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# punjab national bank institute of information technology


# e-track

*business of future*

# e-track

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## Thought for the quarter

"The only way to do great work is to love what you do if you haven't found it yet, keep looking. Don't settle. As with all matters of the heart you'll know when you find it.

## From the Editor

Dear Readers,
Greetings!

The pleasure that I feel in associating with you as as an editor after a long gap is inexpressible. However a few words can bridge the gap in one go very soon.

During this period PNBIIT has achieved several landmarks in its growth trajectory which I am happy to mention. The enormously talented staff under high tech environment and state of art system accomplished many challenging tasks. Some of these are software developments , imparting remarkable training to staff of several esteemed Institutes, to horne their skills, Excellent summer training to B Tech students of various Engineering colleges, 100% placements to students of prestigious course ADBT etc.

We are beginning a new chapter in this association with the readers. I will always make an effort to bring forward latest development in the field of Banking and Technology at your doorstep. Your feedback and valuable comments have always been cherished and are most welcome.

Happy reading!

Pratima Trivedi
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## MESSAGE FROM THE DESK OF MANAGING DIRECTOR & CEO

Indian Banking industry today is in the midst of a Technology Revolution. A combination of regulatory and competitive reasons has led to increasing importance of total banking industry. Digital Technology has brought about significant changes in the business process and has improved productivity by reducing transaction cost. It has also facilitated the outreach of banking services in the rural areas through Financial Inclusion.

Punjab National Bank's vision is to position itself as a world class, cost effective and customer- friendly bank, integrating technology in serving various segments of the society, to help inclusive economic growth. PNB has never looked technology as a tool but it has used it as a business enabler - a key driver in business development and financial inclusion.

In its endeavour to spread the Technology culture, PNB has also set up "Punjab National Bank Institute of Information Technology (PNBIIT)". It is an autonomous body dedicated to the Nation, with the objective of imparting training and education for effective use of Technology, in developing operations and business banking to improve customer service.

During the discussions held at Gyan Sangam at -NIBM Pune, it was emphasized that Public Sector Banks need to fulfil multiple objectives through technology, to stay competitive in emerging environment, enhance customer satisfaction, deepen financial access, improve productivity, enable scalability, reduce cost and improve profitability.

I am happy to note that PNBIIT is again coming out with its quarterly journal "e track", to bring awareness about IT innovations as well as to spread and enhance the technology awareness among the banking fraternity. The journal has collection of informative articles, which for sure will add to the Knowledge of Readers.

I wish all success to PNBIIT and “e-track”, in its endeavour to educate people.

(GAURI SHANKAR)
MD & CEO
Punjab National Bank
Chairman, Governing Body, PNBIIT Lucknow

## Director's Message

In competitive service industry only those organizations will flourish who can provide the services to the customers irrespective of their location. Suitable cost effective technology is the key driver towards meeting the above objective.

Bank has to play a major role towards meeting customer's requirement. It should provide services to customer at their convenience irrespective of time, location and ensure customer satisfaction. Steps need to be taken to improve delivery to the customer.

Keeping this in mind Punjab National Bank has established Punjab National Bank Institute of Information Technology (PNBIIT) which has proper infrastructure to provide the knowledge to utilize the banking technology.

The vision of PNBIIT is to develop an Institute of reckoning to serve as an infrastructure model with high-tech environment and state-of-the art systems, demonstrating use of IT in the management of administrative and training activities and development of IT maturity in banking, insurance and other financial sectors through research, development, consultancy and educational endeavors.

Its Mission is to make it a self sustaining Institute of International standards having the status of a deemed university and having organic linkages with other national and transnational academic Institutions in the area of IT, in various fields of universal banking.

PNBIIT is in the process of establishing Forensic Lab along with innovative courses to spread the knowledge to counter menace of ever increasing cyber crimes.

*Shri P S Ganapathy*
*Director –PNBIIT*
*Email: psganapathy@pnbiit.ac.in*

# Financial Freedom Through Banking Technology

*Prashsant Gupta*

## INTRODUCTION

Technology has brought about a complete paradigm shift in the functioning of banks and delivery of banking services. It is no longer an enabler but a business driver. For any organization, technological innovation is a key growth of information technology in banking has brought comfort to many, customers no longer require visiting branch for anything and bankers no longer need to go through daily grind of balancing their books or bank officials need not maintain huge manpower. The growth of the internet, mobiles and communication technology has added a different dimension to banking. The information technology (IT) available today is being leveraged in customer acquisitions, driving automation and process efficiency, delivering ease and efficiency to customers. Electronic clearing services (ECS), National electronic fund transfer (NEFT), Real Time Gross Settlement (RTGS) Automated Teller machine (ATMs), and core banking solution (CBS) have accelerated the pace of technology adoption in by bank and enabled inter-connectivity between banks.

Many of the IT initiatives of banks started in the late 1990s or early 2000 with an emphasis on the adoption of core banking solutions (CBS), automation of branches and centralization of operations in the CBS. Over the last decade, most of the banks completed the transformation to technology-driven organizations. Moving from a manual, scale-constrained environ-ment to a global presence with automated systems and processes, it is difficult to envisage the adverse scenario; the sector was in the era before the reforms, when a simple deposit or withdrawal of cash would require a day. ATMs, mobile banking and online bill payments facilities to vendors and utility service providers have almost obviated the need for customers to visit a branch. Branches are also transforming from operating as transaction processing points into relationship management hubs. The change has been very productive for banks bringing in an increase in productivity and operational efficiency to be more competitive. Better risk management due to centralization of information and real time availability of critical data for decision making. With most of the banks being technology-enabled, the focus is shifting to computerizing regional rural banks (RRBs). In addition, banks are moving toward decision making and

business intelligence software and trying to optimize the IT infrastructure created.

IT in Banking

Indian banking industry, today is in the midst of an IT revolution. A combination of regulatory and competitive reasons has led to increasing importance of total banking automation in the Indian Banking Industry. The bank which used the right technology to supply timely information will see productivity increase and thereby gain a competitive edge. To compete in an economy which is opening up, it is imperative for the Indian Banks to observe the latest technology and modify it to suit their environment. Information technology offers a chance for banks to build new systems that address a wide range of customer needs including many that may not be imaginable today.

Following are the innovative services offered by the industry in the recent past:

A. Electronic Payment Services - E Cheques

Nowadays we are hearing about e-governance, e-mail, e-commerce, e-tail etc. In the same manner, a new technology is being developed in US for introduction of e-cheque, which will eventually replace the conventional paper cheque. India, as harbinger to the introduction of e-cheque, the Negotiable Instruments Act has already been amended to include; Truncated cheque and E-cheque instruments.

B. Real Time Gross Settlement (RTGS)

Real Time Gross Settlement system, introduced in India since March 2004, is a Interlink Research Analysis system through which electronics instructions can be given by banks to transfer funds from their account to the account of another bank. The (RTGS) Real Time Gross Settlement system is maintained and operated by the RBI and provides a means of efficient and faster funds transfer among banks facilitating their financial operations. As the name suggests, funds transfer between banks takes place on a 'Real Time' basis. Therefore, money can reach the beneficiary instantaneously and the beneficiary's bank has the responsibility to credit the beneficiary's account within two hours.

C. Electronic Funds Transfer (EFT)

Electronic Funds Transfer (EFT) is a system whereby anyone who wants to make payment to another person/company etc. can approach his bank and make cash payment or give instructions/authorization to transfer funds directly from his own account to the bank account of the receiver/beneficiary.

Complete details such as the receiver's name, bank account number, account type (savings or current account), bank name, city, branch name etc. should be furnished to the bank at the time of requesting for such transfers so that the amount reaches the beneficiaries' account correctly and faster. RBI (Reserve Bank of India) is the service provider of Electronic Funds Transfer (EFT).

D. Electronic Clearing Service (ECS)

Electronic Clearing Service is a retail payment system that can be used to make bulk payments/receipts of a similar nature especially where each individual payment is of a repetitive nature and of relatively smaller amount. This facility is meant for companies and government departments to make/ receive large volumes of payments rather than for funds transfers by individuals.

E. Automatic Teller Machine (ATM)

Automatic Teller Machine is the most popular devise in India, which enables the customers to withdraw their money 24 hours a day 7 days a week. It is a device that allows customer who has an Automatic Teller Machine (ATM) card to perform routine banking transactions without interacting with a human teller. In addition to cash withdrawal, Automatic Teller Machines (ATMs) can be used for payment of utility bills, funds transfer between accounts, deposit of cheques and cash into accounts, balance enquiry etc.

F. Point of Sale Terminal

Point of Sale Terminal is a computer terminal that is linked online to the computerized customer information files in a bank and magnetically encoded plastic transaction card that identifies the customer to the computer. During a transaction, the customer's account is debited and the retailer's account is credited by the computer for the amount of purchase.

G. Society for Worldwide Inter-bank Financial Telecommunications (SWIFT)

SWIFT as a cooperative society formed in 1973 with 239 member banks from 15countries. It provides highly cost effective, reliable, secure and rapid mode of transmitting financial messages worldwide. The network was upgraded in 80s and its revised version is SWIFTII. SWIFT provides 24x7 hour services to the financial institutes and the selected range of its users. It ensures its users against any loss of mutilation against transmission

H. Debit and Credit Clearing System

Debit clearing system is a service commonly

used for making payments in lieu of utility services like telephone bill or payment of electricity bill. Under this system, customer authorizes the service provider to debit his bank account periodically for the units consumed by him. This authority letter is being submitted by the service provider to the respective bank which makes payments on due date. Periodical payment to a large number of groups by the customer is usually made by credit clearing system. Under this system customer hands over the amount and the list of proposed recipient to the bank who further makes payment on customer's behalf. This service is mainly used by corporate houses for making periodic payment of dividend or interest. Such electronic clearing systems bring savings in terms of efforts as well as cost to all concern parties.

I. Electronic Data Interchange (EDI)

Electronic Data Interchange is the electronic exchange of business documents like purchase order, invoices, shipping notices, receiving advices etc. in a standard, computer processed, universally accepted format between trading partners. Electronic Data Interchange (EDI) can also be used to transmit financial information and payments in electronic form.

J. Phone Banking and Mobile Banking

Telephone banking refers to the access of account, transfer funds, summary sheet and other banking services through dialing one telephone number. In case of mobile banking, the banking services are provided to the customers having the credit card accounts with bank. In mobile banking, the services are provided by the association of banks and cellular service providers through SMS or WAP enabled mobile instruments. HDFC bank, ICICI bank and Citi banks are offering mobile banking in India in association with cellular service provider such as Orange Tel, Airtel, Sky Cell and BPL mobile.

Implications

The banks were quickly responded to the changes in the industry; especially the new generation banks. The continuance of the trend has re-defined and re-engineered the banking operations as whole with more customization through leveraging technology.

As technology makes banking convenient, customers can access banking services and do banking transactions any time and from any ware. The importance of physical branches is going down. Thus, the changes have the following implications:

- Anywhere Anytime Anyplace Banking
- Timeless and Placeless Banking
- Banking at Convenience
- Dismantling of Physical Structure
- Goodbye to Traditional Instruments and Invitation to New Instruments
- Disappearance of Conventional Risk and Arrival of New Risks
- Leading to Currency-less Monetary system

Challenges in Implementation

It is becoming increasingly imperative for banks to assess and ascertain the benefits of technology implementation. The fruits of technology will certainly taste a lot sweeter when the returns can be measured in absolute terms, but it needs precautions and the safety nets. The increasing use of technology in banks has also brought up 'security' concerns. To avoid any mishaps on this account, banks ought to have in place a well-documented security policy including network security and internal security. The passing of the Information Technology Act-2000 has come as a boon to the banking sector, and banks should now ensure to abide strictly by its covenants. An effort should also be made to cover e-business in the country's consumer laws. Some are investing in it to drive the business growth, while others are having no option but to invest, to stay in business. The choice of right channel, justification of IT investment on ROI, e-governance, customer relationship management, security concerns, technological Obsolescence, mergers and acquisitions, penetration of IT in rural areas, and outsourcing of IT operations are the major challenges and issues in the use of IT in banking operations.

Future Trends

A. Beyond Core Banking

Increased adoption of e-payments and mobile banking are clearly the emerging areas which are bound to strengthen in the near future. In addition, the focus is shifting towards systems and processes needed in the maturity phase of the Technology needs curve. Banks will need to increasingly focus on cost and profitability management, business intelligence, dashboards/executive information reports, data warehousing and analytics. Improving internal effectiveness and efficiency with integrated data warehouse and real-time access to all customer information will help the banks' decision making and ability to deliver appropriate products and services to the customers. Banks must see beyond applications that provide solutions to today's problems. They need to develop a vision of a comprehensive infrastructure comprising internal and external networks instantaneously moving

information from data stores to users and back again. The importance of the IT-business unit partnership cannot be overemphasized. The people and processes are just as critical to success as hardware and software. Undoubtedly, banks have made great technological advances in storing information. However, the full power to use that information to be more productive and make better decisions still goes unrealized. By continuing to emphasize only technology and the peripheral business processes it affects, banks have seriously neglected their personal and enterprise-wide intelligence. The effectiveness of the infrastructure is measured in the value it brings to the customer. That value is diminished by business units and individuals that are not networked. Therefore, banks must provide access and training, to each member of the bank who directly or indirectly serves customers. To make this possible, clear standards and expectations must be published, so the information technology organization can bring individuals online in a consistent manner.

B. Increasing Interconnectivity and Ease of Payments through Different Form Factors

The economic role of payment systems is connected intimately to the economic role of money. Money is a unit of account, a store of value, and a medium of exchange. Cash, checks, I ectronic transfers, debit, credit and charge cards, as well as payment methods relying on mobile phones and on the internet are based on different systems for exchanging value between economic entities and on different form factors for engaging in this exchange. Anywhere anytime banking is becoming the norm due to the implementation of core banking solution (CBS), additionally increased efforts by the regulator in setting up Electronic Clearing Service (ECS), Real Time Gross Settlement (RTGS) and NEFT systems is leading to interconnectivity and ease of inter and intra-bank funds transfer. The increasing usage of credit/debit cards and mobile banking is facilitating the ease of payments through different factors linked to vendors and service providers. The trend is likely to strengthen with an increasing number of transactions moving online. Presently, a technological development is closely related to computerization in banks branches for adoption of the core banking solution (CBS). An important development in the percentage of branches of public sector banks implementing core banking solution (CBS).

C. Energy Management and Move towards 'Green Technology'

Most of the banks are conscious of the carbon foot print generated and are working towards

energy management and use of 'Green Technology'. Some of the measures adopted are:

Adoption of Server Virtualization technologies to save on floor space, power & cooling components, Use of Data center enhancements and Best practices for optimum usage of space, hot air/cool air pockets etc., Adoption of Blade server technology to have higher computing power in smaller footprint. Upgradation of older power hungry Servers, Storage and Networking equipments.
Dynamic power capping of Servers, Desktops by employing newer power saving Technologies like processor stepping Solar powered ATMs Use of windmill energy.
Energy management and adoption of green technology will become increasingly important in the future and banks will have to streamline efforts towards accurately monitoring, measuring and optimizing the energy consumption.

Role of CRM Techniques

Customers have grown to expect comprehensive financial services from a single point of contact. They are attracted by many new graphical interfaces that support the customer's portfolio provide real-time access to all customer accounts and present them in an integrated, seamless interface. For the bank, technology creates a tool for gathering knowledge about customers' financial behaviors, purchasing proclivities, portfolio performance, and market and competitive alternatives. Profitability analysis is crucial to the bank's customer relationships, and it helps identify alternatives for delivering value to customers. At present, customer profit-ability is being redefined as customer relationship profitability. Customer relationship profitability includes not only a single customer account but the full relationship, which might extend to personal checking, a business account, an investment account, and more. For branch services to be mostly focused on marketing and cross selling, customer-centric knowledge will need to be leveraged in a well-teamed, highly automated branch platform.

A. Stronger Role of IT as Business Transformer /Performer

The bank infrastructure is not immutable. New technologies surface every day, and new media (like Internet did) will force management to reconsider infrastructural objectives. Defining fundamental infra-structure goals will enable the bank to stay focused and adapt without being distracted by technologies that do not contribute to customer value. The IT function can play a central part in helping organizations adapt to and thrive in this new

status quo. By aligning their teams with the needs of the business, chief information officers (CIOs) can provide strong strategic and operational support.

IT also has to consider its most appropriate role. In some cases, particularly for larger, global companies, senior management may expect IT to provide innovation and transformation, whereas in certain smaller firms the emphasis could be upon a more basic service, to keep costs down and serve daily operational needs efficiently. Typically, IT fits into one of four broad categories:-

1. Utility

- Where its main purpose is to keep the business running

2. Protector

- Where it is primarily concerned with managing the IT estate

3. Performer

- Where it is expected to deliver tangible value to the business

Transformer: Where the function transcends day-to-day operational needs to help bring real Change.

To advance from a more basic utility/ protector function to a transformer/ performer IT should better understand the needs of the leadership team, continuously work on delivering customer benefits and help the organization gain a competitive edge.

CONCLUSION

IT has no doubt changes the overall pattern of banking system. The banking today is redefined and re-engineered with the use of IT and it is sure that the future of banking will offer more sophisticated services to customers with the continuous product and process innovations. Thus there is a paradigm shift from seller's market to buyer's market. So banks also change their approach from “Conventional Banking to Convenience Banking” and “Mass banking to Class Banking”. So banks are now more concentrate on providing value added services to customers. But IT can be fully useful only if they enable to meet the challenges in the present environment. In India it can be successful only if it is properly implemented in rural areas also. There is also need to maintain privacy and confidentiality of data's. Many nations deem privacy to be a subject of human right and consider it to be the responsibility of those who concerned with computer data processing for ensuring that the computer use does not revolve to the stage where different

data about people can be collected, integrated and retrieved quickly. Another important responsibility is to ensure the data is used only for the purpose intended. For this, there is a need to implement IT and other Cyber laws properly. This will ensure the developmental role of IT in the banking industry

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# PREDICTIVE BANKING: DELIVERING OPTIMIZED SERVICES


## ABSTRACT

IT has helped the banking industry to deal with the challenges the new economy poses. Nowadays, Banks have realized that customer relationships are a very important factor for their success. Customer relationship management (CRM) is a strategy that can help them to build long-lasting relationships with their customers and increase their revenues and profits. Predictive Banking help Bank enterprises sustain competitive advantage by improving service to customers, increasing customer loyalty, achieving a greater return on promotion campaigns, reducing costs, and improving operational efficiencies. Predictive banking adds valuable and actionable insight over unstructured data so that banks can maximize profits and optimize processes. This article discusses the concept and requirement of predictive analytics in today's banking.


Keywords: Predictive analytics, credit risk modeling, customer relationship management.

*- Archana Sahai*

## INTRODUCTION

Predictive analytics is the branch of data mining concerned with the prediction of future probabilities and trends. The central element of predictive analytics is the predictor, a variable that can be measured for an individual or other entity to predict future behavior.

Multiple predictors are combined into a predictive model, which, when subjected to analysis, can be used to forecast future probabilities with an acceptable level of reliability. In predictive modeling, data is collected, a statistical model is formulated, predictions are made and the model is validated (or revised) as additional data becomes available. Predictive analytics are applied to many research areas, including meteorology, security, genetics, economics, and marketing. Predictive analytics describes any approach to data mining with four attributes:

- An emphasis on prediction (rather than description, classification or clustering)
- Rapid analysis measured in hours or days (rather than the stereotypical months of traditional data mining)
- An emphasis on the business relevance of the resulting insights (no ivory tower analyses)
- An emphasis on ease of use, thus making the tools accessible to business users.

Measurement of existing customer retention

rates is the first significant step in the task of improving loyalty. This involves measuring retention rates and profitability analysis by segment. Customer retention is directly proportional to customer satisfaction.

INCREASING CUSTOMER SATISFACTION

Banks can know more about existing customers, if banks can create a single view of that customer's transactions, they can spot and predict spending patterns and habits, or see in the data when there are changes in the customer's situation. Using analytics to spot those patterns and changes gives an opportunity to contact the customer (or react better when the customer contacts the bank). The bank can offer more appropriate products, seize on opportunities to cross-sell or upsell, or tell the customer about services that might never, normally have been discussed.

For the bank, there's a chance to lengthen and deepen its customer relationship. Banks have more competitors than ever, as non-traditional services companies such as supermarkets compete to offer financial services. High-value customers have many options when placing their investments for the best returns; to know more about the potential risk and long-term value of existing customers, predictive analytics is essentially required.

QUICK & RELIABLE CUSTOMER ANALYSIS

Predictive Analytics provides a quick and reliable analysis of customers. Imagine the situation that one of the high-value customers gets an annual bonus. Predictive analytics can show that, in the short time that this amount is deposited in the receiving account; the customer is open to offers to invest it. The bank whose systems can spot the bonus, and make the right offer, can win business. The bank that spots the change and contacts the customer in the next quarterly mailing sees little benefit.

On the other hand, imagine a situation in which a customer has moved three times in the last year. Analytics might show that this is a significant predictor of fraud: in which case, when the customer contacts you, it's important to know that risk in the moment of the transaction, not a week later.

CREDIT RISK MODELING

If past is any guide for predicting future events, predictive modeling is an excellent technique for credit risk management. Predictive models are developed from past historical records of credit loans, containing financial, demographic, psychographic, geographic information, etc. From the past credit information, predictive models can learn patterns of different credit default ratios, and can be used to predict risk levels of

future credit loans. It is important to note that statistical process requires a substantially large number of past historical records (or customer loans) containing useful information. Useful information is something that can be a factor that differentially affects credit default ratios.

## CREDIT RISK PREDICTIVE MODELING SOFTWARE TOOLS

Data Miner supports robust easy-to-use predictive modeling tools. Users can develop models with the help of intuitive model visualization tools. Application and deployment of credit risk models is also very simple. CMSR supports the following predictive modeling tools;

- Neural Network is a very powerful modeling tool. It generally offers most accurate and versatile models. It's very easy to develop neural network predictive models with CMSR.
  Network visualization tools will guide users from configuration, training, testing, and more importantly direct application to databases.
- Cramer Decision Tree produces most compact and thus most general decision trees. Decision tree can be used for predicting segmentation-based statistical probability of credit loan defaults.
- Regression produces mathematical functions for predicting default risk levels. It can be very limiting to be used as general-purpose credit risk predictive modeling methods. However when it is used with above methods, it can be a very useful method.

## CONCLUSION

Predictive analytics help Bank enterprises sustain competitive advantage by improving service to customers, increasing customer loyalty, achieving a greater return on promotion campaigns, reducing costs, and improving operational efficiencies. It adds valuable and actionable insight over banking data so that banks can maximize profits and optimize processes. Banking Analytics, or applications of Data Mining in banking, can help improve how banks segment, target, acquire, and retain customers. Additionally, improvements to risk management, customer understanding, risk and fraud enable banks to maintain and grow a more profitable customer base.

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## Banking Finds A Voice

*- Nivedita Narayanan*

Information technology is one of the most important facilitators for the transformation of the banking industry in terms of its transactions processing as well as for various other internal systems and processes. The various technological platforms used by banks for the conduct of their day to day operations, their manner of reporting and the way in which interbank transactions and clearing is affected has evolved substantially over the years. The process of computerisation marked the beginning of all technological initiatives in the banking industry. Computerisation of bank branches had started with installation of simple computers to automate the functioning of branches, especially at high traffic branches. Networking of branches are now undertaken to ensure better customer service. Core Banking Solutions (CBS) is the networking of the branches of a bank, so as to enable the customers to operate their accounts from any bank branch, regardless of which branch he opened the account with. The networking of branches under CBS enables centralized data management and aids in the implementation of internet and mobile banking. Besides, CBS helps in bringing the complete operations of banks under a single technological platform.

CBS implementation in the Indian banking industry is still underway. The vast geographical spread of the branches in the country is the primary reason for the inability of banks to attain complete CBS implementation. Satellite banking is also an upcoming technological innovation in the Indian banking industry. The use of satellites for establishing connectivity between branches will help banks to reach rural and hilly areas in a better way, and offer better facilities, particularly in relation to electronic funds transfers. The major channels of distribution in the banking industry, besides branches are ATMs, internet banking, mobile and telephone banking and card based delivery systems. Banks across the country have started the process of setting up ATMs enabled with biometric technology to tap the potential of rural markets. A large proportion of the population in such canters does not adopt technology as fast as the urban canters due to the large scale illiteracy. Development of biometric technology has made the use of self service channels like ATMs viable with respect to the illiterate population. Though expensive to install, the scope of biometrics is expanding rapidly. It provides for better security system, by linking credentials verification to recognition of the face, fingerprints, eyes or voice.

The future of banking technology could hinge on something that is not difficult to find: The Voice. Voice technology can also be used alongside other forms of biometrics to enhance security. Voice biometrics compares various characteristics drawn from a person's voice such as inflection, pitch, dialect, among others, and matches that with data captured. Voice biometrics provides a multifactor authentication of a person's identity through a unique property: his or her voice. Developments in the field of voice technology mean that such capabilities will no

longer be in the domain of science-fiction and could be commonplace in banking in the next few years. It marks a wider trend of voice-controlled devices. Whether it is speaking to a satellite navigation system in a car – instead of fiddling with a screen while driving – or speaking commands to wearables such as Google Glass, voice recognition is also expected to become more pervasive in a number of banking channels. Rather than typing and swiping through numerous pages of a mobile banking app, for example, the voice can be used to navigate through the options much faster. The idea of biometrics is not new and banks have been experimenting with this kind of technology for years.The use of voice biometrics is also being increasingly used to authenticate users.Mobile banking has exploded, which has made voice authentication technology much more viable. Voice technology has got a lot more intelligent and much more human-like. If you are going to engage with customers in an automated way, you want that capability to be human-like in its interactions.

Nowadays, most banks offer online banking but there's always the threat of criminal and fraud activities. This has prompted many banks to introduce a second authentication for online banking customers. It is important to note that the installations for authentications are very expensive and it is still not stable if a customer loses his or her account password. The voice profile authenticate both phone and online transactions, eliminating the need to remember PIN numbers, passwords. Another advantage is that PINs and passwords could be stolen but the voice remains unique and consistent, making it very convenient to use. Voice can combine what people say and how they say it by two-factor authentication in a single action. Other identifications like fingerprints, handwriting, iris, palm, retina, face scans can also help in biometrics but voice identification is needed as a second authentication that is both secure and unique. Voice can combine two factors, namely, personal voice recognition and telephone recognition. Voice recognition systems are cheap and easily understood by users. Voice biometrics prevent fraud ,in most cases for online banking, users will be prompted to enter the OTP sent to their mobile device to prevent unauthorized access. In addition to literally providing all of your personal details over the telephone before any action can be taken on a user's account, an OTP is again sent to the registered mobile device, and then entered into the IVR (interactive voice response), with the customer listening, in order to verify access. Unfortunately, even with all of these security features in place, banking fraud continues to remain a growing issue among banks in India. Perhaps Indian banks also should increase security and curtail some of the online fraud. A little difference can go a long way in ensuring customer's loyalty and trust, especially when they'll be given the option to use new security features in the future. Introducing voice biometrics would further prevent fraudulent use when using telephone banking. If banks are able to record the voice metrics for specific customer, it would ensure only that customer would be able to access his account. The voice biometrics used in IVR systems offers authentication by voice and caller ID. IVR uses

a sensor to gather data and convert it from an analog to a digital format. The technology allows the human voice to be algorithmically translated into a pattern that is a signature of its own. The adoption of an IVR system is easy because it uses existing phone system, which is entirely possible with most IVR technology solutions available today. It works with basically any telephone system. Voice signatures acquired by using IVR is one of the most often cited perks to using the technology. In contrast to the physical signing of contracts, utilizing voice biometrics in IVR systems has proven to be a much more efficient way of signing contracts with fewer instances of dropout (30-55 percent, by some estimations). Utilizing voice biometrics in an IVR system, the dropout rates go close to zero. The voice biometrics technology in IVR solutions is an incredibly secure and an increasingly effective form of non-invasive identification for business practices. Because it relies on legacy phone systems, it is very easy to deploy.

However, voice recognition is not fool-proof. For instance, a voice software can provide false accepts by clearing frauds to proceed, denying legal users access. The system can be tuned by tightening the decrease of false acceptance but that can also deny the legal users to the account. Loosening the system can make the users happy but one false acceptance can cost the entire bank to be robbed. In this sense, there is an equal error rate for both false rejects and acceptance. It is also important to note that voice recognition and voice verification are different .Voice recognition is aimed toward identifying the person who is speaking and voice verification is the process of using a person's voice to verify that they are who they say they are. These technologies are used differently for authentication purposes. They have to be properly integrated in the system so that financial institutions-bank can offer a higher level of customer service to their clients.

Voice technology also improves customer service. For example, when customers phone their bank, it takes less time for the customer to finish whatever they are trying to do. Voice authentication will allow clients the ability to use their voice as their password as an added layer of security when logging into our mobile app. The advantage of using the voice is that “anyone can use it without training”, which is important when dealing with a wide customer base. As more devices become connected to the internet, it is likely that they will no longer be controlled via screens or a control panel, but rather a voice. A person can walk into the room and say “turn on the lights” or “turn on the heating” in a ubiquitous computing environment where there are no longer interfaces to such technology. Voice authentication will become more powerful as the voice can be authenticated alongside authenticating the mobile device or phone line that the customer is calling from. With a combination of speech recognition, voice biometrics and an intelligent artificial brain, voice technology will no longer be the stuff of science-fiction, but rather an everyday banking experience.

**Nivedita Narayanan**
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# NEW ERA OF ALTERNATE DELIVERY CHANNELS: "INTERNET of THINGS"

*- Meenakshi Srivastava*

ABSTRACT

The Internet of things era is emerging, to thrive in this new world and build and retain a sustainable competitive advantage, today's banks will need to continue to invest in data gathering and analytics capabilities, integrating new external distribution channels and developing an *interconnected network reaching beyond traditional, "bank-owned" channels of today.* Moreover, they will need to invest in building new partnerships with a wide range of organizations to ensure they can obtain the data they need to deliver personalized experience to each and every customer. Those who embrace these opportunities will stand the best chance of becoming a leader, central player in their customers' lives.

## INTRODUCTION

In the upcoming era with the up gradation of various smart devices customers are also changing,now a day customers cannot be defined by traditional demographic factors such as age, gender or income. Customers are hyper-connected, highly informed, very demanding and spoilt for choice. They expect to be engaged as individuals.....the traditional ways of finance sectors for handling them i.e. branch banking, mobile banking, formative calls, e-mails, customer visit no more raises the satisfaction level of customers. They need the information in customized manner and in their terms i.e. when, where and how they want. In response of this argue,

banks are searching for new ways to transform data into insight to better understand their customers and use that knowledge to deliver an outstanding customer experience. Today, more than 10 billion devices are connected to the Internet, enabling us to work, share and collaborate more effectively than ever before. Over the next 10 years, another 10–20 billion items will be connected via sensors, from household appliances to heavy machinery, crops and livestock. This vast application and use of Internet is giving birth to a new revolution era ' Internet Of Things (IoT)'. The Internet of Things includes anything and everything that is connected to the Internet and able to communicate and share information with other "smart" devices. These may include home appliances, fitness and health monitors, home security systems, light bulbs, audio systems, temperature control equipment, etc. Now banking and investment management leverage the IoT technology by accoutring the power of the Internet of things, banks will be able to change

their role in the life of their customers and evolve into delivering an unprecedented level of data and data-driven customer insight. This will allow banks to provide their customers individuals and businesses alike a truly bespoke experience, with insights, advice and offers that reflect the day-to-day events in customers' lives. The Internet of things is the key factor that will enable a bank to fully transform into a Bank of things.

NEW HOPES AND SCOPE:

The Bank of things will anticipate customers' needs and respond to their changing circumstances, offering timely, relevant solutions that assist them to achieve their goals. It will remain a trusted advisor, facilitator and value aggregator for its customers yet it will do so with an almost intimate understanding of each customer's needs and preferences.

No longer will farmers and their banks need to rely on past performance as a guide to financing and payment schedules. Data will allow the Bank of things to calculate flexible, proportionate repayments based on current conditions and the resulting forecasts even taking into account unforeseen events such as natural disasters. The result will be a better financial position for the farmers and a stronger relationship with the bank.

For instance, imagine a personal health monitor that is also connected to your investment account. At the sign of any serious health hazard (say a heart attack), the investment account could automatically rebalance to limit your downside exposure, or transfer your holdings to more liquid securities, in anticipation of future cash needs. This may sound a bit far-fetched now, but is not completely out of the realm of possibilities.

Wellington based Michael Dutton is a Senior Experience Designer with Optimal Experience and believes IoT gives banks the opportunity to offer amazing customer experiences, “because they know more about me than I know myself.”

CHANGE IN SCENARIO:

Banks must retain their traditional place as a trusted advisor. But in the future they must strive to deliver tailored, personalized advice that meets the customer's financial and non-financial needs when and where the customer wants it.

Banks must become a key part of their customers' ecosystem and social community. They will achieve this by developing special alliances and partnerships that enable them to provide exclusively priced offers that appeal to value-seeking customers. Banks must use their relationships with customers to connect them with other service providers from insurers and health practitioners to airlines and hotels that deliver relevant, tailored offers that support customers' needs and lifestyles. Banks must retain their

traditional place as a trusted advisor. But in the future they must strive to deliver tailored, personalized advice that meets the customer's financial and non-financial needs when and where the customer wants it.

ACHIEVING NEW STANDARDS OF BANKING:

Powered by the Internet of things' vast data flow, the Bank of things will be an ever-present part of customers' lives and daily routines. New heights.

Personal Banking Accessing: The data captured by smart devices of all kinds will enable the Bank of things to provide customers with a holistic view of their personal finances, updated in real time. Banks can use their data-driven insights to anticipate customer needs and offer advice, products and solutions to assist customers make smart, financially sound decisions. In this way, the Bank of things becomes an ever-watchful, always useful advisor and facilitator, building customer loyalty and increasing the likelihood of additional business.

Business Banking: The successful business banks of the future will be those that help their customers achieve superior commercial results. By accessing data from across their business customers' value chain, from suppliers to distributors to retailers, the Bank of things will be able to develop much deeper customer insights. This will allow banks to provide financial analysis, products and services that enable their business customers to gain a competitive edge in a highly connected, hyper-competitive market.

Primary Industry Banking: The Internet of things will allow agricultural businesses to track their performance with unprecedented accuracy. Real-time data feeds will allow farmers and their banks to continuously and accurately assess the health of the farm's crops and livestock; and more accurately gauge expected yields, property and overall business value.

MILE STONES:

Today's banks need to invest in developing the natural environment and capabilities that will drive tomorrow's Bank of things.

- The Right Partnerships: Need to collaborate with ecosystem partners to extend reach and integrate products into all areas of their customers' lives. These partners could include other financial services institutions, mobile payment innovators, utility companies, telecom companies, retailers or technology firms.
- Collective Data Analytics: Customer insights drawn from bank's internal analytics structures will continue to form the backbone of strategic business decisions, however the Bank of things will only be able to deliver a truly complete, personalized and integrated customer experience when it aggregates data with all ecosystem partners.
- Connectivity : Create a seamless,

consistent experience across multiple channels to deliver a superior customer experience and drive enhanced revenue opportunities.

SECURITY THREAT AND SOLUTION:

We have already seen the products that use sensing and communication technologies in a range of consumer sectors, such as self-driving cars and geospatial sensing on mobile phones. We are also seeing applications in business, with supply chain management being a focal area.Banks will need to invest in developing their agility and capacity to utilize the opportunity being provided by the Internet of Things so they can evolve and adapt to these shifts. The problem lying there is that such innovations also come with new risks. The deluge of new data is likely to complicate data management for financial services firm. And of course, cyber security may become an even greater challenge. One solution for banks in particular, is wearable technology, providing an immediate opportunity. Wearable could allow new forms of security and authentication (fingerprints, heart beats, DNA) while it also has potential for messaging. Alerting someone of an account being compromised or seeking confirmation of a large withdrawal is bound to get picked up a lot quicker by a customer through a vibration on a wrist device then waiting for someone to respond to a text or email.

CONCLUSION:

With the upcoming era of Internet of Things financial bodies will get access to an unprecedented level of data and data-driven customer insight. This will allow banks to provide their customers advice and offers when and where required to the customers in the day-to-day events of their lives. This phenomenon will introduce an inter-connected network which will allow banks to reach to the customers beyond their traditional, “bank-owned” channels.

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# CREDIT DEFAULT SWAPS: LENDER'S BOON

*- Pankaj K Agarwal*
*- CA Neeraj Agarwal*

Recent move by RBI seeking out the opinion of select bankers on introduction of Credit Default Swaps in India has raised many eyebrows. More infamous than understood, this instrument has been blamed for exacerbating the global financial crisis by abetting downfall of giants like AIG. In spite of this the RBI move is being seen as an attempt to put life into moribund secondary market for corporate bonds. Since the CDS evolved as a credit derivative instruments lot of action has been seen in other emerging markets. South Korea and Brazil have been among the most actively traded countries with Venezuela trailing not far behind.

In the developed world, the rapid growth of credit default swaps market led to a fundamental change in the trading pattern in the markets especially the Eurobond markets. Investors became more comfortable with CDS after a number of prominent corporate defaults in 2001 and 2002 proved utility of these new credit derivative structures. Since the CDS allowed investors to take long and short positions in individual issuers, a number of new players, mainly credit hedge funds, have taken advantage of this. It resulted into rapid shifts in buying and selling pressure and volatility of credit spreads.

CDS is akin to insurance on the price loss of an investment due to default. In a CDS of a given credit, counterparty A pays counterparty B a periodic payment (CDS spread) which can be thought of as an insurance premium. In exchange party B agrees to pay par for one of the issuer's eligible bonds should a default occur. It is similar to making a claim on insurance policy. These counterparties are generally referred to as "protection buyer" (who pays the premium) and "protection seller" (who makes the contingent default payment or buys the eligible bond for par in the event of default). The CDS contracts specify what credit events are considered default, for purposes of making the contingent claim, and what assets are deliverables for par. The documentation used is from International Swap and Derivatives Association (ISDA).

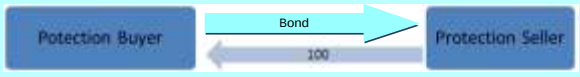
The mechanics of Credit Default Swap can be shown here:

Between trade initiation and default or maturity, protection buyer makes regular payment of default swap spread to protection seller.

Following the credit event one of the following will take place:

Cash settlement


Physical Settlement




The mechanics of a CDS can be understood with the diagram. The protection in a CDS contract lasts until some specified maturity date. To pay for this protection, the protection buyer makes regular payments to the protection seller on what is known as premium leg. These payments last until a credit event occurs or maturity date, whichever is earlier, and are quoted in term of an annual CDS spread. The actual payment amounts on the premium leg are adjusted for the frequency, usually quarterly, using a basis convention that is usually actual/360.

If a credit event occurs before the maturity date of the contract, there is a payment by the protection seller to the protection buyer. This leg is called protection leg. This payment equals the difference in value between par and the price of cheapest deliverable asset of the reference entity calculated on the face value of the protection. It therefore compensates the protection buyer for the loss associated with holding the same face value of an asset of the same reference entity. The protection buyer also typically will pay the portion of premium that has accrued since the previous payment date and the time of credit event.

The credit events covered by CDS frequently, as per ISDA and prevailing practices include bankruptcy (Corporate becoming insolvent or unable to pay its debts), Failure to Pay (Failure of reference entity to make due payments, allowing for some grace period), Restructuring (Changes in the debt obligations of the reference creditor but excluding those associated with credit deterioration), Obligation acceleration or Repudiation or Moratorium.

Following the credit event, there are two ways to settle the payment of the protection leg, the choice being made at the initiation of the contract. They are physical settlement and cash settlement. Of the two physical settlements is most widely used procedure. It warrants the protection buyer to deliver the notional amount of deliverable obligations of the reference entity to the

protection seller in return for the notional amount paid in cash. In general there is a choice of deliverable obligations from which the protection buyer can choose that satisfy a number of characteristics. They include restrictions o the maturity and the requirement that they be pari passu- most CDS are linked to senior unsecured debt. Especially in case of restructuring event, the protection buyer may take advantage of this situation by buying and delivering the cheapest asset.

Cash settlement is not a standard settlement method in CDS; it is a preferred alternative in default baskets and synthetics Credit Default Obligations. In cash settlement, a cash payment is made by the protection seller to the protection buyer equal to par minus the recovery price of the cheapest-to-deliver reference asset. The recovery rate is calculated by referencing dealer quotes or observable market prices over some period after the credit event has occurred. Economically speaking, this should have the same value as physical settlement.

Globally the CDS has revolutionized the credit markets by making it easy to short credit. It can be very useful for those wishing to hedge current credit exposures or those wishing to take a bearish credit view. Since CDS are unfunded, there is a possibility of leverage. It may be used for locking in an interest rate liability if huge funding costs are present. The most attractive feature of CDS is there customizability in terms of maturity, seniority and currency. Also, just as a bond can be sold to realize a gain or loss owing to spread movements, a CDS contract may be unwound in order to realize some mark-to-market gain or loss owing to changes in CDS spread. It has been seen that liquidity in CDS market has been traditionally better than cash market.

CDS are used to hedge existing credit exposures in the portfolio and to create new exposures that could not be created otherwise, for example, taking a short position to express a negative view. A conventional corporate "cash" instrument, for example, a regular corporate bond bundles together exposures to interest rates, swap spread, credit spread and may be currency risk also. CDS allow investors to pick from this bundle of exposures only the desired ones.

It may be hoped it will contribute to the development of a healthy corporate bond market in India.

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## CLOUDING: FACES BEHIND THIS ACE TECHNOLOGY

*- Manisha Singh*

In today's world there are billions of new technologies that are developing every single day and most of them have a common thread CLOUD. Apps, softwares, organization etc are on Cloud. So basically Why Cloud is trending so much ?? Definitely there must be some reason and I am going to find it for you.

### WHAT IS CLOUD?

"Cloud is the new style of elastically scalable, self-service computing, and both internal applications and external applications will be built on this new style,"

Now this is the official definition on Cloud Computing and frankly speaking I never understood any such definitions using heavy words so according to me in very layman language" Cloud Computing is like renting a place use it for time span according to your choice that its FREE OF COST for some initial period like one year and who doesn't like free things..."

Store your data use it whenever you want nowsday, memory is one of the most important things for most of the gadgets be it smartphones, laptops, notebooks etc and cloud solves this problem.

### THE TECHNOLOGY BEHIND CLOUD COMPUTING

Though there are lots of pillars holding cloud computing but one of them plays a major role i.e. VIRTUALISATION.

Virtualization is, from the user's point of view, the capability to carve a computer up into pieces such that the software running on each piece has no way to detect that it is not running on its own dedicated hardware. This feat of seeming magic is the result of a combination of hardware features in the computer and software systems that abstract (or hide) the physical characteristics of the computer hardware from the running software. By hiding the hardware, it becomes possible to run many software systems on a computer at once without any of them being allowed to interfere with each other or the operation of the hardware, and to move software from one virtualized computer to another without any change. These software systems can be operating systems, such as Windows or Linux, each themselves capable of running many programs. With proper security, each operating system can serve a different user or group of users, and the computer can then be carved up among completely different users that don't have any relationship to one another.

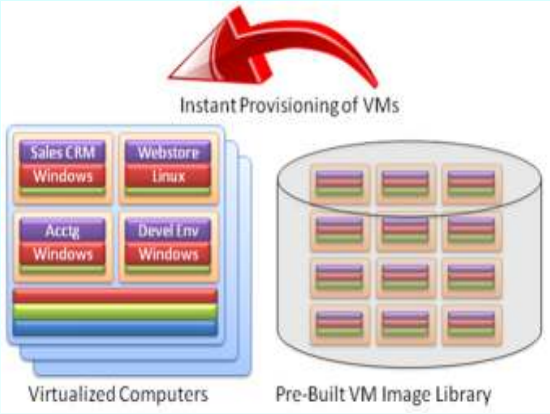
Now here, we are going to talk about all those important pillars that plays a vital role in Cloud Computing.

### VIRTUALIZATION – TECHNICAL OVERVIEW

Virtualization technologies partition hardware and thus provide flexible and

scalable computing platforms. Virtual machine techniques, such as VMware2 , and Xen3 offer virtualized IT infrastructures on demand. Virtual network advances, such as Virtual Private Network4 (VPN), support users with a customized network environment to access Cloud resources. Virtualization techniques are the bases of the Cloud Computing since they render flexible and scalable hardware services.

Non-Virtualized (Physical) Computer




THE IMPORTANT THINGS TO REMEMBER ABOUT VIRTUALIZATION ARE:

1) It abstracts the hardware so that all computer systems look the same to software running in a virtual machine, allowing the same software to be easily deployed on different systems, and making all systems look identical to the software.
2) It allows creation of a number of virtual machines on each server, each of which may run completely unique software including different operating systems.
3) It shares the hardware resources of the computer in such a way as to prevent any VM from impacting the performance of another (though of course they must each receive a fraction of the underlying hardware's resources that may add up to no more than 100% of the available resources.)
4) Because the VMs don't “know” about each other since they cannot see each other (except on the network), each VM is secure from the other VMs and can serve users who do not want other users on the same computer to know they are there. VM security is generally accepted to be as good as the security between two different physical computers.
5) The hypervisor allows creation, management, and deletion of virtual machines including setting the hard-

ware resources assigned to each VM. This management can be initiated from a user interface or programmatically.

6) Pre-built VMs, called Virtual Machine Images, can be easily loaded into the computer by the hypervisor, allowing almost instant provisioning of software applications.

Because of virtualization, it became possible to divide the resources of a physical server up among different paying customers according to their needs, while keeping the customers secure from each other's software. This capability has allowed service providers to lease computer time very flexibly, only charging customers for what they requested or allocated, and changing that allocation on demand. In addition, customers could rapidly deploy their software to a virtualized server by copying pre-built images into it.

OTHER REQUIREMENT: INTERNET

Obviously, its not possible without Internet. Its another important requirement and everyone knows what internet is "It's a web".

Now you may be asking yourself, what's so new about the Internet? It's been around for 20 years! However, there has been a significant change in the last few years: large numbers of people have been connecting to it with broadband connections and cell phones, instead of the slow dial-up lines used in the 90s. This growing population of broadband-enabled users are capable of doing much more with the internet and create a market for media, web applications, social networking, and web-delivered software services that has driven an explosion in the managed hosting and leased-server industry. As more and more people create web-facing software, the demand for easy-to-use hosting and web servers has increased. In addition, the demand for these web-based services as well as the relative ease of creating them and securing funding for startup companies that deliver them has reinforced the demand for managed hosting.

INSHORT, The combination of virtualization, which allowed managed service providers (hosting companies) to make dramatic cost reductions with shared hardware as well as greatly improving the ease of deploying customers' software systems onto hardware, and the sudden increase in demand for managed hosting due to mass adoption of broadband internet, created an opportunity to sell self-service, pay-as-you-go, easily adjustable computing to millions more customers. Than ever before, at lower prices than ever before. This was the perfect storm that drove the creation of Cloud Computing.

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**VIII Batch**

## Remedial Measures to Prevent Banking Cyber Frauds

*- Satyendra Sharma*

"Awareness is the only defense"

- Banks/RBI/Income Tax Department/Police Authorities/Call Centres do not ask your financial and personal sensitive information like Account number/Card number/PIN/ email ID and Password/ mobile numbers/OTP/CVV/3D secure code/ Internet Banking User ID and Password/Challenge Question's Answer/Date of Birth/Answer of security question etc. through e-Mail/Phone/Chatting/SMS. Therefore, any one pretending to be asking you for information may be fraudulent entities. DO NOT Disclose such information to them.

- Any caller pretending to be from Bank /Call Centre/RBI may persuade you to reveal your credentials like Card number/PIN/OTP/3D secure code/Internet Banking User ID and Password/ Challenge Question's Answer/Date of Birth/Answer of security question etc stating that "provide the same otherwise your account/Card will be Blocked". Do not entertain such requests as they are fraudulent entities and immediately inform to your Bank and lodge the complaint in cyber crime cell.

- In case your mobile is deactivated without your request or you get a call in this regard, somebody may be trying to get a duplicate SIM/steal your credentials like OTP (One time password) etc. for online transaction(s)/beneficiary registration/for issuing online Internet Banking/creating 3D secure code/resetting password. In this case, immediately contact with the Mobile Service Provider and also check your Bank account statement.

- In case of any of these suspected activities, please Change your Passwords/PIN immediately on any such suspected activity as frequently as possible.

- Do Not Write ATM PIN on ATM Card/Debit Card/Credit Card.

- Do not disclose your user ID/password/ PIN/OTP/ other secret code to anyone.

- When using an ATM or POS Machine, always shield the keypad. If you feel that somebody is standing too close, don't be afraid to tell the next person who is in line to step back. If you feel uncomfortable, allow the other person to go first and complete your transaction once he/she has left.

- Always inspect the ATM you are using. Some fraudulent card reader devices (Skimmers) can be easily spotted. If some parts around the slot for inserting the card do not seem right, inform to the concerned Bank/Security Guard and consider walking away and transact in another machine.

- Do not take assistance of Stranger to withdrawal money from ATM. Your card may be swapped/ exchanged.

- If your ATM is hanged after entering ATM PIN, then immediately call to the Bank for assistance and DO NOT leave the ATM Room in any circumstances. Miscreant(s) may suggest you to use other ATM by saying that ATM is having problem and not working. In case, if you leave the ATM room, miscreant may withdrawal money from your account because you have already entered the ATM PIN.

- Avoid ONLINE transactions in Cyber Cafe/Kiosk.

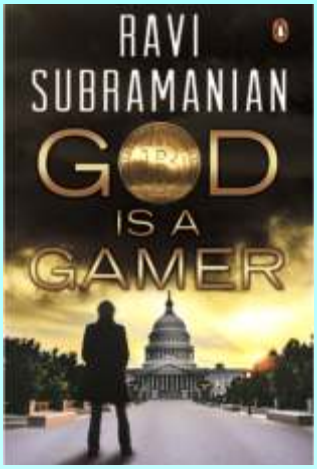
- Always protect your application/system using strong password with combination of alphanumeric and special character(s)

Author is
(Certified Cyber Crime Investigator)
Sr. Manager- IT

## Book Review

### Title: God is a Gamer

- Author: Ravi Subramanian
- Publishers: Penguin
- ISBN: 978-0-143-42139-9 • Genre: Fiction
- Pages: 309 • MRP: Rs. 299




Described as the 'John Grisham of banking', by the Wall Street Journal, Ravi Subramanian, is an alumnus of IIM Bangalore. This book “God is a Gamer” is a fast-paced thriller that spans continents and has a generous mix of characters including the FBI, CBI, and the White House.

The book begins with an intense discussion between two corporate honchos, Vijay Banga, President of Mastercard International and Joseph Saunders, the CEO of Visa International. The chapters are arrayed based on the location of events, moving from Washington's Congress to Delhi's finance ministry, the beaches of Goa to the corporate boardrooms of Mumbai, with Mumbai and Washington DC gaining primary importance due to the plot. After a year, Wikileaks shakes the core of the US Government. Simultaneously, there is a dark world, growing by the day and run by the dark virtual currency in the online world, called the Bitcoins which is turning people's life upside down. Bitcoins come in to the picture and soon after there's an explosion killing a bureaucrat pushing FBI into a vortex of mad chase. The reader is exposed to the power play that takes place in Corporate boardrooms and political corridors. A female head of a powerful bank who is involved in money laundering, dalliances with a Finance minister and finally ends up dead (is it a suicide or a murder??). The LTTE has unleashed terror in America that sends the FBI on a wild goose chase, bringing them to Mumbai. Enter Varun, part time drug dealer and full time genius. He turns around the gaming company before disaster strikes.

The plot is tight and pushes a reader to skip a couple of pages to know what's going to happen next and who is pulling the strings. There is love, lust, lies and secrets in various shades adding new dimensions to the story. For those who are looking for a banking pot boiler, well, let me just tell you know that this book is not high on it though banking does play an important part in the plot. However, if you love games you will be in for a surprise. The gaming angle and Facebook are given ample coverage. The role of social media in marketing anything and everything is brought under the lens. Plus there are the situations which cater to the Indian mindset too. The meeting between a father and a long lost son, the son helping the old man out with his latest venture, the father's unshakable faith in the son's ability to deliver, a romantic angle, an honest man getting bumped off because he chose to depose against a powerful figure. This and a lot more, God Is A Gamer is a roller coaster ride with many surprises and shocks in equal amounts. There is a new revelation in almost every chapter and that is what sustains one's interest throughout the book. A twist in the end delivers the knockout punch.

The book is packed with an adrenaline rush which will not let you sleep till you finish reading it. Using real names of companies and people wherever possible has given the story more acceptability. A must read if you are crazy about thrillers that draw heavily on technology and for this author has left no stone unturned with his research and it shows in the book.

Sanjay Srivastava, Librarian at PNBIIT

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**PLACEMENT RECORD :**

- ✓ Excellent Track Record Of Campus Placement.
- ✓ Past recruiters include NPCI, ICICI Bank, HDFC Bank, PNB, Vijaya Bank, UBI, Dena Bank & HP, FSS etc.

(Disclaimer: Institute does not guarantee placement)

**GENERAL INSTRUCTIONS** : For placement information, applicaiton form and prospectus visit Institute's website: **www.pnbiit.ac.in**


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PNBIIT, Established in 2002, is an independent society promoted by Punjab National Bank to promote training & education in BFI sector with focus on IT.