



An Evaluative Study on Internet Banking Security among Selected Indian Bank Customers

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Abstract

In the current scenario, usage of Internet has revolutionized the entire banking system. People can bank anytime, anywhere without having the need to visit the bank branch. This helps customers in saving time by completing work at the click of the button. Although, Internet banking is very convenient and fast, it is mired with several security issues. Banking institutions have taken several measures to ensure safety measures for their customers while performing various transactions online. In this context, an effort has been made to inspect and evaluate the Internet banking security measures followed by the selected bank, Indian Bank, in Coimbatore district, for the benefit of its customers. The present study is carried out with the help of a suitable research instrument. 50 customers were selected and with the help of their responses, analysis is made followed by few suggestions.

Keywords: Internet Banking, Mobile Banking, Internet Security

JEL Classification: G21, M30

Paper Classification: Research Paper

Introduction

India has third largest internet population in the world after China and United States and presents unmatched developmental prospect for the internet segment in coming years. The banking sector is one of the major beneficiaries of the Internet revolution and the growth of banking technology products have been remarkably increasing. The prevalent gain of Internet banking is that people can pay out the services sitting at home, without visiting the branch. This helps customers to complete their transactions in the fraction of time, thus saving both time and effort. Internet banking system proves to be very versatile in completing transactions like balance inquiry, withdrawal, deposits, viewing the bank statement, and record of recent transaction. Considering all the advantages, security of the financial information of customers is a very major concern of all banks.

Review of Literature

Several studies bring out the importance of security in Internet banking. Broderick and Vicharapornpuk (2002) studied the importance of customer role in designing and providing quality service in Internet banking. Guraau (2002) analyzed the state of affairs of online banking and its services. The study also pays attention more towards the virtual banking system. Karjaluo, Mattila, and Pentto (2002) made an attempt to determine those factors that influence the formation of consumer attitude toward electronic banking. Hutchinson and Warren (2003) studied the financial service of electronic commerce, Internet Banking and its benefits to the customers. In the study, internet banking security measures and various techniques for privacy of customers' data has been discussed. Rotchanakitumnuai and Speece (2003) in their research work found that corporate customers do not accept electronic form of banking, which can assist banks to implement this self-service technology more efficiently in the various banking transactions. Lympero and Chaniotakir (2004) evaluated the allusion of Internet – banking technology and the existence of different distinct factors which affect the market. Li and Worington (2004) in their working paper described linkage between internet banking and electronic activities in the business and industrial events.

Pikkarainen, Pikkarainen, Karjaluo, and Pahnla, (2004) highlighted that electronic banking know-how had created newer usages of banking especially via online banking direct methodology. The authors adopted technology approval model to control the online environment. Singh (2004) in his study examined the collision of online banking and internet banking trends. The study also concentrated on the latest banking technology products and services for the economic growth. Gupta (2006) in his study analyzed the potential of Internet banking and found that its capability to reach each and every cranny and gap of the world holds great significance for a realm like India. Flavián, Guinalú, and Torres (2006) explored how customers' sensitivity of conventional bank guided them to take up the services of the internet. The researchers found that if the customer trusted the traditional bank then it was feasible that they feel more forced to use the online services offered by the same bank. Lichtenstein and Williamson (2006) explained the factors that influence the consumer decision, to choose internet banking services in the Australian context. Ndubisi and Sinti (2006) discussed the impact of internet banking on customers' stance, their needs and activities. The intent of the study was to see the internet banking adoption in Malaysia.

Abu-Shanab and Pearson (2007) investigated the key determinants of the adoption of internet banking in Jordan. Kamakodi and Khan (2008) found an exemplar shift in the Indian banking services in about 15 years since the Indian banking sector was liberalized. Uppal (2008) described that the Post – LPG (liberalization, privatization and globalization) era and information technology (IT) era, revolutionalized the face of Indian banking, as banks are stepping towards e-banking from traditional banking. Lifan, Zhao, Koenig-Lewis, Hanmer-Lloyd, and Ward (2010) in their study explained the roles of reliance and perceived the risk on client's/customer's usage purpose. Khare (2010) in his study described the importance of technology in civilizing customer service levels in being used deliberately and progressively more by service organizations.

There are substantial amount of studies conducted at the Indian level and international level but, very few works have focused on the Internet banking, its usage, safety measures and its perceptions, attentiveness level, satisfaction levels, attitudes and behavior of the internet banking, security issues, and financial frauds. Additionally, studies relating to the Internet banking security specifically in the Southern Region of Tamil Nadu are extremely limited. The present study is an attempt to bridge this research gap by studying Internet banking security among the selected Indian Bank customers.

Statement of Problem

In the present state of affairs, the banking sector has been seen a mammoth progress and the popularity with respect to the Internet banking services and its products. This development has led to the large number of internet banking transactions, which are faster and more convenient mode of transactions, for the bank customers. Banking industry is one of the businesses that have used the full potential of IT to help with banking transactions and increase banking services and opportunities to its customers. These facilities helped millions of customers to perform their transaction anytime anywhere easily, quickly and smoothly with perfections. However to carry out banking transactions through the Internet, one needs to have some basic knowledge about computers and the Internet, which to some extent, limits the number of people willing to avail this facility. Many people who are not comfortable with computers and the Internet find it difficult to use this service.

Objectives of the Study

The central objectives of the present study are -

1. To analyze the customers' perceptions and awareness towards Internet banking security;
2. To understand the problems faced by customers while using internet banking services; and
3. To know impact of the internet banking securities among the selected customers in Coimbatore.

Scope of the Study

This study provides a guide to the current structure of the Internet banking security and highlights awareness level of customers for using Internet banking, and their perception and satisfaction towards Internet banking with new technologies and its functioning. This helps to know in details about development in banking industry with advancement in technology. It also helps in understanding different services offered in Internet banking. Ultimately this would help in understanding the benefits of Internet banking to customers as well as banking industry.

Research Methodology

Sample Design

The multi-stage sampling technique was adopted for selection of respondents for the study. The customers of Indian Bank, ADU Campus, and Coimbatore were selected in four stages. There are about 1647 Indian Bank branches in India, out of which 710 Indian Bank branches are in Tamilnadu, 37 Indian Bank branches are in Coimbatore, out of the 37 Indian Bank branches, only ADU Campus (Avinashilingam Institute for Home Science and Higher Education for Women) was purposively selected for the study. Sampling Size - In the present study, 50 customers were taken as sample size.

Type of Study and Data

The present study is analytical and exploratory in nature. Accordingly, the data used is both primary as well as secondary. The relevant reports viz., RBI monthly bulletins, Magazines, newspapers, business dailies, books and journals, e-media and other literature available in this field constitute secondary sources for the present study. The awareness of, perception towards, satisfaction of Internet banking security is studied with the help of a structured questionnaire. The

primary data has been collected, through a separate pre-tested Questionnaire from 50 Internet banking customers, in Tamil Nadu division of Coimbatore. The Internet banking users were selected from ADUC Branch, Coimbatore.

Statistical Tools and Techniques

To analyze the collected data, various statistical techniques and tools such as averages, frequency distribution tables, and normal distribution were used. The study also uses other suitable statistical tools such as mean, median, standard deviation with co-efficient of variation, correlation and regression, factor analysis etc. SPSS software package and the IBM – AMOS 20.0 version software were used for the analysis.

Hypothesis of the Study

The major hypotheses of the study are as follows:

H₀₁: Internet banking has no significant relationship with traditional banking system.

H₀₂: Internet banking security has no significant impact on the customers

Analysis and Interpretations

Table 1: Socio-Economic Profile of Internet banking customers, Coimbatore

S. No.	Category	Description	Gender		No. of Respondents	(% of Respondents)
			Male	Female		
01.	Age	20-30	16	09	25	50
		31-40	07	08	15	30
		41-50	02	04	06	12
		51-60	03	-	03	06
		60 and above	01	-	01	02
TOTAL			29	21	50	100
02.	Gender	Male	29	-	29	58
		Female	-	21	21	42
TOTAL			29	21	50	100
03.	Qualification	Up to SSLC	04	-	04	08
		PUC	02	04	06	12
		Graduate	09	08	17	34
		Post Graduate	06	06	12	24
		Professional Degree	08	03	11	22
TOTAL			29	21	50	100
04.	Occupation	Agriculturist	-	01	01	02
		Business	11	03	14	28
		Professional	02	03	05	10
		Employee in Public Sector	05	01	06	12
		Employee in Private Sector	08	08	16	32
		Student	02	05	07	14
		Retired Employee	01	-	01	02
TOTAL			29	21	50	100

(Continued...)

05.	Monthly Income	Below 10,000	02	06	08	16
		10,000-20,000	08	06	14	28
		20,000-30,000	12	05	17	34
		30,000-40,000	03	03	06	12
		40,000-50,000	02	01	03	06
		50,000-1,00,000	01	-	01	02
		1,00,000 and above	01	-	01	02
TOTAL			29	21	50	100
06.	Marital Status	Single	17	10	27	54
		Married	12	11	23	46
TOTAL			29	21	50	100
07.	Family Members	Up To 3	07	05	12	24
		4-6	21	14	35	70
		6 and above	01	02	03	06
TOTAL			29	21	50	100
08.	Type Of Account	Savings A/C	17	19	36	72
		Current A/c	12	02	14	28
TOTAL			29	21	50	100

Table 1 above shows the socio-economic profile of the selected Internet banking users in Coimbatore. 50% of the customers in the age group of 20 – 30 in Coimbatore district use Internet banking. Out of this, 58% are males. It also clear that graduates are more likely to use Internet banking; 32% of customers of Internet banking work in private organizations. 34% of Internet banking users is from middle income group. Majority of Internet Banking Users are Single at 54% and 72% of savings account holders in the bank use Internet banking facilities.

Table 2: Internet Banking Awareness Level of Indian Bank Customers, Coimbatore

S. No.	Become Aware through various Modes	No. of Respondents	Percentage of Respondents
01.	Advertisement	16	32
02.	News Paper	04	08
03.	Parents	04	08
04.	Relatives	06	12
05.	Television	05	10
06.	Friends	06	12
07.	Bankers	09	18
	TOTAL	50	100

Table 2 indicates that Internet banking awareness level of Indian Bank customers, Coimbatore. It shows that 32% of the people were aware about Internet banking facility through advertisement; it also reveals that 18% of the people in Coimbatore are aware of Internet banking through bankers. 8% of the customers become aware of Internet banking through newspapers and parental influence; 12% become aware because of relatives and friends; and 10% through television.

Table 3: Awareness Level of Internet Banking Security among the Selected Customers of Indian Bank, ADU Campus

Sl. No.	Types of Security /Protection Mode	SA		A		N		D		SD	
		No	%	No	%	No	%	No	%	No	%
01.	Security Code	19	38	21	42	05	10	03	06	02	04
02.	Password protection	23	46	21	42	05	10	01	02	00	00
03.	Transaction Security	14	28	20	40	09	18	05	10	02	04
04.	Confidentiality	06	12	12	24	07	14	15	30	10	20
05.	Authentication Security	04	08	09	18	10	20	16	32	11	22
06.	Hardware Security	05	10	09	18	08	16	14	28	14	28
07.	Database Security	09	18	16	32	02	04	12	24	11	22
08.	Memory Protection	07	14	20	40	04	08	13	26	06	12
09.	File Security	10	20	22	44	06	12	05	10	07	14

(Note: SA – Strongly Agree, A – Agree, N – Neutral, D – Disagree, SD – Strongly Disagree)

Table 3 indicates the awareness level of Internet banking security among the selected customers in ADU campus. It is reveals that 42% of respondents are aware of security code for using Internet banking; 46% of the respondents are aware of password protection; 40% are aware of transaction security; 24% of the people are aware of confidentiality security; 18% are aware of hardware security; 32% of the respondents are aware of database security; 40% are aware of memory protection; and 44% of respondents are aware of file security. It shows that maximum customers are aware of password protection security.

Table 4: Benefits of Traditional Banking System

S. No.	Banking Services / Facilities	SA		A		N		D		SD	
		No	%	No	%	No	%	No	%	No	%
1.	Interaction with Banker	07	14	21	42	02	04	18	36	02	04
2.	Easy Deposit and Withdrawal	03	06	12	24	04	08	22	44	09	18
3.	Collection Of Cheque	08	16	22	44	01	02	13	26	06	12
4.	Demand Draft	14	28	25	50	01	02	09	18	01	02
5.	Security	10	20	32	64	03	06	04	08	01	02
6.	Security Lockers	17	34	20	40	02	04	06	12	05	10

Table 4 indicates that benefits of traditional banking system. It is reveals that 42% of the respondents agree with the benefits of interaction with banker; 44% of the respondents disagree with the benefits of easy deposit and withdrawal; 44% of the respondents agree with the benefits of collection of cheque; 50% of the respondents agree with the benefits of demand draft; 64% of the people agree the benefits of security; and 40% of the respondents agree with the benefits of

security lockers. It is observed that maximum people benefitted from the secure traditional banking.

Table 5: Benefits of Internet Banking System

S. No.	Internet Banking Benefits	SA		A		N		D		SD	
		No	%	No	%	No	%	No	%	No	%
1.	Time Saving	47	94	03	06	-	-	-	-	-	-
2.	Any Time Banking	41	82	09	18	-	-	-	-	-	-
3.	Any Where Banking	39	78	09	18	02	04	-	-	-	-
4.	Easy Accessibility	38	76	10	20	02	04	-	-	-	-
5.	No Queue	14	28	36	72	-	-	-	-	-	-
6.	Ease of Monitoring	05	10	33	66	09	18	03	06	-	-
7.	Friendlier Rates	05	10	11	22	08	16	25	50	01	02

(Note: SA – Strongly Agree, A – Agree, N – Neutral, D – Disagree, SD – Strongly Disagree)

Table 5 indicates benefits of Internet banking system. It reveals that 94% of the respondents strongly agree with the benefits of time saving; 82% of the respondents strongly agree with the benefits of any time banking; 78% of the respondents strongly agree with the benefits of anywhere banking; 76% of the respondents strongly agree with the benefits of easy accessibility; 72% of the respondents agree with the benefits of no queue; 66% of the respondents agree with the benefits of ease of monitoring; and 50% of the respondents disagree the benefits of friendlier rates. It is observed that maximum respondents benefitted due to time saving through Internet banking.

Table 6: Usage of Internet Banking Services

S. No.	Usage of Internet Banking Services	SA		A		N		D		SD	
		No	%	No	%	No	%	No	%	No	%
1.	Secured Transaction	-	-	02	04	03	06	25	50	20	40
2.	Quick Settlement	21	42	28	56	01	02	-	-	-	-
3.	Electronic Fund Transfer	13	26	33	66	02	04	02	04	-	-
4.	Electronic Clearing Services	12	24	31	62	03	06	04	08	-	-
5.	Electronic Payment Services	11	22	22	44	02	04	11	22	04	08
6.	National Electronic Fund Transfer	16	32	24	48	04	08	03	06	03	06
7.	Real Time Gross Settlement	11	22	25	50	06	12	04	08	04	08
8.	Core Banking System	03	06	13	26	02	04	17	34	15	30

(Note: SA - Strongly Agree, A - Agree, N - Neutral, D-Disagree, SD – Strongly Disagree)

Table 6 indicates the usage of Internet banking services. It observes 50% of respondents disagree with the usage of secured transaction; 56% of respondents agree with the usage of

quick settlement; 66% of respondents agree with the usage of electronic fund transfer; 62% of respondents agree the usage of electronic clearing services (ECS); 44% of respondents agree the usage of electronic payment service; 48% of respondents agree the usage of national electronic fund transfer; 50% of respondents agree with the usage of real time gross settlement (RTGS); 34% of respondents disagree with the core banking system. It is concluded that maximum respondents accepted the usage of electronic fund transfer.

Table 7: Factors Influencing the Internet Banking Facility

S. No.	Description	SA		A		N		D		SD	
		No	%	No	%	No	%	No	%	No	%
1.	Convenience	43	86	07	14	-	-	-	-	-	-
2.	Friends / Relatives Advice	31	62	18	36	-	-	01	02	-	-
3.	Personality of Bank Manager	05	10	34	68	07	14	04	16	-	-
4.	Popularity Of Banks	07	14	36	72	07	14	-	-	-	-
5.	Quality Of Service	07	14	34	68	06	12	03	06	-	-

(Note: SA - Strongly Agree, A - Agree, N - Neutral, D - Disagree, SD - Strongly Disagree)

Table 7 shows the factors influencing the Internet banking facilities. It shows that 86% of respondents strongly agree with the influencing factor of convenience; 62% of respondents strongly agree with the factor of friends and relatives; 68% of respondents strongly agree with the factor of personality of bank manage; 72% of respondents strongly agree with the factor of popularity of banks; 68% of respondents strongly agree with the factor of quality of services. It is clear that most of the respondents are influenced by the factor of convenience.

Table 8: Internet Banking Users by Application of Various Browsers

S. No.	Type of Browser	MP		P		MLP		LP		NAP	
		No	%	No	%	No	%	No	%	No	%
1.	Internet explorer	02	04	03	06	05	10	33	66	07	14
2.	Google Chrome	05	10	28	56	03	06	12	24	02	04
3.	Mozilla Firefox	41	82	08	16	-	-	01	02	-	-
4.	Opera	01	02	09	18	01	02	33	66	06	12
5.	Netscape	01	02	03	06	03	06	22	44	21	44
6.	Safari	-	-	-	-	11	22	02	04	37	74

(Note: MP - Most Preferred, P - Preferred, MLP - Most Likely to Preferred, LP - Least Preferred, NAP - Not At All Preferred)

Table 8 indicates various browsers used by internet banking customers. It shows that the least preferred browser was Internet Explorer with 66% not preferring it. 56% of the respondents preferred the Google chrome; whereas 82% of the respondents most preferred the Mozilla Firebox; Opera and Netscape were the least preferred browsers, whereas Safari was not preferred at all. It is clear that most preferred browser for Internet banking was Mozilla Firefox.

Table 9: Operating System Used for the Internet Banking Transaction and Security

S. No.	Type of Operating System	MP		P		MLP		LP		NAP	
		No	%	No	%	No	%	No	%	No	%
1.	Window7	17	34	29	58	02	04	01	02	01	02
2.	Window8	11	22	28	56	01	02	10	20	-	-
3.	Linux Mint	04	08	13	26	05	10	25	50	03	06
4.	Linux Live CD	02	04	07	14	02	04	19	38	20	40
5.	Mac	15	30	10	20	01	02	08	16	16	32
6.	Ubuntu (Operating system for Desktop)	02	04	01	02	03	06	31	62	13	26
7.	Windows XP Professional	11	22	28	56	03	06	06	12	02	04
8.	Macintosh OSX	-	-	-	-	-	-	25	50	25	50
9.	Windows 8.1	03	06	09	18	02	04	16	32	20	40
10.	Windows XP	36	72	12	24	-	-	02	04	-	-
11.	Fedora	01	02	08	16	05	10	19	38	17	34
12.	Android	05	10	04	08	10	20	15	30	16	32

(Note: MP – Most Preferred, P – Preferred, MLP – Most Likely to Preferred, LP – Least Preferred, NAP – Not At All Preferred)

Table 9 indicates the various operating systems of Internet banking transaction and security. It shows that 58% of respondents prefer to use Windows 7 and 56% of respondents prefer to use Windows 8. It was found that Linux Live CD, Mac, Macintosh OSX, Android and Windows 8.1 operating systems were not at all preferred by the respondents; including Linux Mint, Ubuntu and Fedora, which were least preferred. 72% of the respondents most preferred to use Windows XP. It is clear most of the respondents preferred to use windows XP.

Table 10: Operating System updating and Security Patches

S. No.	Category	Gender		No. of Respondents	Percentage (In %)
		Male	Female		
1.	Yes	20	15	35	70
2.	No	07	04	11	22
3.	Can't say	02	02	4	8
Total		29	21	50	100

Table 10 indicates updating and security patches of operating system. It reveals that 70% of the respondents are aware of updating with security patches. However, 22% of the respondents are not aware of the same.

Table 11: Anti-Malware Preference tools for using Internet Banking Security

S. No.	Type of Anti-Malware	MP		P		MLP		LP		NAP	
		No	%	No	%	No	%	No	%	No	%
1.	Anti-Virus	17	34	18	36	04	08	08	16	03	06
2.	Firewall	20	40	27	54	-	-	03	06	-	-

(Continued...)

3.	Anti – Spyware	08	16	07	14	05	10	10	20	20	40
4.	Spyware Blaster	07	14	03	06	02	04	20	40	18	36
5.	AVG Anti Root kit	01	02	04	08	01	02	09	18	35	70
6.	Comodo Firewall Pro	02	04	05	10	20	40	-	-	23	46
7.	Windows Defender	-	-	06	12	03	06	19	38	22	44
8.	Malicious Software	04	08	06	12	10	20	19	38	11	22
9.	McAfee Virus	05	10	11	22	01	02	19	38	14	28
10.	Microsoft Security	05	10	09	18	07	14	11	22	18	36

(Notes: MP - Most Preferred, P – Preferred, MLP – Most Likely to Preferred, LP – Least Preferred, NAP – Not At All Preferred)

Table 11 indicates the various anti-malware tools of Internet banking security. It shows that 36% of the respondents prefer to use anti – virus and 54% of the respondents prefer to use firewall. It was found that respondents least preferred to use Spyware Blaster and not at all preferred to use AVG anti-root kit, Comodo Firewall and Windows Defender. It is clear that most of the respondents prefer to use some type of firewall.

Table 12: Frequency of Internet Banking Transaction

S. No.	Category	No. of respondents	Percentage (in %)
1.	Occasionally	13	26
2.	Frequently	33	66
3.	Never	03	06
4.	Very Often	01	02
Total		50	100

Table 12 indicates that frequency Internet banking transactions. It shows that, 26% of the respondents occasionally use the Internet banking; 66% of the respondents frequently use the Internet Banking; 6% of the respondents never using the Internet Banking; and 2% of the respondents very often to use Internet Banking.

Table 13: Frequency of changes in the Internet banking password

S. No.	Category	No. of respondents	Percentage (%)
1.	Monthly	22	44
2.	Quarterly	15	30
3.	Half Yearly	11	22
4.	Yearly	02	04
Total		50	100

Table 13 indicates frequency of changes in the Internet banking password. It shows that 44% of the respondents change their password monthly; 30% of the respondents change passwords quarterly; 22% of the respondents change passwords half yearly; 4% of the respondents change passwords on yearly basis. It is concluded that maximum respondents changing our password in monthly basis.

Table 14: Purpose for Using Internet Banking Services among the Selected Customer

S. No.	Description	SA		A		N		D		SD	
		No	%	No	%	No	%	No	%	No	%
1.	Online Ticket Booking	37	74	11	22	02	04	-	-	-	-
2.	Online Bill Payment	37	74	09	18	03	06	01	02	-	-
3.	Balance Enquiry	36	72	11	22	03	06	-	-	-	-
4.	Request for Cheque Book	02	04	06	12	09	18	18	36	15	30
5.	Income Tax/TDS Payment	09	18	22	44	07	14	10	20	02	04
6.	Service Tax/Central Excise	11	22	17	34	07	14	13	26	02	04
7.	Insurance Premium Payment	02	04	11	22	06	12	23	46	08	16
8.	Online Shares Trading	09	18	10	20	07	14	15	30	09	18
9.	TNEB Payments	27	54	15	30	04	08	04	08	-	-
10.	Online Shopping	28	56	19	38	-	-	03	06	-	-

(Note: SA – Strongly Agree, A – Agree, N – Neutral, D – Disagree, SD – Strongly Disagree)

Table 14 indicates the purpose for using Internet banking services. It shows that 74% of the respondents use Internet banking for online ticket booking; 74% of the respondents use Internet banking for online bill payment; 72% for balance enquiry; 44% for Income Tax Payment; 54% for TNBE Payments; and 56% for online shopping. It was also found that respondents do not use Internet banking for insurance premium payment and online shares trading. It is observed that maximum respondents use Internet banking for online ticket booking and online bill payment.

Table 15: Technical Problems and Difficulties While Using Internet Banking Facility

S. No.	Description	SA		A		N		D		SD	
		No	%	No	%	No	%	No	%	No	%
1.	Hacking Attacks	10	20	25	50	04	08	06	12	05	10
2.	Phishing	15	30	25	50	03	06	03	06	04	08
3.	Malware	12	24	19	38	06	12	07	14	06	12
4.	Illegal Activities	04	08	13	26	08	16	14	28	11	22
5.	Transaction Activities	05	10	11	22	01	02	08	16	25	50

(Note: SA – Strongly Agree, A – Agree, N – Neutral, D – Disagree, SD – Strongly Disagree)

Table 15 indicates that technical problems and difficulties faced while using Internet banking. The following are the problems faced by the respondents: 50% - hacking attacks, 50% - Phishing attacks, 38% - Malware. It is concluded that maximum respondents face the problems of hacking attacks and phishing.

Testing of the Hypothesis

Test of Hypothesis – I

H_{01} : Internet banking has no significant relationship with traditional banking system.

Table 16: Correlation between Internet Banking and Traditional Banking

Correlations														
Descrip-tion	Correla-tions	IWB	Dw	CC	DD	secu-rity	SL	TS	ATB	AWB	EA	NQ	EM	FR
IWB	Pearson Correlation	1	0.52	-0.81	-.261	.039	.104	-.086	-.203	-.212	-.021	-.061	.014	.208
	Sig. (2-tailed)		.721	.578	.067	.787	.472	.553	.158	.139	.886	.674	.921	.147
DW	Pearson Correlation	.052	1	-.029	.099	-.034	.353*	.048	-.128	-.023	-.222	-.031	-.346*	-.101
	Sig. (2-tailed)	.721		.843	.492	.816	.012	.743	.375	.874	.121	.830	.014	.483
CC	Pearson Correlation	-.081	-.029	1	.015	.157	.071	-.141	-.026	-.018	.138	.012	.209	.008
	Sig. (2-tailed)	.578	.843		.917	.275	.625	.328	.858	.902	.341	.933	.145	.957
DD	Pearson Correlation	-.261	.099	.015	1	-.077	-.239	.040	.123	.209	.339*	-.155	-.069	-.304*
	Sig. (2-tailed)	.067	.492	.917		.593	.094	.781	.395	.145	.016	.284	.633	.032
Security	Pearson Correlation	.039	-.034	.157	-.077	1	-.052	-.120	.077	-.090	.229	.109	.140	.032
	Sig. (2-tailed)	.787	.816	.275	.593		.718	.405	.596	.534	.110	.452	.333	.825
SL	Pearson Correlation	.104	.353*	.071	-.239	-.052	1	-.111	-.286*	-.121	-.246	.149	-.053	.191
	Sig. (2-tailed)	.472	.012	.625	.094	.718		.443	.044	.403	.086	.302	.714	.184
TS	Pearson Correlation	-.086	.048	-.141	.040	-.120	-.111	1	.539**	.520**	.254	-.030	.170	-.105
	Sig. (2-tailed)	.553	.743	.328	.781	.405	.443		.000	.000	.075	.836	.237	.467
ATB	Pearson Correlation	-.203	-.128	-.026	.123	.077	-.286*	.539**	1	.764**	.317*	.176	.015	-.243
	Sig. (2-tailed)	.158	.375	.858	.395	.596	.044	.000		.000	.025	.221	.918	.089
AWB	Pearson Correlation	-.212	-.023	-.018	.209	-.090	-.121	.520**	.764**	1	.274	.140	.133	-.266
	Sig. (2-tailed)	.139	.874	.902	.145	.534	.403	.000	.000		.054	.332	.358	.062
EA	Pearson Correlation	-.021	-.222	.138	.339*	.229	-.246	.254	.317*	.274	1	-.298*	.504**	.056
	Sig. (2-tailed)	.886	.121	.341	.016	.110	.086	.075	.025	.054		.036	.000	.697
NQ	Pearson Correlation	-.061	-.031	.012	-.155	.109	.149	-.030	.176	.140	-.298*	1	-.334*	-.136
	Sig. (2-tailed)	.674	.830	.933	.284	.452	.302	.836	.221	.332	.036		.018	.347

(Continued...)

EM	Pearson Correlation	.014	-.346*	.209	-.069	.140	-.053	.170	.015	.133	.504**	-.334*	1	.445**
	Sig. (2-tailed)	.921	.014	.145	.633	.333	.714	.237	.918	.358	.000	.018		.001
FR	Pearson Correlation	.208	-.101	.008	-.304*	.032	.191	-.105	-.243	-.266	.056	-.136	.445**	1
	Sig. (2-tailed)	.147	.483	.957	.032	.825	.184	.467	.089	.062	.697	.347	.001	
* Correlation is significant at the 0.05 level														
** Correlation is significant at the 0.01 level														

(Note: IWB – Interaction with Banker, DW – Deposit and withdrawal, CC - collection of cheque, DD – Demand Draft, SL – Safety Lockers, TM – Time Saving, ATB – Any Time Banking, AWB – Any Where Banking, EA – Easy Accessible, NQ – No Queue, EM – Ease of Monitoring, FR – Friendlier Rates)

The value of Pearson correlation range from -1 to +1 with negative numbers representing a negative correlation (as one variable increases, the other variable decreases) and positive numbers representing a positive correlation (as one variable increases, the other also increases). The closer the value is to -1 or +1 the stronger the association is between the variables. There is a positive relationship between the traditional banking system and Internet banking system. The above results do not show any significant association between traditional and Internet banking system. Therefore, the null hypothesis, H01, is accepted.

Test of Hypothesis – II

H₀₂: Internet banking security has no significant impact on the customers

Table 17: Correlation between Internet Banking Security and its influencing factors

Correlations										
Description	Correlations	SCG	PPS	TS	CS	AS	HS	DS	MPS	FS
SCG	Pearson Correlation	1	-.122	-.046	-.052	.060	-.045	-.039	-.035	-.280*
	Sig. (2-tailed)		.399	.753	.722	.679	.758	.786	.808	.049
PPS	Pearson Correlation	-.122	1	.064	.154	-.183	-.198	-.037	-.145	.139
	Sig. (2-tailed)	.399		.661	.285	.203	.169	.798	.314	.334
TS	Pearson Correlation	-.046	.064	1	.064	-.144	-.251	-.427	-.015	.029
	Sig. (2-tailed)	.753	.661		.661	.318	.079	.002	.920	.840
CS	Pearson Correlation	-.052	.154	.064	1	-.068	-.091	-.266	-.082	-.207
	Sig. (2-tailed)	.722	.285	.661		.637	.529	.062	.573	.148
AS	Pearson Correlation	.060	-.183	-.144	-.068	1	-.166	-.055	-.216	.021
	Sig. (2-tailed)	.679	.203	.318	.637		.248	.704	.132	.887
HS	Pearson Correlation	-.045	-.198	-.251	-.091	-.166	1	.266	.072	.076
	Sig. (2-tailed)	.758	.169	.079	.529	.248		.062	.622	.599
DS	Pearson Correlation	-.039	-.037	-.427**	-.266	-.055	.266	1	.253	-.304*
	Sig. (2-tailed)	.786	.798	.002	.062	.704	.062		.076	.032

(Continued...)

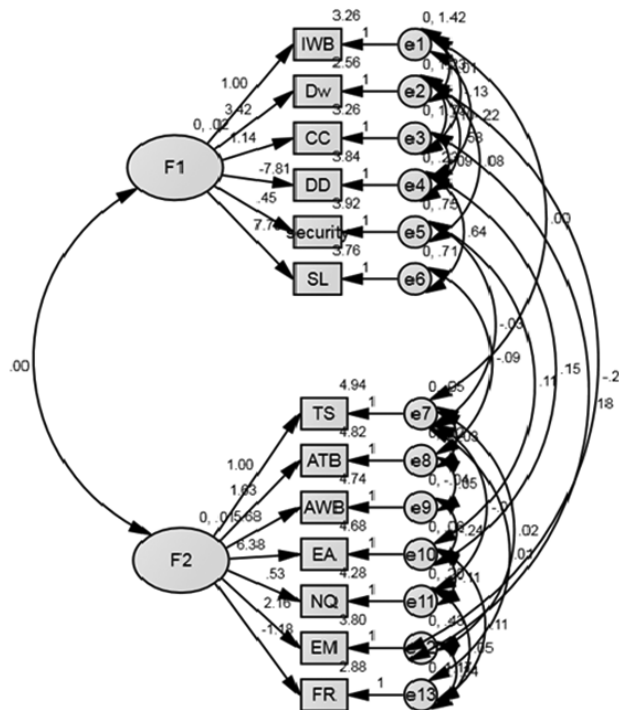
MPS	Pearson Correlation	-.035	-.145	-.015	-.082	-.216	.072	.253	1	-.157
	Sig. (2-tailed)	.808	.314	.920	.573	.132	.622	.076		..277
FS	Pearson Correlation	-.280*	.139	.029	-.207	.021	.076	-.304*	-.157	1
	Sig. (2-tailed)	.049	.334	.840	.148	.887	.599	.032	.277	
* Correlation is significant at the 0.05 level(2 – tailed)										
** Correlation is significant at the 0.01 level (2 –tailed)										

(Note: SCG – Security Code Generators, PPS – Password Protection Security, TS – Transaction Security, CS – Confidential Security, AS – Authentication Security, HS – Hardware Security, DS – Database Security, MPS – Memory Protection Security, FS – File Security)

Results from Table 17 show that there is a significant and negative correlation between SCG and FS. There is also a negative and significant correlation between DS and FS. The above results show that Internet banking security has no significant impact on customers. Therefore, the null hypothesis, H02, is accepted.

Model of the Study

Associate Relationship between Traditional Banking and Internet banking



(Note: F1 =Traditional Banking, F2 = Internet Banking)

Table18: Summary Results of Measurement Model

Model	χ^2	df	P – Value	RMSEA	PGFI/PCFI	NNFI	CFI	RFI	CMIN/DF
H ₁	46.508	39	0.001	0.06	.467	.380	.935	.519	1.193

The Chi-Square (χ^2) value of 46.508 with the 39 degree of freedom is significant at 5% significance level, as its p – value is 0.001. This finding suggests that model fits the data acceptably. Corroborating evidence is provided by the RMSEA fit statistics – the obtained value of 0.008 is less than the cutoff 0.08. Similarly, the Tucker Lewis Index (TLI)/CMIN - DF result of 1.193 is considerably above the 0.95 threshold denoting satisfactory model fit.

The acceptable threshold for the values of GFI, CFI and NFI should be greater than 0.90 and RMSEA are recommended up to 0.05 and acceptable up to 0.08 (Geffen, Straub & Boudreau, 2000). All the measures indicate an acceptable fit and exceed within the common acceptance levels as suggested by Hair et al (2006).

In the above Models F1 and F2 showing the scores observed on traditional banking and Internet banking respectively, causal effects are represented by single-headed arrows in the path diagram. F1 and F2 can be conceptualized as the variance the four indicators share (i.e. what the four indicators have in common). Since the chi – square test of absolute model fit is reported, along with its degrees of freedom and probability value.

Findings of the Study

The major findings of the study is listed below -

1. 32% of the respondents were aware about security issues in Internet banking through advertisement whereas 18% of the respondents were made alert through their bankers.
2. 46% of the respondents were conscious of password protection security whereas 8% of the respondents were only attentive of authentication security.
3. 64% of the respondents believed that traditional banks were more secure whereas 12% of the respondents found the deposit and withdrawal system in traditional banks easy.
4. 94% of the respondents said that Internet banking saved their time and 86% of the respondents accepted that convenience was most influencing factor in using Internet banking.
5. 74% of the respondents were using Internet banking for the purpose of online ticket booking and bill payment.
6. 66% of the respondents used the services of electronic fund transfer in Internet banking.
7. 82% of the respondents use Mozilla Firefox was Internet banking browser and 72% of respondents use Windows XP as operating system.
8. 54% of the respondents use the firewall was Anti - Malware tools in Internet Banking security.
9. 66% of the respondents frequently use the Internet banking transaction and majority of them change their passwords monthly.
10. 50% of the respondents face the problems of hacking attacks and phishing attacks.

Conclusion

To sum up, the current study analyzed the Internet banking customers in the Coimbatore district to understand various aspects of Internet banking services, and the concerns on security measures by the consumers. The outcome of the research work on the Internet banking helped to identify the precautionary checklist open to for a number of issues in the internet banking era. Furthermore, a supreme and powerful security policy employed by the banks and legislation instituted by local or state Governments should be in use and obligatory in order to improve

security in Internet banking systems. In addition, the banks should provide enhanced, new and improved hi-tech security measures such as Internet scam protection, hacking detector and anti-virus protections, etc. These upgrades can provide better discretion to both existing and prospective Internet banking customers.

Limitations of the Study

This study covers select customers of Indian Bank, ADU campus, Coimbatore and was purely based on available primary and secondary data. The sample size for the study was also limited to 50 customers. Further studies could be conducted with bigger sample size, so that results could be generalized.

References

- Abu Shanab, E., & Pearson, J. M. (2007). Internet banking in Jordan: The unified theory of acceptance and use of technology (UTAUT) perspective. *Journal of Systems and Information Technology*, 9(1), 78 – 97.
- Broderick, A. J., & Vachirapornpuk, S. (2002). Service quality in Internet banking: the importance of customer role. *Marketing Intelligence and Planning*, 20(6), 327 – 335.
- Flavián, C., Guinalú, M., & Torres, E. (2006). How brick and mortar attributes affect online banking adoption. *International Journal of Bank Marketing*, 24(6), 406 – 423.
- Gupta, A. (2006). Data Protection in Consumer Internet-Banking. *Journal of Internet Banking and Commerce*, 11, 1.
- Guraau, C. (2002). Online banking in transitional economies: implementation of online banking systems in Romani. *International Journal of Bank Marketing*, 20(6), 285 – 296.
- Kamakodi, N., & Khan, B. A. (2008). Customer and service level in e – banking era: an empirical study. *The ICAI University Journal of Bank Management*, 7(4), 50 – 70.
- Karjaluo, H., Mattila, M., & Pentto, T. (2002). Factors underlying attitude formation towards online internet banking in Finland. *International Journal of Bank Marketing*, 20(1), 261 - 273.
- Khare, A. (2010). Online banking in India: An approach to establish CRM. *Journal of Financial Services Marketing*, 15, 176 – 188.
- Li, & Worington, C. A. (2004). *The relation between adoption of internet banking and electronic connectivity – an international comparison*, (Working Paper No.176), School of Economics and Finance, Queensland University of Technology, Brisbane Australia. Retrieved from <https://core.ac.uk/download/files/153/6524255.pdf>
- Liechtenstein, S., & Williamson, K. (2006). Understanding consumer adoption of internet banking: an interruptive study in the Australia banking context. *Journal of Electronic Commerce Research*, 7(2), 50 – 62.
- Lymperopoulos, C., & Chaniotakir, E. I. (2004). Branch Employee Perception Towards Implication of Internet-banking in Greece. *International Journal of Retail and Distribution Management*, 32(6), 302 – 311.
- Oly-Ndubisi, N., & Sinti, Q. (2006). Consumers Attitudes, Systems Characteristics and Internet Banking Adoption in Malaysia, *Management Research*, 29(1/2), 16 – 27.
- Pikkarainen, T., Pikkarainen, K., Karjaluo, H., & Pahlila, S. (2004). Consumer Acceptance of Online Banking: An Extension of the Technology Acceptance Model. *Internet Research*, 14(3), 224 – 235.
- Rotchanakitumnuai, S., & Speece, M. (2003). Barriers to internet banking adoption: a qualitative study among corporate consumers in Thailand. *International Journal of Bank Marketing*, 21(6/7), 312 – 323.
- Singh, A. M. (2004). Trends in South African Internet Banking. *Journal of New Information Perspective*, 56, 3.
- Uppal, R. K. (2008). Customer Perception of Internet -Banking Services of Indian Banks: Some Survey Evidence. *The ICAI University Journal of Bank Management*, 7(1), 63 – 78.

Warren, M., & Hutchinson, D. (2003). Security for Internet banking: a framework. *Logistics Information Management*, 16(1), 6.

Zhao, A. L., Koenig-Lewis, N., Hanmer-Lloyd, S., & Ward, P. (2010). Adoption of internet banking services in China: is it all about trust? *International Journal of Bank Marketing*, 28(1), 7 – 26.

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