

Technological changes: Recent trends and challenges in banking sector

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Received: February 10, 2019

Accepted: March 18, 2019

ABSTRACT: Indian banking and digital banking system are connected and it is continuously evolving. Today with the introduction of cashless economy, central identity service Aadhaar, Payment infrastructure revamp with UPI, Telecom providers acting as banks, payments bank like PayTM, emergence of FinTechs (Financial Technologies) and introduction of private agencies to deal with digital payments have given a new horizon to digital banking services. The importance of Cloud banking, Big Data Analytics and Artificial intelligence is increasing day by day.

Key Words: Cloud banking, Big Data Analytics and Artificial intelligence

1. Introduction

Indian banking and digital banking system are connected and it is continuously evolving. The introduction of cashless economy, central identity service Aadhaar, Payment infrastructure revamp with UPI, Telecom providers acting as banks, payments bank like PayTM, emergence of FinTechs (Financial Technologies) and introduction of private agencies to deal with digital payments has given a new horizon to digital banking services.

Cloud computing is making its presence felt in almost every business sector across the globe and the banking sector does not want to be left behind. Banking transactions can change for the good and in a dramatic manner if some barriers associated with the technology are brought down. Even the cost of cloud computing can be significantly reduced and more flexibility introduced into the system if the right software and hardware resources are provided (Anbalagan, 2017).

2. Review of Literature

In the research article "Impact of Big Data Analytics on Banking Sector: Learning for Indian Banks" states that during a four year period the introduction of big data has created a great change in the banking sector and usage rate of online purchases among the customers (Utkarsh Srivastava, 2015)

In the research work of Chandani A, the researcher has done comparison between the traditional tools and Big Data tools over a period of five years and gave the values of the most popular and widely used tools in the world of finance to enable managers in decision making. According to the researcher Big Data is the most popular amongst all the data handling tools and techniques (Arti Chandani, 2015).

Researcher in an article titled "Suitability of Big Data Analytics in Indian Banking Sector to Increase Revenue and Profitability", Big Data is considered as an efficient way in which customer sentiments can be captured and used to benefit banks. Implementation of Big Data will be crucial to address many opportunities and threats arise in new evolving environment of banking. Current market is the right place and time to invest in Big Data Analytics, for a better satisfaction of customers. For successful identification and implementation of Big Data and to get benefit values from Big Data, banks need to be upgraded in terms of resources that need extra time and money. The adoption of big data can not only help in increasing business but it can be used in fighting fraud and misuses of the data and resources (Utkarsh Srivastava, 2015)

3. Big Data

Big data is a term that describes the large volume of data that include both structured and unstructured which inundates a business on a day-to-day basis. But it is not the amount of data that is important; it is what organizations do with the data that matter. For a better decision making and strategic business big data can always come in handy.

The concept of big data is relatively new, the act of gathering and storing large amounts of information for eventual analysis is ages old. The concept gained momentum in the early twentieth century when industry analyst Doug Laney articulated the now-mainstream definition of big data as the three V's- Volume, Velocity,

and Variety. Banks collect data from a variety of sources, including business transactions, social media and information from sensor or machine-to-machine data which constitutes the volume. Storing data would have been a problem in earlier days, but new technologies have eased the burden (K Sudhakar, 2014).

Velocity explains the data stream at an unprecedented speed and which must be dealt with in a timely manner. Sensors, Radio-frequency identification (RFID) tags, and smart metering are driving the need to deal with torrents of data in near-real time. Variety states that data come in all types of formats, from structured, numeric data in traditional databases to unstructured text documents, email, video, audio, stock ticker data, and financial transactions.

The importance of big data does not revolve around how many data one has, but what you do with the information. It has eased the task to take data from any source and analyze it to find answers that enable cost reductions, time reductions, new product development and optimized offerings, and smart decision making. When any organisation can combine big data with high-powered analytics, organizations can accomplish business-related tasks such as determining root causes of failures, issues, and defects in near-real time. It can also check on generating coupons at the point of sale based on the customer's buying habits. Ease on checking or recalculating entire risk portfolios in minutes. Detecting fraudulent behavior before it affects the bank (A V Nikam, 2015).

The main benefit of Big data is 360-degree view of the customer and frictionless experience. Capacity to handle this scale and volume of data and managing the storage capacity becomes the key. Time-to-market becomes important for sustenance and hence dynamic provisioning of infrastructure is the way forward. Conventionally networks and data centers have been too complex and hardware-driven to respond to rapid changes. Currently banks are exploring to automate the management and configuration of virtual networks based on high-level tenant requirement specifications, which are called intents. The future depends on Intent-based networking based on SDN protocols, using intelligence, automation, and control from a software layer over the network.

Analyzing this huge data to create real-time customer profiles for hyper-personalization, demands supercomputing power to generate real-time contextual offers. Accordingly the number of devices on enterprise networks multiplies; the streams of data flowing in the data-lake grow multi-fold. Overloading should be avoided, as the infrastructure becomes critical and capability to have intelligent edges to filter this data becomes paramount. Introducing Cloud-based computing power to the edge becomes critical. Processing should ideally be focused on concentrating data, analysis of the data for building the context, and then leveraging it to arrive at key decisions.

With some of the compute-intensive workloads shifted to cloud and conventional workloads still remaining on premise, the integration becomes challenging, unless the enterprises have invested in a robust Application Programming Interface (API) platform. Banks if make space to get a few racks of servers, they can use cloud services, a provider creates a seamless cross-connect to the environment these are the benefits of the system. Application Programming Interface platform will not only make the transition between cloud and on premise seamless, but also built-up avenues for constructing complex, multi-entity business models. This will also bring in cost and operational efficiencies (Saravade, 2017).

One of the main treats of becoming more complex is that, with large amounts of information streaming in from countless sources, banks are faced with finding new and innovative ways to manage big data. While it is important to understand customers and boost their satisfaction, it is equally important to minimize risk and fraud while maintaining regulatory compliance. Big data not only brings in big insights, it also compels financial institutions to stay one step ahead of the game with advanced analytics.

3.1. Big data in Indian Scenario

Handling of data will play major role in success of digital banking by way of delivering competitive advantage and determining future winners. More importantly, a bank's data and analytical capabilities will be central to staving off multiple challenges-such as data silos and lack of integration, both of which limit insight-facing traditional banking structures and models. Banks are trying to overcome their four biggest challenges, linked to customers, competition, fraud and compliance, will find many solutions in advanced data and analytics technologies.

HDFC Bank was the first bank in India which started using Big Data in the most effective way in the early 2000. They installed a data warehouse and started their investment in technology that would help it make sense of massively stored unstructured data by its Information technology systems. Later on, ICICI Bank had also adopted Big Data in the similar way as HDFC Bank. These banks were looking at Big Data analytics as a tool to get profits by generating more revenue, as they get valuable intuition for customers and markets. For Banks like HDFC and ICICI, data is generated through multiple channels like voice call logs, emails, websites,

net banking, social media, and real time market feeds. Using analytics these banks were also able to keep records of credit histories of customers and can handle loans accordingly.

India's demonetization followed by financial digitization of its economy has substantially become a reason to the high volumes of data that are generated by global social media and the growing number of smart phones. Big data refer to datasets that are not only big, but also high in variety and velocity. Big data deal with the information management strategy with many new types of data and data management along with traditional data. Demonetization-to-digitization is playing significant role in revolutionizing the banking sector resulting into more avenues for Big Data industry in India(Nitin Gupta, 2017).

Introduction of recent demonetizationopened a new era, accelerating rapid growth in e-Banking and e-Commerce in India. Demonetization was followed by strict orders by the government of India forpromoting digitization for a cashless society paving way for increased e-Banking and e-Commerce transactions. In an era when banking is highly digitized – the mining of Big Data provides a massive opportunity to stand out from the competition.Through using of data science for collecting and analyzing Big Data, banks can improve, reinvent, every aspect of banking. This change and introduction of new methods can enable hyper-targeted marketing, optimized transaction processing, personalized wealth management advice and more. The changing trends can also help strengthen risk management in areas such as cards fraud detection, financial crime compliance, credit scoring, stress-testing and cyber analytics (Ayesha Anam Siddiqui).

Demonetization-to-Digitizationdrive is playing crucial role in widening the sphere of ATM network focusing on rural India. Debit Cards are given to thebank customers having saving or current account in the banks. The customers can make use of this card forpurchasessuch as goods and services at different places instead of liquid cash. The amount paid through debit card is automatically debited from the customer's account(Ayesha Anam Siddiqui). The number of customers using net banking facilities and mobile apps are growing per minute. One of the major attraction for the customers are the ease of paying utility bills online, money transfer, making fixed deposit, buying insurance policies are attracting customers. Currently more and more people are using mobile phones as phone banking is possible through mobile phones. Through mobile phone a customer can receive and send messages from and to the bank in addition to all the functions possible through phone banking(Garg, 2017).

Consumer behavior complexity has become much bigger after demonetization. Big data concept is a good one, but applying that data to specific business problem is still something that has to be perfected. Demonetization could aid a smooth transition to the GST. The new changes due to demonetization and GST canhike a new higher normal tax-GDP ratio by pushing it from the current level of sixteen to seventeen per cent of GDP to twenty percent in the medium term by formalizing the informal sector. This can in turn enhance the financial capacity of the government to deliver basic services to thepeople.

Indian Internet user's base will double in the coming three years. The major share of India's economy moving through the digital rush will in turn bring changes inoverall growth. Demand will rise to make availability of public infrastructure in terms of bandwidth, connectivity and the penetration and performance of smart phones.

The major threats banks will face in the next year is synthetic identity fraud. Fraud of this kind differs from traditional identity theft in that the perpetrator creates a new identity rather than stealing an existing one. The main ways through which it is done is by creating online deposit and loan origination by fake people to open digital accounts that pass all of the usual security checks. This kind of crime is costing banks billions of dollars and countless hours as they chase down people who do not even exist. In coming days, banks will need to get better at sorting the real customers from the fake, without undermining the benefits of a great digital customer experience (Shriya kumari).

3.2. Benefits of Big Data in banking sector

Big data system helps to find out the root cause of issue and failures in the system it is being implemented. It helps in identifying the most efficient channel for a particular customer. Recognizing the most important and valuable customer from the data base. Big data can check and prevent the fraudulent behavior patterns. For analyzing the risk and the risk profiling the system can come in handy. The system can help in introducing customized products and customized marketing communication according to the need of the banks. Through these features it can help in optimizing human resources. By use of big data it will be easy for banks to retain customers.

4. Cloud Computing

Cloud computing is an advanced Information technology that allows individuals and organizations to utilize the internet for tapping into robust hardware and software programs and tool. The resources from where

they can utilize these services are usually powerful and sophisticated computers placed in remote locations for safety purpose.

One of the biggest stumbling blocks of utilizing cloud computing technology in the banking sector is security concerns. As every transaction has to be done under the cover of high security and confidentiality, banks believe that they could be working incessantly under risk and threat of security breach. Dealing with regulations and complications of handling a large network of customers using the technology are other factors that prevent many financial institutions from embracing cloud computing.

Leading companies are of the opinion that cloud computing can play a pivotal role in formulating powerful strategies. With the technology already proving to be a great success across diverse business sectors, clients want banks to utilize cloud computing to improve services and provide greater connectivity. They believe that this can be easily achieved by using standard cloud technologies. Adoption of cloud computing on a large scale by the banking sector could enhance greater productivity, improve performance and boost profitability. This can help create numerous new jobs which is great news for the economy. It can be innovatively utilized to bring in greater efficiency across all operations and to deliver superior customer service. At a time when banks are facing intense competition from non-bank payment providers and there is high pressure to deliver results, using cloud computing technology can be the best solution to overcome current setbacks and surge ahead.

4.1. Benefits of the cloud banking.

Cost reduction:Banks are spared from the hassle of investing in dedicated hardware, premium software and skilled professionals, moving to the cloud can prove to be a major money-saver. Most providers offer free update for the cloud and Information Technology (IT) infrastructure. Using the pay-on-demand model, banks will have to pay only for technology that is needed for smooth functioning of day to day operations.

Offers high flexibility and scalability: Introduction of cloud technology, banks can keep pace with the changing market and respond to needs of clients faster than before. Technology can also be utilized on a need basis thanks to the high scalability and flexibility associated with cloud technology.

Improves efficiency:The newer and user-friendly technologies easily accessible, banks will be able to optimize utility of all resources effortlessly. The cloud also makes it easier to integrate newer technologies and applications within the system for achieving better results in the future. Most of the key tasks are simplified; efficiency is the major gainer of employing cloud technology.

Helps serve clients better and faster: With cloud computing solutions customized for banks, professionals can create bundled products and services easily. If one needs a specific type of hardware or software solution, you can simply go ahead and develop it instead of having to wait for a long time. Computing power can be increased to meet growing demands of the industry. Clients can benefit immensely as key services can be delivered speedily. Unlimited computing power of the cloud will allow banks to develop systems capable that can make them understand the needs of the clients better. They can create customized solutions that can help them offer high quality services consistently.

5. Artificial Intelligence

The term Artificial intelligence (AI) is an area of computer science that emphasizes the creation of intelligent machines that work and reacts like humans. Some of the activities that can be designed for computers with artificial intelligence include:

- Speech recognition
- Learning
- Planning
- Problem solving

India's largest public-sector bank that is State bank of India with more than four hundred and twenty million customers is embarking on its AI journey from the point of view of both employees and customers. For adding effect to the AI mission, State Bank of India launched a national hackathon, "Code For Bank", for developers, startups and students to come up with innovative ideas and practical and economical solutions for the banking sector, focusing on technologies such as predictive analytics, fintech/blockchain, digital payments, IoT, AI, machine learning, BOTS and robotic process automation. State Bank of India is currently using an AI-based solution developed by Chapdex, the winning team from its first hackathon.

One of the main attractions of HDFC Bank is that it has developed an AI-based chatbot, "Eva", built by Bengaluru-based Senseforth AI Research. Since its launch in March this year, Eva (which stands Electronic Virtual Assistant) has addressed over 2.7 million customer queries, interacted with over 530,000 unique users, and held 1.2 million conversations. HDFC is also experimenting with in-store robotic applications. HDFC's IRA (stands for Intelligent Robotic Assistant) robot.

India's second-largest private sector bank that is ICICI Bank has deployed software robotics in over two hundred business processes across various functions of the company. It seems that it is referring to what is often called as "robotic software" that is a kind of software generally focused on automating office work. This type of software robots now performs more than one million banking transactions per working day. The new system of software robots inbank areprogrammed to capture and interpret information from systems, recognize patterns and run business processes across multiple applications to execute activities, including the process of validation of the data entry made, automated formatting, multi-format message creation, text mining, workflow acceleration, reconciliations and currency exchange rate processing among others. ICICI Bank launched its AI-based chatbot, named iPal. Since its launch, the chatbot has interacted with 3.1 million customers, answering about 6 million queries, with a ninety percent accuracy rate.

One of the main players such as Axis Bank launched an Artificial intelligence and Natural Language Processing(NLP) enabled app, Conversational Banking, to help consumers with financial and non-financial transactions, answer for frequently asked questions and get in touch with the bank for loan and other products. These innovative changes are currently available on Facebook and the Axis Bank website and it is been extended to mobile banking channels as well.

6. Conclusion

The growing market and increasing ease of using advanced technologies have paved way for more effective utilization of resources and time. Introducing and utilizing the new technologies even come with some challenges, still the positive side is vast more appreciable. Indian government as well as the organizations must make new changes in the rules and infrastructure to utilize the full potential of new technology innovations.

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