

A Review of Security Aspects of Online and ATM Transactions in Banking Domain

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Abstract:

Banking improvements made customers to access their services more conveniently. Among the services offered by the banks, ATM services play key role to minimize customer's time and energy. The current technologies elaborate fast and were constantly bringing new area to our day to day life. This paper is also includes the literature review of security aspects of online banking and ATM transactions. The growth in online transactions has resulted in a greater demand for fast and precise user identification and authentication. The study is conclude that the e-banking and ATM is very convenient mode of electronic banking .Similarly to these studies, our target is to measure the performance of online banking and ATM transactions perform by using different technologies like Biometric Technology (Thumb, Iris, Face recognition etc.), and two way authentication as well as three way authentication process. This paper gives a brief literature review and examines previous research on different topics of security related issues in e-banking and ATM transactions.

Keywords:

E-Banking, ATM services, Biometric Technology, Authentication Process.

1.1 INTRODUCTION

Online banking system is the process of providing information and performing the transactions through Internet and ATM Securely. Online Transaction information in electronic way to a Bank's financial position, performance and specific flow of funds, period which are then provided to external users. The development of Information technology is so rapidly increasing the use of internet in our day to day life as a vital medium of communication. The services like ATMs, Phone and Internet Banking etc. are helping the banks to reduce their per customer service costs [5]. There has been branch of research activity in assessing the performance of virtualized resources in network security regarding online banking and ATM transactions systems and in general. The research makes use of a systematic research review taking in to consideration e-banking fraud and other electronic related fraud (ATM) or security related literature. Similarly, the Biometric methods can be implemented to enhance the security of the ATM which is broadly categories into Facial recognition by facial expression, Iris recognition by eyes pixels and Fingerprint recognition by thumb impression. A systematic literature review "is a means of identifying, evaluating and interpreting all available research relevant to a particular research question, or topic area, or phenomenon of interest"[5]. This paper discusses the recent developments in banking industry, various IT aspirations in the National and International Banking system, E-Security aspects in banking, cyber laws and RBI guidelines to regulate the e-security issues related to banks. The present research is focus to find out the security issues of online and ATM transactions on internet and also to analyze the different types of problems faced by common man and solutions on it by using different methods.

REVIEW OF LITERATURE

In the view of last Ten years (2005-2015) research studies conducted so far on Security Aspects of online banking and ATM Transactions

SR. NO.	AUTHOR	YEAR	TITLE	AREA/ COUNTRY	OBJECTIVE	FINDINGS
1	Wendy W.N. Wan	2005	Customers' adoption of banking channels in Hong Kong	HONGKONG	Paper evaluated the adoption of four main banking stations i.e. branch banking, ATM, telephone banking and internet banking in Hong Kong banks. They also highlighted the influence of demographic variables and psychological variables in adopting the distribution channels	The results of the study specified that among four stations, ATM was most regularly used followed by internet banking and branch banking. Telephone banking was the least agreed banking channel. Customers adopted these channels because of safety, security, convenience and speediness offered by them.
2	Lichtenstein & Williamson	2006	Consumer Adoption of Internet Banking	Australia	The paper focused on identifying key influences of internet banking and finds out a range of factors that inspire consumer implementation of internet banking in the Australian context. A framework is provided that conceptualizes and links consumer-oriented issues influencing adoption of internet banking.	The researcher could collect information from 32 people in depth individual and group interviews over six months that investigated Australian banking consumers' thinking in choice of banking methods, focusing on identifying key influences in consumer adoption of internet banking. Develop cheaper mobile alternative technology, Offer training on internet banking, Develop innovative consumer support solutions, Develop targeted strategies to improve women's access and internet self-efficacy.
3	Manoharan, B.	2007	Indian E-payment System and its Performance	India	The paper highlighted the E-payment system in India and its performance impact on Indian banking sector. They operate their business the author divided the payment system in India into three parts, i.e., large value payment system, retail payment system, and retail electronic system.	The study found that having a huge opportunity of e-payment system in India still 90 per cent of transactions were cash based. So, an effort should be made to increase the use of e-payment, and RBI should make efforts to strengthen the legal framework of electronic banking system.
4	Ramani D	2007	The E-Payment System	India	The paper studied the impact of e-payment system on Indian banking sector. E-payment was required for handling large volume of business payment and remittances for hassle free, quicker and faster payment remittances at low cost, and paperless transactions. The researcher highlighted various steps taken by RBI for the e-payment	The researcher found that RTGS deferred net settlement system such as electronic clearing services debit and credit, electronic fund transfer and NEFT methods had increased the use of core banking solutions, data warehousing and data mining.

5	DivyaVerma	2008	Security Issues in E-Banking	India	The present paper discusses the present development in banking industry to improve the security in banks e-security aspects in banking, cyber laws, and RBI guidance to regulate e- security issues related to banks. The Information Technology Act 2000 aims to provide legal framework to IT use and is the legal backbone for enabling E-commerce in the industry.	The focus of industry has shifted to service quality, customer orientation, and expansion of operation, revenue growth and cost reduction, transparency in disclosures, corporate governance & application of IT in operations.
6	Kamala J.S.	2008	Customer Satisfaction Towards ATM Services- A Study of Bank Customers in Navi- Mumbai	India	Researcher has made a detailed survey regarding the customer satisfaction towards ATM services in Navi- Mumbai.	Researcher found that the respondents were conscious about more innovative techniques in ATM service.
7	Sultan Singh, Ms. Komal	2009	Impact Of ATM On Customer Satisfaction (A Comparative Study of SBI, ICICI & HDFC bank)	India	The objective of this paper is to examine the scenario of three major banks. To analyze the present ATM facilities provided by SBI, ICICI & HDFC Bank and to analyze the post purchase behavior of customers regarding the different banks under study. As well as the impact of ATM on customer satisfaction by appraising the problems faced by the customers.	The result indicates the customer satisfaction level is highest for SBI at 79%, 2nd is ICICI Bank with 77% and 3rd is HDFC Bank with 73%. According to parameter the comparative study has done between 3 banks.
8	Barskar, Deen, Ahemed&Bharti,	2010	The Algorithm Analysis of E-commerce Security Issues for Online Payment Transaction System in Banking Technology	India	This paper study Algorithm analysis of E-commerce describes some algorithm that can be used to implement the online payment transaction security services.	The result analysis is to provide a mechanism for different transaction algorithm in e-commerce to serve the online transaction system the pay anonymity, digital signature and dual signature etc. is the best algorithm for such type of transaction, and it gives secure transaction security for online payment system.
9	GunajitSarma and Pranavsingh	2010	Internet Banking: Risk Analysis and Applicability of Biometric Technology for authentication	India	Paper throws light on providing banking services to customers using web with highly secured technology. Executing technology is the accountability of management. Authors highlighting the points towards the use of biometric technology in internet banking system, for risk management of banks regular activities through authentication. The researcher discussed about the growth in internet banking. There are numerous factors like competition, cost efficiencies,	Study indicates that banks with web-based banking realized significant benefits. Internet banking allows customer to conduct transaction at any time and so it decreases the number of physical visits to bank. In their study author found that biometric technology played an important role to control the risk factors through authentication system. The implementation of applicable authentication procedures should start with an assessment of the risk

					geographical reach, and branding and customer demographics. Internet banking creates new risk control	faced by the internet banking system.
10	W. Jeberson, Prof. Gurmit Singh, Dr. G.P. Sahu	2011	Analysis of Security Measures Implemented on G2C Online Payment Systems in India	India	The paper focused Most of the Indian Government to Citizen (G2C) online payment system were vulnerable to cyber-attacks	The analysis of results of the study shows that various security aspects about 81.48% of the online payment based services are password protected OS and 85.19% are using security protocol and 51.85% were secured though digital signature.
11	Sri Shimal Das, Smt. JhunuDebbarma	2011	Designing a Biometric Strategy (Fingerprint) Measure for Enhancing ATM Security in Indian E-Banking System	India	The paper introduces three factor authentication metrics in Biometric Strategy Measure for enhancing ATM Security. Author has proposed a combined technique i.e. ATM ID number, PIN number, and biometric fingerprint.	The result identifies a high level model for the modification of existing ATM systems using both security protocols as PIN & Biometric fingerprint strategy. We have been able to develop a fingerprint mechanism as a biometric measure to enhance the security features of the ATM for effective banking transaction for Indian E-banking system so the rate fraudulent reduced on ATM machine.
12	S.T. Bhosale, Dr. B. S. Sawant	2012	Security in E-banking via Cardless Biometric ATMs	India	The paper focused on to provide high security of authentication and unauthorized access of data by using biometric identification (Thumb/ Iris/Finger prints etc.) This research is only for the rural farmers, and semi-literate peoples	The results summarized indicate that there various attacks are generated and e-banking could suffer due to these attacks. A proper defense has been given to avoid these attacks.
13	Zachary, Nelson and Dr. Wanyembi,	2012	Security and Privacy of Electronic Banking	India	The study is focused on the drivers of e-banking and various perspective and different attack of e-banking with their solutions	They found that to avoid e-banking attacks a proper defense should be in place like Education, Personal Firewalls, Secure Socket Layer, Server Firewalls and Password policies.
14	SyedaFarhaShazmeen, Shyam Prasad	2012	A Practical Approach for secure Internet Banking Based on Cryptography	India	The study describes the current online banking problem and discusses the need for security testing for online bank/Internet Banking based on Cryptography.	The solutions to the security issues require the use of software based solutions that involve the use of International Data Encryption Algorithm (IDEA) algorithm using symmetric key algorithm and work is done for encryption decryption cryptography process of online transaction
15	SaadDarwish, Hassan	2012	A Model to Authenticate Request for Online Banking Transactions	India	Paper presents a modified model to authenticate clients online banking transactions through utilizing Identity Based mediated RSA(IB-mRSA) technique in	Author introduced new system, which exploits a method for splitting private keys between the client and the Certification Authority (CA) server and contributed to

					conjunction with the one-time ID concept for the purpose of increasing security and preventing reply attacks	create the attractive features of IB-mRSA protocol with one time ID based DoS (Denial of Services) presentation technique to authenticate request for online banking transactions
16	M. Anand Kumar and Dr.S.Karthikeyan	2012	Investigating the Efficiency of Blowfish and Rejindael (AES) Algorithms	India	This mainly focuses on two frequently used symmetric <i>encryption</i> algorithms such as Blowfish and Rejindael. The cryptographic algorithm is divided into three types: Secret Key Cryptography (SKC), Public Key Cryptography (PKC) and Hash Functions	The results found that algorithms were tested with different performance metrics and result shows that Blowfish has better performance than AES is almost all cases. So Blowfish could be used looking at the performance aspect but AES has to be used in case of high security
17	KandeArchana and Dr.A .Govardhan	2012	Enhance the Security in the ATM System with Multimodal Biometrics and Two-Tier Security	India	The use of Biometric cryptosystem scheme namely fuzzy vault and fuzzy commitment is used to defend the pattern which is extracted from the Multimodal biometrics and Two-Tier Security	The result shows that Multimodal biometrics along with two-tier security provides a higher level of security
18	Tejinder Pal Singh Brar, Dr. Dhiraj Sharma, Dr. Sawtantar Singh Khurmi	2012	Vulnerabilities in e-banking: A study of various security aspects in e-banking	India	The paper study various tools which helps in the eradication of the internet banking risk and could be highly reduced if the internal control measure techniques were adequately put in place.	The result found that to avoid online attacks SMS challenge code and PKI based hardware token methods adopted.
19	Dr. Komal and Dr. Vandna Rani	2012	Progress of Banking in India: Customers Perspectives	India	The aim of this paper to analyze the present e-banking scenario concerned with ATM, Internet banking, Mobile banking and Credit cards in India and the impact of it.	Result found that the e-banking products, CSL of ATM is peak and the number of users of ATM is also top as associated to other services. Internet banking and credit card are at second and third position as far as CSL is concerned

20	PremKishan, Vishwanath, et.al	2013	Real Time SMS-Based Hashing Scheme for Securing Financial Transactions on ATM Terminal	India	Author contribution is to increase the security of ATM machine for the customer authentication for Securing Financial Transactions on ATM Terminal.	The study shows the designing part hardware design and software design both were designed by the rules of embedded system
21	SusmittaMandal	2013	Review on Secured Money Transactions with fingerprint Technique in ATM System	India	The paper gives the Review on Secured Money Transactions with Fingerprint Technique in ATM System	The analysis reveals the existing system of ATM machine is improved by using fingerprint technique for secured money transactions
22	Citation Babatunde and Charles A O	2013	A Finger print based Authentication Framework for ATM Machine	India	This study verifies the use of fingerprints in the formulation of very strong and reliable system for ATM users Identification and verification.	The findings are that the 3 tier structure for system verification, Backend database and System transaction performance. on ROC curve and the recorded values for the ERR indicates that the proposed system is good for providing strong method for checkmating the activities of intruders as well as providing smooth access to the genuine users.
23	Ibidapo, Akinyemi	2013	Towards Designing a biometric Measure for Enhancing Security in Nigeria E- banking system	Nigeria	The present paper examines the vulnerabilities and the increasing wave of criminal activities occurring at ATM (Automated Teller Machine).	The research is being carried out for the sole purpose of designing three factors, authentication metrics, i.e. the ATM ID number, the PIN number and Biometric feature (fingerprints). The study found that to elaborate the security feature for enhancing the ATM was designed using the client/ server approach
24	R. Melba Kani Dr. A. Merlin Thanga Joy	2013	Issues and Challenges Faced by ATM Customers of State Bank of India In South Tamilnadu	India In South Tamilnadu	The study aims at identifying the issues and challenges faced by customers. The paper highlights ATM services most preferred by customers as well as the awareness level and problems faced by customers regarding ATM services.	The research found that ATM services of SBI South Tamilnadu were well received and utilized by the customers. It was revealed withdraw in cash through ATM was very convenient and majority of the respondents had used ATM services regularly. With regard to purpose more weightage was given to 'withdrawal' facility of ATM.
25	SunitaBishnoi	2013	An Empirical Study of Customers Perception Regarding Automated	India	The present study has made an attempt to find out the awareness of customers concerning various issues related to	The research concludes that ATM is a very expedient and has any time anywhere usage. A survey of 220 respondents who are using

			Teller Machine In Delhi and NCR		ATM/Debit cards and the demographic relations among various issues are also highlighted.	ATM services has been conducted and the collected data was studied with the help of SPSS by using applicable statistical techniques
26	DeepaMalviya	2014	Face Recognition Technique: Enhanced Safety Approach for ATM	India	The objective of this paper is security approaches of ATM have been attentive on, and has been enriched using biometric based authentication technique i.e. face recognition from 3 angles	The result indicates that the strengthened biometric ATM system that will be a defending approach in coming year and will increase the sureness of customer's in banking sector.
27	A.Salma et al	2014	Smart Card for Banking with Highly Enhanced Security System	India	Present paper examines the every customer has an individual ATM card for each and every bank in which they maintain an account.	The result, proposes framework for user identification and authentication in Automatic Teller Machine (ATMs) using Personal Identification Number (PIN) and Fingerprint identification. In addition with a GSM founded security system for ATM machine is provided to avoid theft of money and other illegal happenings in ATM machine. The security system automatically would send information to the nearby police station in such situations
28	CH. Krishna Prasad et al	2014	Data Encryption Methods Used in Secure ATM Transactions	India	The paper study on different data encryption methods which are used in Secure ATM Transactions. And study the comparisons between AES & triple DES encrypted algorithms.	The result found that AES able to process six times faster compared with the triple DES for the same processing capacity. When compared with AES, triple DES implementation is felt more suitable for application on the device hardware, such as network system communications, VPN network devices or at an ATM.

29	EmekaNwoguMcCh esterOdoh	2015	Security Issues Analysis on Online Banking Implementations in Nigeria	Nigeria	The paper highlighted the stages of internet banking with a detailed analysis of their security needs and related issues. A particular reference was made on the attacks and weaknesses in the current systems.	The study found that the attacks that have been seen in the Nigerian online banking platform. It has highlighted the threats and vulnerabilities that are established on Internet banking systems. Findings reveal a lot more needs to be done to protect customers from the activities of these ever hardworking attackers.
30	Dr.HarshitaBhatnagar	2015	Awareness and Adoption of Technology in Banking Especially by Rural Areas Customers: A Study of Udaipur Rural Belt	India	The objective of this paper is to study awareness of technology, analyses adoption and usage pattern and the impact of familiarity on internet use on awareness and usage of technology base banking services among rural area customers.	The result found that study is very relevant and very helpful to determining awareness and adoption of technology based banking services among rural customers for Demographic, Awareness, Awareness and Demographic, Usage level.

1.2 Objectives

The present paper primarily aims to study the impact of existing transaction authentication process and added more authentication methods to implement additional security. The main objectives of the paper are to:

1. To study the new security methods provided by using three factor authentication processes (By using RSA and AES128 Algorithms), which have been implemented for safe and secure ATM as well as online transaction.
2. To analyze the technical problems in existing online banking tools like Internet banking and ATMs.
3. To analyze the problems faced by the customers in internet banking
4. To study Hardware token and security constraint for any amount transaction implemented through new security methods and usage of e-payment techniques.

1.3 Impact of E-banking on Payment and ATM System

To know the impact of e-banking on payment and ATM system, the response of customers has been also taken into account. An attempt has been made to know the satisfaction of the customers regarding e-payment/ATM system. The system has been beneficial in handling large volume of business payment/ remittances. It also provides alternative for faster delivery of banking services acceptable to wide range of customers.

1.4 Conclusion

Authors has studied the number of literatures / Research reviews currently carried out by stated references to get an idea about the research done in various areas of online banking security system. The objective of this study was to understand the online banking system, ATM system, the different methods implemented for the security on the online transactions and the security implemented by using various Biometric methods and algorithms..

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30. Dr. HarshitaBhatnagar ,Pacific Business Review International, Volume 7, Issue 11, May 2015 Awareness and Adoption of Technology in Banking Especially by RuralAreas Customers: A Study of Udaipur Rural Belt