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IMPACT OF INFORMATION TECHNOLOGY IN BANKING- CYBER LAW AND CYBER SECURITY IN INDIA

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ABSTRACT

After 1990, Government of India incepted the liberalization policies over investments. Indian Economy is greatly contributed by Financial Institutions through great improvement in quality of service and efficiency. The present world is driven through technology and the imagination of world without IT in the 21st Century is impossible. Banks also startedup grading technological features in banking service to compete globally in the new era of business. Huge capital pool is done on Technology empowered services like Net Banking, E-Banking, centralized Core Banking, E-Commerce through Plastic Money and Customer Care Services. Banks are under scrutiny to identify the customer need based services to excel in service modules. Banking business in future highly orient to be sustainable by banking everywhere.On the other side, cyber crimes started its origin, which is highly difficult to predict, detect and cure. The very important threat is about the security of the channels, personal data and safety over transactions which are carried out in technology. This paper studies various banking services using information technology, regulation of Information technology in banking and analyses the need for cyber security by depicting the intensity of cyber crimes committed between 2010 to 2013 in India.

Keywords : Economy, Finanacial Institutions, Information Technology, Service, Customers, Cyber Crime

INTRODUCTION

Banks works as a middlemen to mobilize public savings through channelizing the flow of finance and used for productive purpose. Financial sector regulate to push savings as generated energy for economic growth of the country. The banks has to take the leadership in this. The liberalistion channelized a way through business opportunities (Das, 2010). After identification of growth, strategies are formed to mobilize funds. Post Independence speculations were made collectively by Governement and RBI after analyzing the banks role in accelerating banking to achieve the national objectives. After 1990 for two decades banking started adopting technology. Highly competitive market by globalised vision and deregulatory mechanisms enabled companies across the world to compete which emphasized towards greater productivity over costs by investing more on Information Technology (Fredrikson 2003)

Banking shift from the branch banking towards customer retention banking. Previous parameters of efficiency like growth in deposits, mobilization and business are outdated and recent trends like net interest margins, non performing assests, profitability are recognized. According to Kotler and Bloom (1984)service is any tangible benefit offered by one without its ownership and its production may not be related to a physical product. The efficiency of banking rests on the extent to which it can deliver services with customer satisfaction hence there is a need to sustainable improvement in its service patterns. With the advancement of science and dependability on IT present world initiated changes in banking habits. Bank deliver IT based products and services. Technology is driving social change in a very furious way. The IT is emphasizing on the development of retail banking services. It is observed that customer retention is possible by expanding credit card market which increase the market share and profitability.

INFORMATION TECHNOLOGY IN THE BANKING SYSTEM

Dr. C. Rangarajan Committee Report (1984) sought computerisation and mechanisationof head, zonal and branch offices.The implications of technology created changes in the service oriented

business. Customers are seeking closer connectivity with the service provider. Banks focus in branding by technology for revenue. Technology ensures banking at higher quality, efficiency and speed. Internet and mobile banking serves the demands of customers from diversified locations. Customers want customized products and services apart from the branch banking module. Customers are the king in marketthey shall be connected to the business round the clock. Customer attraction through advertisements, online banking, customer grievance redressalby customer care services has become a new trend to increase the customers. Rajashekara K.S. (2004)Described IT initiated changes in banking operations by influencing on banking transactions and culture. The automation encouraged universal and investment banking by online banking, telephone banking and Automated teller machine etc.

TECHNOLOGICAL DEVELOPMENTS IN BANKING SECTOR

Economic reforms by government made banking competitive. New competitors were added to the business. IT revolution in bankingcreated easy and dynamic services by redefining the strategies and approaches. Banks started class banking instead of mass banking. Banking with technology is more easy and convenient. The promotion banks by Foreign direct Investment has increased the competition in banking business and gave rise to many foreign banks and its ATM stations in India. Kamakodi et al (2008) banks have to seek to the retention of existing clients and attract the new customers through IT based services, deal with personal touch as an operational strategy.

Use of Internet as facilitator in Banking

The dream of bankingeverywhere was realized by Internet in banking. E-banking and fund transfer along with other subsidiary services become a challenging area in banking. Severe threat is created to bankers by the new players in fund transfer. Internet links the world by network to enable the exchange of informations and created social changes in the society. The internet had given new dimension to employment, knowledge, communication, enjoyment, business and

health. It handles tools like e-mail, e-commerce, file storage etc. internet has ended the distance. According to Ananthakrishnan G. (2005) Ascomputers and ATMsdilutedcustomers relationship with bank, it should provide service to meet the customer need by modifiying the quality and terms of service instead by depending on traditional path which may perish their market share.

E- COMMERCE

The World Wide Web services have become the platform for electronic commerce of buying and selling goods and services which generates direct revenue through global communications. Banks and financial institutions started projecting their entire business to the public by using advanced software technology which facilitates for two way client interactions rather simply telecasting rigid web pages.

E-BANKING

E-banking renders banking products and services through electronic channels like telephone, internet and mobile phone technologies. This ensures the credibility of service through effective payment and accounting system with high speed of banking services. Jadhav (2004) depicted that roots of e-banking such as ATMs, Tele-banking, Mobile Banking, Internet Banking should be designed after analyzing the opportunities, challenges and security measures involved with the system.

CORPORATE INTERNET BANKING (CIB)

By using computers customer can access his account at any branch, keep a track over the transactions of different branches. Online banking helps in fund transfer, data base covering the current balance, cash credit limit, drawing power, usage of money in excel or text document. The integration of statement with customers Enterprise Resource Planning system (ERPs) which facilitates transfer of fund between linked account as a means of bulk transfer. Customer can have user wise cap by keeping number of approvals for fund transfer, without approval fund transfer cannot be done. After making power of attorney with the dealer they could credit and

pay through this channel. Customer can entail registration of account by email, stop payment of cheque, cheque book replenishment, Demand Draft, open fixed deposit account, recurring deposit account. The CIB being a registered use will involve corporate id, user id and password saved to banks database and integrated with management information system.

INTRANET

Intranet being similar to internet but speculated only for restricted users or institutions by prohibiting external access. The systems of the branches will be connected to the administrative office where in MIS returns of any branches under it can be directly accessible. This facilitates inter branch account conciliation. The rigid administrative systems and procedures of vast enterprises can be computerized and functions inter connected from different parts of the globe by this system.

SUBSIDIARY SERVICES

Banks are providing variety of products and services by adopting the competitive advantage of technology in all sectors. Using technology in banks need investment and high labour cost which may lead for outsourcing some banking activities.

PERSONAL INVESTMENTS THROUGH E-BANKING

The banks website also allows the customer to invest in shares, mutual funds and other financial products.

- **ONLINE TRADING IN SHARES:** Bank provides opportunity for easy delivery of share or money. Customer can carry on Margin trading where, one can buy shares after foreseeing the positions of stocks. Customer can have perfect liquidity through cash on spot delivery of shares and amount will be credited to his bank account in the same day and can be withdrawn by ATM Service. Direct sale of share at any registered stock exchange of the country with D- MAT Account.
- **ONLINE INVESTMENT IN MUTUAL FUNDS:** Without muchrigid paper works one can invest in mutual funds through Electronic banking system. Rigidity in signatures and

proof of identity for investing liberalized so that his fund will be automatically debited and credited according to his unit holdings.

CREDIT CARD

The Banks worth aboveRs 100crore can issue credit card facility independently or in collaboration after approval of the RBI or in tie ups with other subsidiary company who undertakes domestic card business. It shall place a detailed review report over the category of credit card, number of issue and outstanding, credit card frauds and profitability on half yearly basis before its board of Directors. Internal fraud prevention committees shall be constituted for making laws, prevent fraud and foresee the enforcement measures. Proper mechanisms about recovery of over dues, sharing information's and processing are to be maintained for efficiency and profitability.

SMART/ DEBIT CARD

Banks worth more thanRs 100 crores can issue off line debit cards by Straight Through Processing (STP).Banks cannot issue smart or debit cards in tie-up with other non-bank entities. It should only approve the debit cards operations along with review notes from the board of directors at half yearly basis during end of March and September every year. Obtaining approval from Reserve Bank of India is not mandatory but copy of agenda note, resolution passed in the board and submitted to Chief General Manager and Department of IT.

E- Payment

- ***E-RAIL (ELECTRONIC RAIL BOOKING)***: An individual can book railway ticket online through internet banking. The fee shall include reservation charges, courier charges and bank service fee. The customers account will be debited to the extent of payment and ticket will be delivered at the reservation counter only.
- **NEFT:** An electronic payment system without keeping any limit over the transaction value provided on all days except Sundays and National Holidays across the states where, payment instructions between the banks is processed at fixed time in every day.

- **PAYMENT OF BILLS THROUGH ELECTRONIC FUND TRANSFER (EFT):** Banks facilitate in payment of telephone, mobile, credit card bills, water, electricity, insurance premium from his desktop or mobile through electronic fund transfer which reduce risk of missing the deadline, loss of interest thereby save time.
- **THE ELECTRONIC SHOPPING:** The customer can also make his shopping payment through the banks secure website so that he can shop online without any security worries, as the bank can provide online-real time shopping mall services through franchised shopping sites.

INFORMATION TECHNOLOGY REGULATIONS IN INDIAN BANKING

INFORMATION TECHNOLOGY (IT) ACT, 2000 [AS AMENDED BY INFORMATION TECHNOLOGY (AMENDMENT) ACT 2008

Communication system and digital technology brought a magnificent shift of business transactions since from two decades. Electronic business transactions eliminate the distance between the trading partners. The law governing commercial transactions should be consisting in its execution. Use of Internet and unfamiliarity with internet usage may lead for fraud and cyber crime. The Customer protection through the education on security risks may check the reputation risk of the banks (Yang Z.*et al.,* 2004).Gulati et al. (2002) suggested that IT strategies in India should focus towards the short or long collaboration of business objectives with the technology through a constructive strategies towards planning. As Electronic commerce is free from paper base transactions there is a need for legal changes to demonstrate legal rights and obligations derived from the electronic means. Government of India formulated IT Policy as per United Nations Commission on International Commerce in 1996. Indian Parliament enacted ITAct, 2000 [IT Amendment Act 2008]for India which provides legal recognition for electronic communication in "Electronic Commerce". The act does not apply to the Negotiable Instruments, powers of Attorney, Trusts, Wills or other Testamentary Dispositions, Contracts for the sale of immovable property and other transactions notified by the Central Government.

LEGAL SPECULATIONS ON ELCTRONIC TRANSACTIONS

Any person authorized with electronic signature certificate may authenticate an electronic record by affixing his digital signature through "Asymmetric Crypto System" which contains private key for creating a signature and a public key to verify the signature specified in the Second Schedule. Legal recognition is given to all electronic records and electronic signatures and permitted to be used in Government and its agencies.The appropriate government can authorize the service providers and specify the service charges. Electronic information's are retained and validated under any law by identifying the origin, destination, date and time of receipt and audit. Central government can make rules regarding type, manner, format and procedure of identification of authentication of electronic signatures which ensure credibility, safety and security of electronic records and payments. The contract is validated in electronic form. An electronic record shall be attributed to the originator. Aknowledgement of receipt of electronic records is permitted. The legal validity to Electronic Signatures and Electronic records is ascertained by controller of Certifying Authorities (CCA) after certification of such signatures.

The act specify IT offences in chapter XI of the act. The specified penalties include for tampering with computer source documents imprisonment up to 03 yearsor fine upto 2lakh rupees or with both. For computer related offences with imprisonment for 2 to 3 years or with fine upto 5 lakh rupees or both. Sending Offensive messages through communication system with imprisonment upto 2 to 3 years or with fine. For Dishonestly reciving stolen computer resource or communication device with imprisonment for 3 years or with fine upto1 lakh or both. For Identity theft imprisonment of 3 years and fine upto1 lakh.For Cheating by personation by using computer resource with imprisonment upto3 years and fine upto1 lakh rupees. For Violation of privacy with imprisonment upto 3 years or fine upto2 lakh rupees or with both and for Cyber terrorismwith life imprisonment.

AMENDMENTS IN FURTHERENCE OF INFORMATION TECHNOLOGY ACT

It will be seen from the above that this enactment of IT Act, 2000 shall usher in new era for e-governance and e-commerce. It validates and recognize the contracts formed through electronic means, facilitates electronic filling of documents with the government agencies and supports its admissibility in the courts. IT act amended the following legislations.

- **The Indian Penal Code, 1860:** Section 446 (Dealing with forgery of records), a register include electronic form. In section 354D(Stalking) if any man monitors the use of internet, email or other electronic communications shall be punished with imprisonment upto 3 years and fine and on further conviction imprisonment for 5 years and with fine.
- **Indian Evidence Act, 1872:**Electronic records covering digital signatures and digital certificates are included in evidence.The Electronic books of account (Sec 34). Sec 47A for forming opinion on digital signature, certifying authorities opinion is relevant. Sec 65 B any information in electronic records aredeemed as document to be admissible for evidence of any original content. In Sec 67A other than secure electronic signatures digital signature of any subscriber shall be proved. Sec 73A Court may verify Digital Signature Certificate to prove digital signature.
- **Bankers Books Evidence Act, 1891:** Included all electro-magnetic data storage device in the bankers book.
- **The Reserve Bank of India Act, 1934:** Empowered the central board to make regulations for fund transfer through electronic means between the banks or other financial institutions. RBI (1984) has also adopted IT in endorsing the payment system's functionality and modernization on an ongoing basis by the development of Electronic Clearing Services (ECS), Electronic Funds Transfer (EFT), Indian Financial Network (INFINET), Real-Time Gross Settlement (RTGS) System, Centralized Funds Management System (CFMS), Negotiated Dealing System (NDS), Electronic Payment Systems with the 'Vision Document', the Structured Financial Messaging System (SFMS) and India Card - a domestic card initiative, implemented recently in 2011

CHALLENGES AND E-SECURITY MEASURES

HebbarRaveendranath (2004) commented that both automation and tele-communication has created greater impact over the financial institutions. Banks have found substitutive ways of services like ATMs, E-banking, Internet Banking services through easy reach policy. E-Commerce through electronic financial services has changed the phase of banking industry through empowering the banking relationships. The use of internet for service delivery by banks faced several challenging including the threat on security concerns in the present days. (Ziqi and Michael, 2003).Mittal R. K. and Dhingra Sanjay (2006-07) depicted that technology based services are more cost worthy than the branch banking but caution should be taken while selecting right channel, verify the interest on IT Investment, e-governance, customer relations, security issues etc. Banks should prefer skilled human resource, use data analytics tools to administer the customer's data to enrich customer loyalty. It can collaborate with other agencies to build the competencies.The very important threat is about the security of the channels, personal data and safety over transactions which are carried out in technology. Care has to be taken regarding the information safety through proper authorization of the user, confidentiality, credibility and duplication proof. New tools like security firewalls works as layer between corporate data and public internet. Filtering routers by prohibiting the incoming network, secured socket layer with service encryption, Digital certification and integrity hence, the internet networks can be monitored and regulated which proposed for fear free electronic commerce. World Wide Web by internet renders service round the clock to customers with complete security by eliminating the risk of visiting the branch. Specialized bank software with diversified new products is specified on websites to build public goodwill. Manual inter branch reconciliation, salary administration, publication of financial accounts and annul progress reports by centralized system lead to productivity. Orientation of services by banks, insurance industry, stockbrokers, mutual fund professionals facilitated sale of products to corporate customers also.

The customers orientation towards internet banking will involve effective mechanism over the limitations and handling these speculations should be the prime motive of every bank. The initial speculation is regarding security, integrity of the transient and stored data, secrecy by preventing unauthorized hackings to manipulate the contents. Customers are psychologically prevented

from publishing their bank details online. The intermediary problems of internet connectivity problems in the course of processing their online transactions which compels the customer to restart the process again and again from the beginning. The dissatisfaction regarding the quality of delivery speed, timely approach of service and limited online payment options may keep the customers away from net banking process.

THE SECURITY FEATURES IN THE SOFTWARE

Total security is ensured through full proof devices with additional features like firewalls, data encryption, digital certification, biometric techniques, unique and safe passwordetc so that unauthorized person cannot access the customers account which makes the site free from hacking. Navigators will not capture the memory which prevents access to the log out accounts through back button and time out facility of 5 minutes for the screens there by non usage of screen for speculated time automatically logs the viewer from the site. This facility through internet provides management of cash flows, ease monitoring and proper Management Information System. V. Radha (2008) under her study observed about technology based opportunities for fraud like Mail Spoofing, Web Spoofing, Attacking the User Computer, Attacking a Bank's Server, Media tapping and Denying service and suggested to limit the fraud through constructive technological defensive mechanisms.

ANALYSIS AND DISCUSSIONS

Table No-01 depicts about the majority number of cyber crime cases registered in the states and union territories along with the increase ratio in one year from 2012 to 2013. Out of total 2876 crimes in 2012 and 4356 crimes in 2013 with (94.4 per cent) annual increase in the crime rate of the country, Maharashtra stands 1st with 681 cases (44.6 per cent) increase, Andra Pradesh in 2ndplace with 635 cases (48 per cent)increase, Karnataka in 3rd place with 513 cases (24.5 per cent) increase, Uttar Pradesh in 4th place with 372 cases (81.5 per cent) increase, Kerala in 5th Place with 349 cases (29.7 per cent) increase, Madhya Pradesh in 6th Place with 282 cases (98.6

per cent) increase, Rajasthan in 7th with 239 cases (62.6 per cent) increase, West Bengal in 8th with 210 cases (7.1 per cent), Assam in 9th with 154 cases (450 per cent) increase, Punjab in 10th with 146 cases (102.8 per cent) and Delhi stands 1stamong the union territories with 131 cases (72. 4 per cent) increase and Lakshadweep, Dadra Nagar and Haveli have not seen a single case of cybercrime.

Table No-01

Cases Registered Under Cyber Crimes in States during 2012 & 2013

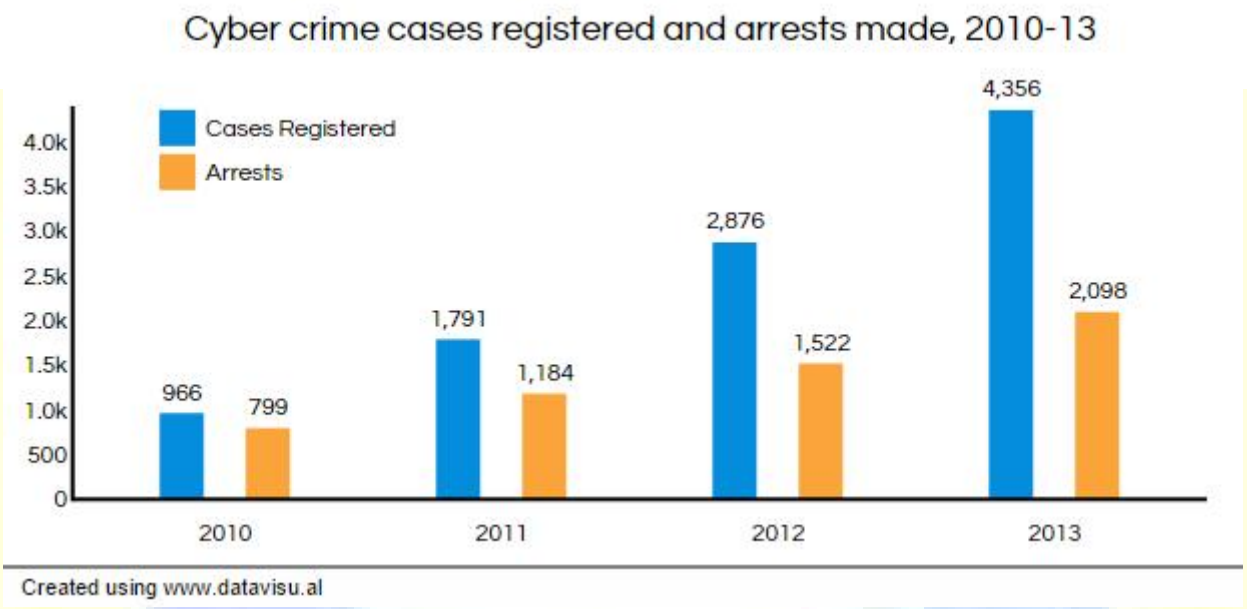
Sl. No	State	Position	2012	2013	Variance
01	Maharashtra	1st	471	681	**44.6**
02	Andra Pradesh	2nd	429	635	**48.0**
03	Karnataka	3rd	412	513	**24.5**
04	Uttar Pradesh	4th	205	372	**81.5**
05	Kerala	5th	269	349	**29.7**
06	Madhya Pradesh	6th	142	282	**98.6**
07	Rajasthan	7th	147	239	**62.6**
08	West Bengal	8th	196	210	**7.1**
09	Assam	9th	28	154	**450.0**
10	Punjab	10th	72	146	**102.8**
11	Delhi (Union Territory)	1st	76	131	**72.4**
	Total Crimes in all States		**2761**	**4192**	**51.8**
	Total Crimes in Union Territories		**115**	**164**	**42.6**
	Total Crimes in the country		**2876**	**4356**	**94.4**

Source: National Crime Records Bureau (NCRB)

It is inferred that Maharashtra, Andra Pradesh and Karnataka assures 70 per cent to Indian revenue from IT Industries but stands top 03 in cyber crimes. Assam and Punjab witnessed

enormous increase in crime ratio and West Bengal registered low level of increase when compared to 2012.

Figure No-01

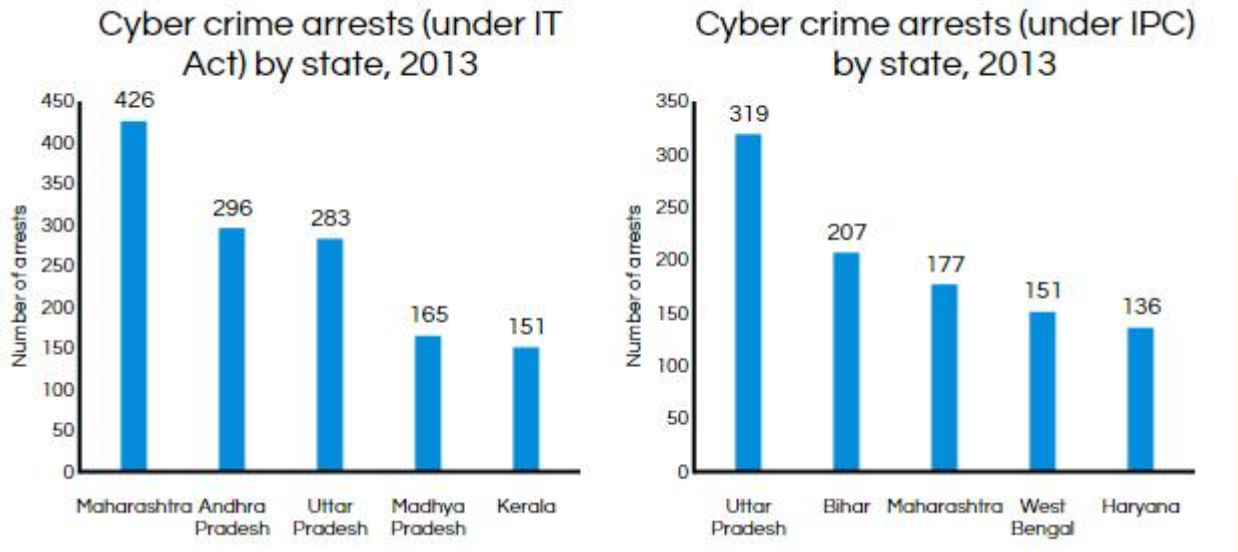


Source: National Crime Records Bureau (NCRB)

Figure No-01 reveals about cyber crime cases registered and arrests under IT Act between 2010-2013. Total 966 cases in 2010, 1791 in 2011, 2876 in 2012 and 4356 cases were registered in 2013 respectively. Total 799 persons arrested in 2010, 1184 in 2011, 1522 in 2012 and 2098 in 2013 respectively. It is inferred that There is a rise of 51.5 per cent cases in just one year. Figure No-02 reveals the state wise data about cyber crime arrests under IT Act and IPC in the year 2013. Out of Total 2098 persons arrested under IT Actmajority (426)in Maharastra, (296) in Andra Pradesh (283) in Uttar Pradesh, (165) in Madhya Pradesh and (151) from Kerala respectively. Out of Total 1203 arrests under IPC majority (319) in Uttar Pradesh, (207) in Bihar, (177) in Maharastra,(151) in West Bengal and (136) Haryana respectively. It is inferred that more IT crimes committed in Maharastra and IPC Crimes committed at Uttar Pradesh.

Figure No-02

State wise arrests under IT and IPC in 2013



Source: National Crime Records Bureau (NCRB)

Table No-02 depicts about number of cases registered and persons arrested in 2013 under IT and IPC. Out of total 4356 cases registered and 2098 arrests under IT act, Majority 1966 cases and 818 arrests for damaging computer resources, 550 cases and 193 arrests in Hacking, 137 cases and 59 arrests for tampering computer documents, 93 cases and 30 arrests for breach of confidentialityand 71 cases and 51 arrests for Fraud in digital certificate. Out of Total 1337 cases registered and 1203 arrested under IPC, Majority 747 cases and 626 arrests for Forgery, 518 cases and 471 arrests for Criminal Breach of Trust/Fraud, 59 cases and 93 arrests in counterfeiting. It is inferred that more cases and arrests are done for Damage to computer resources, Forgery, hacking and Fraud offences in 2013.

Figure No-03 depicts about age group of arrested persons under cyber crime in the year 2013. Out of total 2098 persons arrested under IT Act and 1203 persons arrested under IPC, Majority 1638 persons belong to 18-30 age group, 1325 persons between 30-45 years, 275 persons between 45-60 years, 45 persons between 0-18 years and remaining 18 persons above 60 years of age. It is inferred that overwhelming majority of arrested persons are between 18-30 years.

Table No-02

Cases Registered & Arrests under IT Act and IPC during 2013

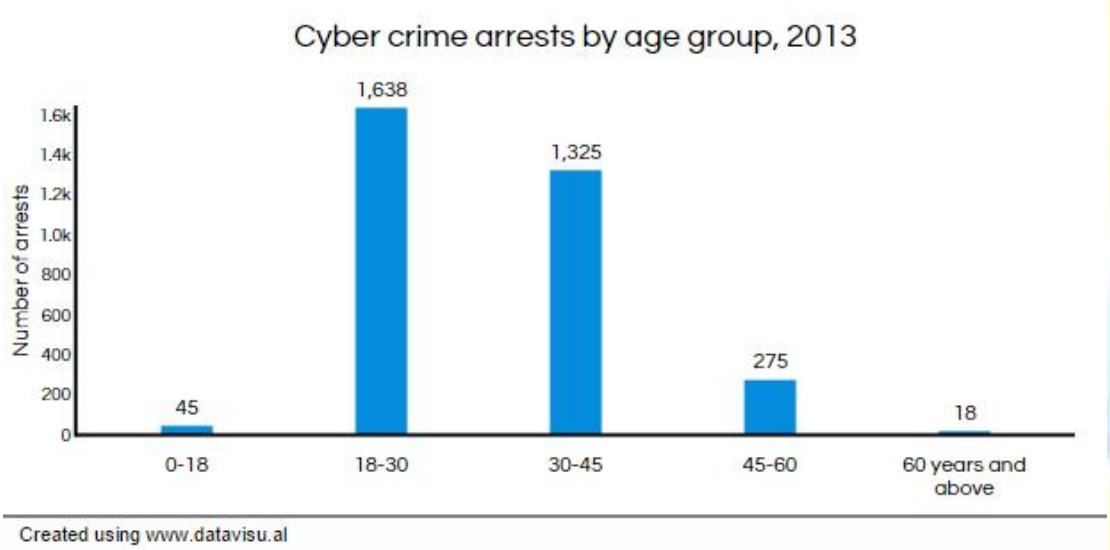
Sl. No	Offences committed	Committed Under	Cases Registered	Persons Arrested
01	Loss / damage to computer resource / utility	Sec 66 (1) IT	1966	818
02	Forgery	IPC	747	626
03	Hacking	Sec 66 (2) IT	550	193
04	Criminal Breach of Trust/Fraud	IPC	518	471
05	Tampering computer source documents	Sec 65 IT	137	59
06	Breach of confidentiality / privacy	Sec 72 IT	93	30
07	Fraud Digital Signature Certificate (Section 74)	Sec 74 IT	71	51
08	Counterfeiting i) Property/mark ii) Tampering iii)Currency/Stamps	IPC	10 08 41	34 10 49
		Total Under IT Act	**4356**	**2098**
		Total Under IPC	**1337**	**1203**

CONCLUSION

India stands second largest user of internet with 302 million users but there is a need for protection of Indian cyber space. IT revolution in banking encouraged customer centric model than product centric business. The quality of service is the key to success in banking. Service strategies of banks should coexist with its marketing plans. Indian banking focus on meetingfinancial need, risk management, adoptto global regulations, technology empowered service, discovery ofeasy and faster delivery channelsto globally compete. Use of smart phone and internet, Non scrutiny of security certificates while downloading applications from unsecured sites boost for cyber crime.People are cheated bysending fake emails through

"Phising" in the name of banks requiring the disclosure of banking details.Informations sent hiding the identity from hidden servers as spam, corrupting or erasing computer system by virus, transmission of illegal informationsin delivery channels, Manupulation of website by hacking etchad become threat to E-Banking. Jain Abhay and Hundal B. S. (2006) depicted that Present banking demands new products, international compatibility through technology.

Figure No-03



Source: National Crime Records Bureau (NCRB).

Banks should market its products to reach technology enabled customers. This paper studies the Empowerment of Banking services through IT and threat by cyber crimes and analyses legal implications hampering customer satisfaction.It is found that even though Maharashtra, Andra Pradesh and Karnataka states assures 70 per cent to Indian revenue from IT Industries, but stands top 03 in cyber crimes. Assam and Punjab witnessed enormous increase in crime ratio and West Bengal registered low increase in cyber crimesin 2012. In 2013, more IT crimes are committed in Maharastra and IPC crimes in Uttar Pradesh. More arrests are conducted for the offences like damage to computer resources, forgery, hacking and fraud. These crimes are committed by young persons between 18-30 years of age. Economic growth and security of the nation depends on the secured and protected cyber space of that country. Education of the customers in cyber crimes is the need for the day to control the cyber crime in future. All customers should be empowered to be careful, educated and protected from cyber crimes in banking. According to Uppal R. K. (2008) the merger of economic policies and IT have resulted in changes of banking

operations which diversified the traditional banking system to be e-banking where, most of the customers are satisfied with the technological banking services but the awareness to deal with the recent technology in banking is the major challenge for the people.

REFERENCES

1. Das, P.K. (2010). The up-scaling of technology to build inclusive financial systems in India.'*Journal of Education Administration and Policy Studies'*.Vol. 2, No. 5, pp. 67-70.
2. Fredriksson, O. (2003). 'Internet-based self-services: Relational Aspects of E-Banking'- *A private client survey analysis,* IMIT working paper series, P. 136.
3. Kotlar, P. and Bloom P.N. (1984). 'Marketing Professional Services', Prentice Hall, New Jersey, P. 174.
4. Rajashekhara K. S., (2004) "Application of IT in Banking", *Yojana*, July
5. Kamakodi N., M Basheer Ahmed Khan, 'Customer Expectations and Service Level in E-Banking Era: An Empirical Study', *The ICFAI University Journal of Bank Management*, Volume VII Issue 4 (Nov. 2008), Pages**:** 50-70
6. Ananthakrishnan G, (2004-05) "Customer Service in Banks",*Vinimaya*, Vol. XXV, No.3.
7. Jadhav A. S., Mrs. R. A. Jadhav, (2004) "Status of e-banking in India", *National annual convention of CSI.*
8. Yang, Z.; Jun, M. and Peterson, R.T. (2004). 'Measuring Customer Perceived Online Service Quality',*International Journal of Operation and Production Management*. Vol. 24, No. 11. pp. 5-10.
9. Gulati V. P., Sivakumaran M. V., C. Manogna, (2002). "IT framework for Indian banking sector", *ASCI Journal of Management* 31 (1&2). 67-77
10. Reserve Bank of India. (1984). Report of the Committee on Mechanisation in Banking Industry.
11. HebbarRaveendranath, (2003-04). "Building trust in E-Banking", *Vinimaya,* Vol. XXIV. No 4,

12. Ziqi, L. and Michael, T.C. (2003). 'Challenges to internet e-banking'.*Communications of the ACM Archive: Mobile Computing Opportunities and Challenges*. Vol. 46, No. 12, pp. 248–250.
13. Mittal R. K. and Dhingra Sanjay, "Technology in Banking Sector: Issues and Challenges", *Vinimay,* Vol.XXVII, No.4, 2006-07.
14. Radha V. "Preventing Technology Based Bank Frauds", *The Journal of Internet Banking and Commerce*, Dec. 2008, Vol. 13, No. 3.
15. Jain Abhay and Hundal B S, "Barriers In Mobile Banking Adoption In India", *ICFAI University Journal of Bank Management*, Vol. V, issue 3 (Aug.2006), pages 64-73
16. Uppal R. K., (2008) "Customer Perception of E-Banking Services of Indian Banks: Some Survey Evidence", *The ICFAI University Journal of Bank Management*, Volume-VII Issue-1, Feb, Pages 63-78