banks with lower market share also see the Internet banking technology as a means to increase the market share by attracting more and more customers through this new channel of delivery. Further, the adoption of Internet banking by other banks increases the probability that a decision to adopt will be made.

An empirical study by Pew Internet & American Life Project dated 2002 was concerned with the number of people banking online and their gender in addition to their age. The study found that men are somewhat more likely to bank online than women. Also, younger and middle-aged Internet users are the most likely group to turn to online banking. The highest category using online banking in the survey was people aged 30 to 49, the lowest category is above 65 and the rest of them are in between.

Of great value was the study of Mattila et. al., (2003). The study was concerned with analyzing the adoption of Internet banking among adult customers. The results show that people over the age of 65 generally tend to be late adopters of technologies. They found that adult customers who discontinued the use of online banking blamed insufficient or nonexistent training on how to

use the technology. They also pointed that confusing web pages and complex steps discouraged their adoption of online banking. Subsequently, they recommended developing three dimensional web pages with voice recognition, using video technology to provide access to bank employees.

Also, Sohail and Shanmugham (2004) wrote a paper concerning customers' preferences in E-banking in Malaysia. Their results were based on a survey of 300 respondents. Their conclusion indicates that age and educational qualifications of electronic and conventional banking have no significant impact on E-banking adoption. Instead, they argued that accessibility to the Internet, awareness of E-banking and customers' resistance to change are the main factors influencing the adoption.

### **III. Security and Privacy:**

Now day's uptake of EC(Electronic Commerce) applications in the banking industry is very slow only because of security and data confidentiality issues have been a major barrier. Security and privacy are one of the most challenging problems faced by customers who wish to trade in the ecommerce world. Security in the form of keeping customer safe from an invasion of their privacy, affects trust and satisfaction. If company wish to maintain customer trust, they need to keep their promises regarding security and privacy. Since security is closely related to trust, violations of security norms may backfire in terms of losing customers and negative word-of-mouth. Security perceptions are defined as "the subjective probability with which consumers believe that their private information will not be viewed, store and manipulated during transit and storage by inappropriate parties in a manner consistent with their confident expectations" (Pavlou 2001).

According to Rahmath Safeena, Hema Date and Abdullah Kammani National Institute of Industrial Engineering (NITIE), Mumbai, India[International Arab Journal of e-Technology, Vol. 2, No. 1, January 2011] Banks need to engage in security enhancement activities such as encryption, firewall, and user protection and authenticity. Trust is one of Internet Banking Adoption in an Emerging Economy: Indian Consumer's Perspective 61 the more influential factors, implying that controlling the risk of online banking is more important than providing benefits.

The banking sector was reluctant to use e-commerce applications as they felt that transactions conducted electronically were open to hackers and viruses, which are beyond their control. As well as convinced that online services are a mixture of customer insecurities, technology investment costs and a lack of market-readiness have all conspired to make e-banking 'unattractive' (Abdulwahed and Yaqoub, 2006).

Perceived risk was one of the major factors affecting consumer adoption, as well as customer satisfaction, of online banking services (Polatoglu and Ekin, 2001). Perceived risk usually arises from uncertainty. Howcroft et. al., (2002) the principal characteristics that inhibit online banking adoption are security and privacy. An interview held on web security and showed four screen shots of a browser connecting to a website and asked participants to state if the connection was secure or not secure and to affirm the motivating factor for their appraisal. It was discovered that about 72 participants cannot tell if a connection is secure (Friedman et. al., 2002).

It is noted that although consumer's confidence in their bank was strong, yet their confidence in the technology was weak (Roboff and Charles, 1998). Today's consumers are increasingly more concerned about security and privacy issues (Howcroft et al., 2002).

Dr. David Chaum, CEO of DigiCash said that security is simply the protection of interests. People want to protect their own money and bank their own exposure. The role of government is to maintain the integrity of and confidence in the whole system. With electronic cash, just as with paper cash today, it will be the responsibility of government to protect against systemic risk. This is a serious role that cannot be left to the microeconomic interests of commercial organizations.

Potential customers mentioned Internet security, online banking regulations, consumers' privacy, and bank's reputation as the most important future challenges of online banking adoption. (Aladwani, 2001). Indeed, in Aladwani's (2001) study of online banking, potential customers ranked Internet security and customers' privacy as the most important future challenges that banks are facing. Perceived usefulness, perceived Web security has a strong and direct effect on acceptance of internet banking, too. A high level of perceived risk is considered to be a barrier to propagation of new innovations (Ostlund, 1974).

A majority of studies highlight the fact that "security" is the biggest single concern for customers when faced with the decision to use internet banking. Security has always been an issue, but its

scope has changed from mere doubts about the privacy of personal information to worries of financial loss (Sayar and Wolfe, 2007).

Recent advances in technology have created a surge in “technology-based self-service” (Dabholkar et al.2003). Such developments are changing the way that service firms and consumers interact, and are raising a host of research and practice issues relating to the delivery of e-service. E-service is becoming increasingly important not only in determining the success or failure of electronic commerce (Yang et al., 2001), but also in providing consumers with a superior experience with respect to the interactive flow of information. The financial system around the world has been facing a lot of changes.

Ganesan and Vivekanandan (2009) described a secured hybrid architecture model for the internet banking using Hyperelliptic curve cryptosystem and MD5 is described. Information about financial institutions, their customers, and their transactions are, by necessity, extremely sensitive; thus, doing business via a public network introduces new challenges for security and trustworthiness. Given the open nature of the Internet, transaction security is likely to emerge as the biggest concern among the e-bank’s account holders. The rapid growth in account hijacking and online fraud are on the rise.

The negative publicity damages consumer trust in the online service. Since personal and financial information can be intercepted and used for fraudulent purposes, online investing involves greater security concerns than conventional trading; users need a sense of security when conducting financial transactions, and it is still one of the major barriers to e-commerce growth (Lee and Turban, 2002).

#### IV. ICT and Service Quality:

According to Arjen Wasenaar (2000 IEEE) Within business (bank) culture, the flow of information in customer services and applications cannot be understood if detached from an ICT technical prospective. Emerging ICT technology like TCP/IP protocol for e-mail, File transfer protocol and hypertext are enlarging the range and reach of information exchange to improve, transform or redefine any form of resource and information exchange between involved actors like banks and their customers’.

Similarly, Internet banking allows customers to perform tasks at a time and in a place convenient to them. Dabholkar (1996) suggests that direct contact with such technology also gives customers a feeling of greater control. Smith (1987) is of the opinion that technology was introduced in banks originally to reduce costs but that, by dividing front and back office operations, technology can be targeted to enhance different functions. The dilemma still remains, however, as to how to maintain a satisfactory number of face-to-face interactions with the customers.

Rogers (2004) identified five characteristics or attributes of innovations that affect the rate at which innovations are adopted (and ultimately their usage patterns): their relative advantage, compatibility, complexity, divisibility (trialability), and communicability (observability). Additional characteristics were later added; perceived risk (Ostlund, 2005) and financial and social cost (Zeithaml, 2005).

In the categorization of services in technology-based service delivery options Dabholkar (1994) suggests there are a number of relevant classifications that will apply to industries employing technology based service delivery. The classification analyses “who” delivers the service. That is, person to person, where the employee uses the technology or consumer to technology, such as the use of an ATM. With “minimum waiting”. This also raises the design issue of sufficient menu options for ATM/Telephone and Internet bankers. In most cases the transaction occurs in a neutral location and the availability of an employee may not always be feasible since these facilities often operate 24 hours a day, seven days a week. Continuous improvements in the information technology have enabled banks to provide their services in a more direct manner to adjust their products better to the clientele’s needs.

In the public sector, the information constitutes the material and the public service the product. More broadly stated, to include the types of work done in the most public agencies, technology refers to the programme and procedure designed to respond to situations and process cases to achieve the results specified in the mandate of the agency. It does not refer to machines and equipment only but to the programmes and performance routines of the agency (Gortner et al., 1989). Utilization of technology today, offers dramatic and enduring improvements in enhancing organizational performance (Daven Port, 1993; Hammer and Champy, 1993; Holzer and Callanhan, 1998; Morton, 1991).

Recently, however, technology has had a remarkable influence on the growth of service delivery options (Dabholkar and Bagozzi, 2002). Dabholkar (1994) claims that when the customer is in direct contact with the technology there is greater control such as with Internet banking. However, if there is an absence of direct contact, such as with telephone banking (since the technology itself is not visible to customers who are able only to press numbers on their telephone keypad) it is assumed that there is less control perceived by the customer during this transaction. Bateson (1984) has conducted a number of studies on the need for consumers to have control during service encounters. When a consumer freely chooses to use technology as a form of service delivery the impact is high in terms of quality attributes.

Service quality has been recognised as having the potential to deliver strategic benefits, such as improved customer retention rates, whilst also enhancing operational efficiency and profitability (Cronin, 2003; Rust et al., 2001; Zeithaml, 2000). Oliveira et al. (2002) suggest that e-service quality is amongst a firm's competitive capabilities that lead to business performance, Roth and Menor (2003) see issues in implementing service technology and eservices as critical in service operation.

Rowley (2006) points out that the existing literature on e-service quality mainly study the dimension and measuring method of e-service quality, customers' online experience, behaviors, satisfaction, purchase orientation, and loyalty; and that there is no completely recognized definition of e-service. Rowley (2006) gives a definition in conclusion of many scholars' opinions, "e-service, based on information technology, includes the information provision and system support, the logistic transportation of service and the trace NBRI 1,3274 and exchange of information". Many scholars further divide this service into online business service and self-help service.

Santos (2003) and Gronroos et al. (2000) believe that the service quality of online business is the important index representing the enterprises' distinction, aswell as an important aspect of the competition advantages. How to appraise e-service quality has become the study object of various scholars. At present, the priority has been given to online retailers and online bank services. Thus, how to define and scale this service quality? Many scholars propose their own methods.

Parasuraman et al. (2005) believe that e-service quality, to some extent, refers to the effectiveness and efficiency of online browse, online purchase, and delivery of goods and services.

Yoo and Donthu's (2001) SITEQUAL believes the e-service quality includes four dimensions such as the accessibility, handling speed of the memorizer, the artistic design and the response rate of interaction.

Loiacono et al. (2002) develop theWEBQUAL to scale the service quality. They point out that e-service quality includes 12 dimensions including the information adaptability, trust, design, visual requirement, flow, business process, interaction, response time, intuition, creativity, overall communication, and replaceability.

Wolfenbarger and Gilly's (2003) EtailQ thus categorizes the service quality into such four dimensions as the site design, performance or reliability, privacy or security and customer service.

Yaobin and Tao (2005) further propose goodwill besides serviceability, accessibility and security, stating that goodwill is a very important factor involved in the online purchase. As contained in the above-mentioned literature, characteristics of goodwill have been partially represented in the scale of e-service quality.

### **3. Future Directions:**

Electronic banking, an upcoming trend in today's commercial world is widely demanded by citizens, companies and various other organizations. The ease of use and availability has been the striving business drivers in this sector; that has led to this new revolution of electronic banking. With the increasingly complex methodology of banking evolved over the information and Communication technology platform. In future, the research will expand to examine the 'Factors Affecting Continued Usage of Internet Banking' among the customers of public and private sector banks. Also, the research will provide e-service transparency for growing customer awareness. The research will also carried out to examine the relationship between the e-service quality dimensions and customer satisfaction from various dimensions like efficiency, requirement fulfillment, system accessibility, and privacy. The overall objective of this research

is to build an Information and Communication Technology (ICT) model for e- services quality by behavioral adoption theories in privet vs public sector banks to targeting the right customer and ensuring excellent service to these customers.

#### 4. **Conclusion:**

For the banking sector, the internet marks the transition from the brick and mortar stage of banking to the branchless stage. In a world, Information Technology (IT) has moderated the constraints of time, space, and information access in world trade and commerce as a whole. The e-banking is changing the banking industry and is having the major effects on banking relationships. Within banking culture, the flow of information in customer services and applications cannot be understood if detached from an ICT technical prospective. The widening use of ICT in e-banking is having profound impacts on e-services. The impacts of ICT are more than just those of efficiency and effectiveness. The impact of ICT is moving deeper and deeper into substantial economic and social science domains, where it increasingly interacts with them.

The literature provides an extensive account of the relationships between Information and Communication Technology (ICT), e-service quality, customer satisfaction, and financial performance. In this paper authors have briefly described the various researches carried out in the area of e-banking. This paper also states that how the adoption of technology is useful for banking organizations to identify, preserve and disseminate best context of e-service practices to satisfy the customers to achieve business goal. The purpose of this study is to offer insights into the e-banking adoption and its implications for e-banking growth in public and private sector banks in India.

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