

## **The Impact of Data Mining Techniques on the Indian Banking System**

**ANUPRIYA**

Asst. Professor, School of Computing, Graphic Era Hill University, Dehradun Uttarakhand India 248002,  
anupriya@gehu.ac.in

### **Abstract**

A definite transition away from the current post-industrial civilization towards the "Knowledge - based society" is being brought about by the influence of the "information Revolution" that is shaking the sphere. The banking and finance sector which consists of banks, financial firms, and other providers of financial services, is increasingly adopting new ICT developments (ICT). ICT adoption by banks has clearly benefited the banks in the form of improved customer service, reduced transaction expenses, a larger variety of delivery options and goods, etc. All banks are using fintech (Fin Tech) more and more. India particularly has experienced a period of demonetization (DeMo) as of November 8, 2016. Banks in India support contactless payments and digital banking in this contemporary DeMo age, and they are increasingly implementing fintech. There is intense competition in the financial system between individual banks and bank groups as a result of the digital take on elements place in the Indian economy as a whole and the banking industry in particular. The Next Generation of Private Banking Institutions (NGPSBs) is quickly eroding the market share held by Public Sector Banks (PSBs) (NGPBs). Using ICT-based solutions can help banks stay competitive in an environment where industry competition is on the rise. In the ongoing DeMo era in India, this study examines the implications of information mining technologies for improved competition, especially in conventional banking institutions.

**Keywords:** Public Sector Banks, ICT, Financial Technology, Demonetization, Data Mining Technique

### **Introduction**

There is indeed a gradual but obvious transition away from the current post-industrial society and towards a knowledge society as the tides of the "information revolution" spread across the world.

The rapid developments in the area of Information Technology which naturally are a result of the "electronic revolution," are a related and connected development(Dash & Bhusan, 2014). Digital rebellion and electronic revolutions are gathering forth fundamental switches in the method in which organizations are governed, economic activities are conducted and administration is completed(Goetz, 2010). This enlargement has got very important repercussions on the process and economic replica of any firm, so the situation of monetary intermediation such as financial institutions is no exemption(Elena & Silviu, 2010).

It is clear commencing the speed by which banks all across the world are adopting new technology. During the early 2000s, the Indian banking industry had been adopting the aforementioned worldwide tendency(Farooqi & Iqbal, 2016). It is important to note that Indian banks have indeed been slow to accept technological advancements. Due to the banking industry deregulation measures put in place in 1992 that made them more aggressive in financial performance and customer service, those measures were the primary driving force behind their adoption of the most recent technology(Kaddouri, 2011). The Reserve Bank of India (RBI) only gave ICT adoption a major push in 1999–2000 for two reasons. The Indian government's Demonetisation (DeMo) campaign, which began on November 8, 2016, has provided additional motivation for banks to use ICT more widely(Kumara & Ranjan, 2012).

Following the reforms implemented in the Indian banking sector in 1992, PSBs—public sector banks controlled by the government—which had previously dominated the industry and had been heavily focused on meeting social obligations—were now required to operate on a commercial basis(Miller, 2016). Even PSBs began considering profitable company structures rather than only adhering to regulatory requirements and social commitments, now similar to banks in the private sector(Mishra, 2014). When it comes to their technological foundation, business strategies, central bank regulatory controls, and performance, Old Private Sector Banks (OPBs) are often comparable to PSBs in this situation. The Reserve Bank of India (RBI) only gave ICT adoption a major push in 1999–2000 for two reasons(Mocanu, 2016). First, specifically to ensure a seamless transition into the year 2000. Second, for ensuring the overall technology advancement of banking institutions in India, primarily to simplify payments and settlements, banks should improve consumer services, and increased profitability(Munusamy et al., 2014). The Indian

government's Demonetisation (DeMo) campaign, which began on November 8, 2016, has provided additional motivation for banks to use ICT more widely. Following the reforms implemented in the Indian banking sector in 1992, PSBs—public sector banks controlled by the government—which had previously dominated the industry and had been heavily focused on meeting social obligations—were now required to operate on a commercial basis(Chaita, 2016). Even PSBs began considering profitable company structures rather than only adhering to regulatory requirements and social commitments, just like Private Sector Banks (PVBs) and International Banks (IBs). When it comes to their scientific foundation, commerce strategies, and dogmatic oversight by the central banking system, concert, or productivity, Old Private Sector Banks (OPBs) are often comparable to PSBs(Thiyagarajan & Arulraj, 2012). Since OPBs, like PSBs, are "traditional" in nature. Additionally, due to the banking sector reforms that resulted in the configuration of a New Iteration Banks in the private sector in the middle of the 90s and the additional vitality displayed by international banks operating in India, both of the aforementioned categories of banks have technologically advanced platforms(Khan, 2013), increasing the level of rivalry within the sector. As a result, the demands of "LPG" (Deregulation, Privatization, and Modernization) have principally helped to inject "economic sense" or "profit motive" in the banking industry, particularly the PSBs, in the Indian banking context(Üney-yüksektepe, 2014). However, the industry has experienced strong competition as a result of the liberalization measures, which largely affects PSBs and OPBs because they are both more "conventional" in nature and also have lower levels of ICT usage. For financial intermediaries such as banks, providing high-quality services at competitive prices has become essential to surviving competition as well as to maintaining market share and profitability in expanding global markets. Consumers have grown more discerning, making client centricity solitary of the key parameters in shaping a company's success in the banking sector.

In aforementioned setting, banks must embrace ICT advancements to be competitive as they may greatly increase operational efficiency by lowering costs and also offer higher level client service. Since their capacity to produce pertinent information beginning vast quantities of disorganised data, new ICT techniques like data mining have gained immense importance in the banking industry today. Technologies such as data mining provide the necessary aggressive edge

for any depository to endure as well as thrive in the current period of intense rivalry in the uncompleted reform era in the Indian banking industry, that is also known as the DeMo era since November 8, 2016, which is also the DeMo era. This essay explores the idea of data mining as well as the applications that could be made of it.

### **Review of Literature**

A research on the banking sector, has taken methodical explanation of the possible developments that might significantly alter the business lending setting in India over course of the next ten years (2005–2015). This study has also addressed the probable effects of ICT upon the financial sector, including its liberation models, client facility, etc. The "five important trends" dictating banking success in 2015 were forecasted by the research.

ICT Indian Industry: A SWOT Analysis, a worldwide level research by Manoj P K (2007) in, has addressed the issues, prediction, occasion, and dangers of information industry in the country and have offered recommendations intended for its sustainable augmentation. ICT is crucial for the quicker, easier, and more transparent execution of MGNREGA, according to Manoj P K's study "Information' and Communication Technologies for Practical Deployment of MGNRAGA in India: An examination." We talk about need for ICT, its advantages, ICT success stories (like MGNREGA in Rajasthan), adoption hurdles, etc. In her paper "Significance of E Banking in Rural region - Investigation" published in 2014, Neeraja James and Manoj P K examined the significance of E banking examinations with a specific focal point on a remote community. They also made recommendations for improving the accessibility of banking in remote regions.

Rural consumers are more accepting of ICT-based goods, according to "A learning with an Emphasis Co-operative Bank and Gramin Bank" in Global Journal of Economics Research. ICT adoption is necessary, but personnel skill growth and instruction are also crucial. Bank employees need to make sure that their services have a "human touch."

### **Relationship and Importance of the Study**

Research conducted at the national and international levels show the critical importance of few requirements for banks' endurance and expansion. They comprise, among other things,

"customer centricity," "innovation focus," "focus on particular market segments," "focused on technology," "improved productivity and efficiency," etc. In the Asia-Pacific region, financial services proceeds is accepted to cultivate at a compound annual growth rate of 7.8%, compared to a global average of 7.1 percent, according to a global IBM study conducted in 2015. It highlights five significant themes that will impact banking performance in 2015.

IBM adds the following: "By 2015, the financial services industry will be highly customer-focused, controlled by multinational megabanks, and densely populated with specialised financial service providers. Technology, international regulation, and fierce competition will change how banks and non-banks are structured.

Technologies will also lead to fundamental adjustments in how employees behave, resulting in a significant impact on productivity, effectiveness, and profitability".

Box I: IBM's Identification of the Five Important Themes Impacting Banking Performance in 2015.

- 1) Customers will be smart, informed and savvy users – they will only be interested in service providers that can meet their very specific individual needs.
- 2) Market consolidation will continue, making the mega banks even bigger. But, even big banks will face specialized niche competition, from nimble competitors like community banks, industry specialists and non-bank banks that specialize in providing specific services.
- 3) New workforce – Need for productivity and efficiency will create new sources labor and work practices. But there will also be intense competition to attract and retain talent.
- 4) Regulated transparency – Compliance with globally enforced standards of transparency and accountability.
- 5) Sharp focus on technology – This enables the requisite changes, and also rapid and accurate decision making, greater operational flexibility and efficiency. The successful will be those who can track and analyze specific customer needs and meet them with profitable and reliable products.

Source: IBM (2005), Banking 2015: Defining the Future of Banking, Nov. (www.ibm.com)

In its most recent outlook (2006), the global rating agency Bond rating Service said that India's banking sector is robust, supported by generally sound financial measures and it is in constructive functioning conditions, helpful to loan expansion. Strong market availability, strict prudential standards, and a higher credit hazard outline of banks by means of a lowering rank of NPA are all positive characteristics. The Indian banking sector appears to be resilient and well-

prepared to comply with the BASEL - II requirements, according to a nationwide survey undertaken by the FICCI in September 2006.

### **Purpose of the Research**

- (i) To identify the key developments and precedence in Indian banking in more competitive environment, which has been defined by the DeMo drive from November 2016;
- (ii) Researching the necessity for banks to implement IT advancements in order to compete in the new environment, specifically technologies like data mining
- (iii) Make recommendations on ways to help Indian banks compete in the current period of globalisation, which is defined by the DeMo push as well.

### **Data Mining and Its Application to Procedure of Formulating Management Decisions**

The recovery of hidden use as from sizable datasets is the basis of the newly emerging technology known as data mining. It has the ability to assist businesses concentrate on the most crucial information that they have in their own data stores. It has a few crucial characteristics. The idea of data mining progressively developed from attempts to collect business data in the 1960s, moved on to data accessibility in the 1980s, then moved on to information warehousing and decision and is now evolving towards data mining since it is currently understood. The four phases listed above from the viewpoint of the users, are evolutionary in nature since they each made it possible to rapidly and accurately respond to new common queries.

Progressive firms today, such as banking institutions, retailers, etc., utilized such technologies to sift through their massive data sets to obtain pertinent information, allowing them to create informed and good choices.

Data mining techniques can be applied in one of the following two different ways: (i) immediately on current platforms, increasing worth of existing resources of information, or (ii) as new services and goods come online, integrating them with current ones. Also, by processing huge databases, these can offer more potent information inputs if they are deployed on high - performing client-server or massively parallel computer networks. One example of such

sophisticated information inputs is responses to hypothetical queries like, "Who of my clients are most probable to reply to my next marketing mail, and why?"

### **Utilization of Data Mining Technique in Banking**

Due to its capacity to significantly improve the efficacy of client relationship management, effective handling of credit risks, scientific strategy to marketing by concentrating on particular customer segments, etc., data mining technology find widespread uses in contemporary commercial banking. Here is a brief discussion of two of the most significant data mining methods in banking:

#### **Efficient Credit Risk Evaluation and Control Using Data Mining**

Scientifically speaking, data mining technologies can greatly enhance the evaluation of credit risk quality. Data gathering technologies are incorporated into contemporary organizational learning (KM) systems, which can deliver useful inputs on the risks connected with loan requests. These KM systems employ the most recent Information Retrieval and Data Mining (KDD) tools, which are capable of extracting unknown important information from various databases and using it in the relevant application. As a result, these systems can forecast loan repayment patterns, credit risks, and other aspects, which can aid in making well-informed and rational credit decisions. Forecasting analytics and interpretive models are the two main categories of models for data mining that are frequently employed in practise. Here's a quick rundown of these two versions' features.

- **Predictive Models:** Such models have the ability to forecast the value of a specific property. Classification models and multiple regressions are two distinct categories. A regression model (regressor) forecasts a number from a broad spectrum of potential values, in contrast to a classification algorithm (classifier), which is concerned with membership in a certain class. (Descriptive models are frequently predictive models as well. Occasionally a predictive woman's explanatory component outperforms its predictive power.
- **Descriptive Models** - Although not predictive in nature, these models can help with data correlation and clustering. As a result, there are two categories of

models: association structures and clustering designs. Comparable people, things, or events are grouped together into groups in the cluster (segmentation) model, whereas affinity—or how regularly two or more items occur together—is determined in the array.

### **Banks' Competition Management Strategies in an Innovation Scenario**

A few solutions are attempted here in an effort to help Indian banks, in the new financial environment in light of the talks that have gone before. It is important to note that this technology is implicitly or explicitly connected to banks' embrace of information technology advancements, such as instruments for information mining.

1. **Technology:** Every progressive institution that wants to survive and flourish urgently needs a sophisticated technical infrastructure that can enable technologies like data mining and knowledge discovery. It should make it possible to engage customers at a high level and make it easier to target various client segments with specialised offerings. To stay competitive, quickly payment technology like RFID (Radio Frequency Identification) must be encouraged. Moreover, investments in IT must concentrate on enhancing receptiveness, cross-organizational partnership. Consolidation will make sure that technological expenditures are more worthwhile and cost-effective. Alliances and sharing resources among the institutions can result in increased technology use effectiveness.
2. **Customer-Centricity:** In the near future, customer centricity will play a crucial role in all service-based industries. Consistently implementing viable business strategies that guarantee ongoing client loyalty, i.e. long-term connections, is essential.
3. **Business model** supports ongoing innovation in products and processes. Improvement of each kind on a continual base is a fundamental prerequisite for keeping as well as attracts the marketplace because of the speed at which technical advancements occur and the increasingly discriminating nature of client expectations in today's international markets. Also, each and every item must be developed using a complete sense of the quality product offering of the consumer.
4. **Focusing on Specialized Customer Groups:** Inside the future, banks will have to concentrate on specialized client segments since more discerning consumers no longer

want services that are highly specialized and offer solutions that are precisely suited to their needs. Banks will need to do rigorous market research studies and use cutting-edge ICT technologies like data analysis in order to identify the target client categories. Most important, it's critical to develop effective comprises of nine to successfully counter the threat posed by specialized (niche) players.

5. **Improved Operational Efficiency as well as Productivity:** Increasing cost effectiveness by lowering transaction costs through the deployment of ICT seems to be the most relevant and practical technique for enhancing the effectiveness and productivity of operations.
6. **Online and mobile banking, as well as other high-tech banking products:** High technology (Hi-Tech) items and additional delivery alternatives are necessities rather than choices for the survival and development of today's highly discriminating consumers. The aforementioned method is increasingly effective due to the rising trend in computer literacy and the younger generation's increasing love for contemporary goods.
7. **Increasing Cyber Crimes and Frauds: The Necessity for Data Security:** Banks are utilizing ICT-based services and fintech (Fin Tech) at an increasing rate, and this is accompanied by an increase in scams, information/cyber security concerns, data leaks, frauds, etc. Therefore, establishing sound mechanisms for managing the risks related to knowledge security ought to be among all banks' top priorities.
8. **Human Contact (Human Factor):** Notwithstanding the extent of ICT adoption, a personal interaction is necessary for financial services to be all-encompassing and thorough. With careful planning, this human aspect must guarantee sufficient client touch points for all items.

## Conclusion

Even with problems like rising NPAs and the need for capital raising, especially for India's public sector banks (PSBs), it should be underlined that the country's financial system is still sufficiently strong, robust, and well-equipped to adhere to international regulatory standards. Despite the negative effects of the Demonetization (DeMo) push in November 2016 and the abrupt introduction of the Goods and Services Tax (GST) in July 2017, economic development

in India has been comparatively strong during the past several years. In fact, the negative effects of DeMo and GST are starting to slowly fade away on the Indian economy (Bhattacharya & Mishra, 2015). Even with problems like rising NPAs and the need for capital raising, especially for India's public sector banks (PSBs), it should be underlined that the country's financial system is still sufficiently strong, robust, and well-equipped to adhere to global regulatory standards. Despite the negative effects of the Demonetization (DeMo) push in November 2016 and the abrupt introduction of the Goods and Services Tax (GST) in July 2017, economic development in India has been comparatively strong during the past several years. In fact, the negative effects of DeMo and GST are starting to slowly fade away on the Indian economy (Bansal & Malik, 2015). It's interesting to note that industry concentration and technology advancement work synergistically to reduce costs. Moreover, the aforementioned form of merger has already started in India, especially among the PSBs. It is not necessary to overstate the importance of implementing advanced technical tools like data mining because banks will need to become more consumer in the future. In this environment, approaches for reorganizing the banking industry with a strong focus on the client and a solid technology foundation are of the greatest priority.

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