

ANALYTICS IN INDIAN BANKING: THE PATH AHEAD

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Abstract:

Indian Banking industry has undergone a series of transformations with the advent of Information Technology (IT) since 1980s, 1990s and 2000s in terms of applications of IT in different banking processes from various perspectives such as cost reduction, revenue generation, fraud detection, security issues etc. and this transformation is still continuing with new trend called Business Intelligence and Big Data Analytics. In the present banking scenario Big Data Analytics stands as the solution for the increasing competition and regulatory challenges with fraud and cyber security threats where banks are under rigorous pressure to improve the efficiency and revenue to sustain profit margins and customers. Analytics in Banking supports Decision Making to elevate revenue, control costs and mitigate risks. This in turn improves customer segment; target, create and retain customers along with customer understanding and risk management. The present paper focuses on the concepts of Analytics in Indian Banking sector. A conceptual framework has been designed and presented with the help of various literatures on business intelligence and big data analytics in banking sector stating the drivers of data analytics and what business value can be created in banks. The paper also deals with the adoption and successful implementation of Analytics in Indian Banks with few cases along with the challenges faced and its trends in Indian Banking Sector.

Key words: Big Data Analytics, Risk Management, Fraud Detection, Customer Segmentation, Governance.

ANALYTICS IN INDIAN BANKING: THE PATH AHEAD

INTRODUCTION:

The Banking Industry has witnessed a huge transformation during the last decade due to technological advancements. No other industry has shown such quick responsiveness to the changes. The advent of information systems (IT) since 1980s, 1990s and early 2000s transformed the banks in terms of application of IT in different business process from various perspectives such as cost reduction, revenue generation, fraud detection security etc. Similarly, analytics in banking is also meant for transforming such institution. According to a survey by Everest Group, Analytics has emerged as a key driver for cloud services in banking. Datamining and advanced analytics techniques helped banks to manage market uncertainty, exposure risk control and fraud minimization.

Financial metrics and KPIs provide effective measures for banks' overall performance. Banks need to move beyond standard business reporting and sales forecasting, in order to reach their strategic goals. Datamining, multivariate descriptive analytics and predictive analytics help banks to extract intelligent visions and quantifiable predictions that covers all types of customer behaviors such as account opening and closing, transactions, defaults if any and customer exit. With the continuous increase in competition, regulatory changes, fraud and cyber security threats, banks face tremendous pressure to improve operating efficiencies and grow wallet shares to sustain in the market. So analytics is found to be the solution for better operating efficiency and proper customer engagement and also in mitigating risk as well as optimizing the deployment and utilization of banks resources.

Objectives of the Study:

The objectives of the present paper are:

1. To understand the concepts of Analytics in Banking Sector
2. To design model framework with the drivers of data analytics in Banking that lead to Creation of Business Value.
3. To study the adoption of Analytics in Indian Banking and challenges faced.

Methodology of the Study:

The study is conceptual and descriptive in nature. It is based on purely secondary data collected from various literatures, reports on Analytics in Banking published by various organizations at various periods and online resources. Out of the literatures observed and studied a conceptual model / framework has been structured with drivers of Analytics in Banking.

BIG DATA ANALYTICS:

Big Data Analytics is an extremely huge and varied data sets which are handled, analyzed, managed and validated through data management tools to make informed decisions. The data sets may be unstructured, semi-structured and structured; meta data from internet; social media data; web browser history and responses to surveys; machine data from Internet of Things (IoT) etc. which are in the form of five V's such as Volume, Velocity, Variety, Veracity and Value. Analytics is an encompassing and multidimensional field which uses mathematics, statistics, predictive modeling and machine learning techniques to find the meaningful patterns and have knowledge of the data so recorded.

Banking Industry comprises of enormous transactional data that is required to be properly managed, scrutinized, evaluated and utilized for the benefit of the banks and its customers.

Evolution of Big Data Analytics:

The human civilization started to organize, interpret and summarize data for finding the values. Similarly, data has been collected and used to interpret results for better decision making in various roles. In early 20th century, the Statistician, Gosset, applied his statistical knowledge in brewery and farm related aspects for selecting the best yield varieties of barley. That was the first statistical modeling; later several software tools such as Excel, SAS and programming languages like R and Python came into existence supporting the practitioners of multiple fields. OLAP (Online Analytical Processing) was first used during 1997s for multidimensional analysis and then Business Intelligence analysis was done for data driven decisions and reporting tools during 2000s. Analytics in the form of Statistical and Mathematical Analysis was then followed with SAS implementation during 2010 and finally now as Big Data Analytics several such programs were being followed through the support of various programming languages and software tools innovated and structured for the present data sets.



Source: www.digitalvidya.com

Figure 1: Analytics Evolution Roles and Technologies

ANALYTICS IN BANKING:

Due to technological advancement there is no much interaction of customers and bankers at least to ensure that the current customer is well satisfied with their services so as to retain them. For banks customer acquisition is more costly than retaining old ones. Customer may be requiring varied services such as discounts on purchases, convenience, simplified home buying, personalized services, information and alerts etc. The traditional tools are not sufficient to process the data for all types of decision making. Hence, banks are using data analytics in an efficient manner so as to enhance their customer value with better and faster decisions and also to maximize their revenue.

BENEFITS:

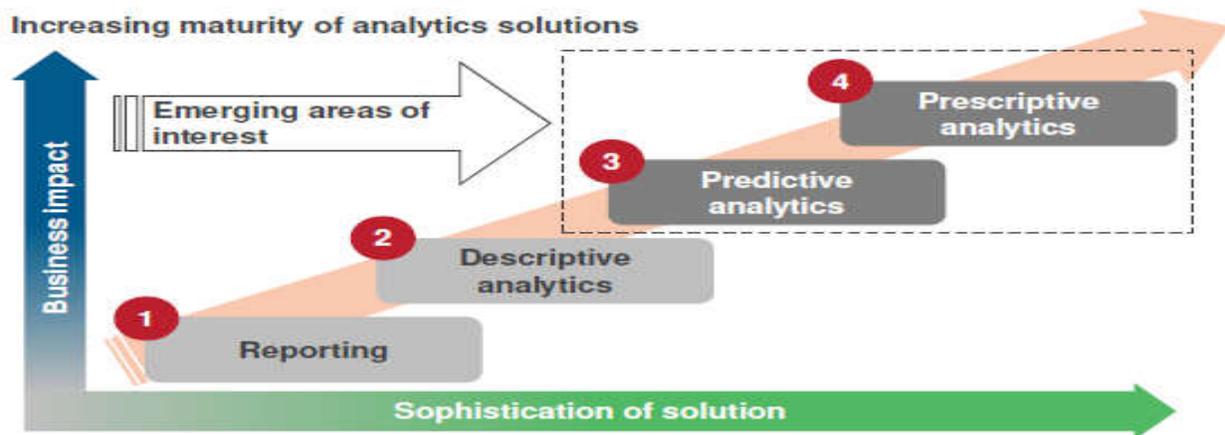
There are several benefits of Analytics in Banking, like,

- a. Better understanding of customer behaviour and responding to changes in preferences faster.
- b. Meeting regulatory requirements and addressing the setbacks on real time basis
- c. Improved product design and overall product portfolio optimization
- d. Increase transparency
- e. Develop a risk adjusted view of performance
- f. Manage fraud effectively
- g. Measure customer and product profitability
- h. Identify high potential prospects and customers
- i. Improve the ability to target products and services to prospective customers
- j. Enhance specific elements of the offer like product pricing, channeling etc.

STAGES OF BANKING ANALYTICS:

The basic aim of Banks is to acquire customers, retain and finally develop them. For this they go with the sentiment analysis, 360 degree customer analysis along with customer segmentation, best offers for them product management and design targeted marketed programs to reach them. These activities are supported by data analytics. This involves a series of stages of maintaining data and processing them to reach the informed decisions of the bankers at regular intervals.

The models of analytics differ from simple reporting to highly sophisticated prescriptive analytics solution and is in proportion to increasing business value / impact.



Source: *Analytics in Banking – Everest Group Research.*

Figure 2: Stages of Banking Analytics

1. **Reporting:** This involves building data warehouse and report the current situation. Here only raw information is gathered which is both structured and unstructured and which is collected from various sources. For example it may be a suspicious activity reporting and account validations against watch lists.
2. **Descriptive Analytics:** This is an actionable insight on the current position. Complex and time series data is considered for applying basic set of statistical and mathematical tools to study the data behaviour and draw minor conclusions. For example customer segmentation and profitability, campaign analytics, value at risk calculations etc.
3. **Predictive Analytics:** This analytics predicts the likely future outcomes of the events. Here the big data is considered being real time and from various sources known and unknown. Accordingly, advanced and specialized tools are considered for predicting the

future possibilities. Pattern recognition and machine learning to predict fraud, risk alerts generation at various levels, designing personalized and next best offers etc.

4. **Prescriptive Analytics:** This analytics prescribes the action on the predicted outcomes for a situation. Still more advanced techniques are used for prescriptive actions on the predicted outcomes and it promotes self learning. For example behavioral probability defaults, loss given defaults, exposure at default modeling, stress testing for mandated and custom scenarios etc.

ANALYTICS IN BANKING – MODEL FRAMEWORK:

The key areas where analytics in Banking impacted a lot are:

1. Consumer and Marketing Analytics
2. Risk, fraud and Anti-Money Laundering / Know Your Customer Analytics
3. Product and Portfolio optimization modeling.

Accordingly, a frame work model can be designed with basic drivers / components of banking data analytics being –

1. Operations and Performance Management
2. Customer Management
3. Risk Management
4. Regulatory Governance and Compliance
5. Fraud Management

The analytics of all these scenarios in banking gives a business value in the form of better customer service and thereby satisfied and loyal customers, profitability, good governance, risk minimization, customized retail products to customers to enhance the business operations and its value. The model framework can be depicted as follows:

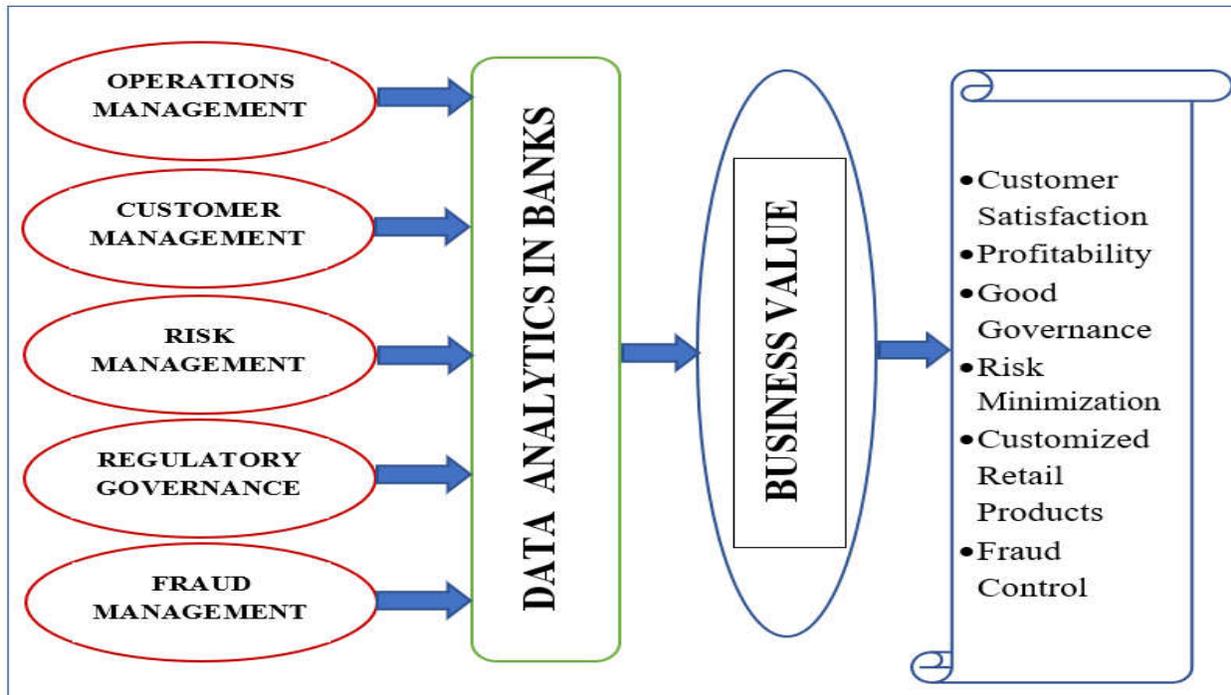


Figure 3: Model Framework of Analytics in Banking

1. Operations and Performance Management:

Operations management is one such driver which involves a series of analytics that can be considered such as supply chain analytics, claims analytics, call centre analytics, work force analytics, IT operations, spend and usage behaviour analytics. All these focus on product and portfolio optimization that determines prepayments, misbehaviors defaults and cash flows to the banks. It can adjust various ratios according to regulations for meeting capital requirements i.e., Basel norms. This analytics shows better impact on profitability of the banks thereby helps in smooth flow of operations.

2. Customer Management:

Customer management is one of the most important activities of the banks as dissatisfied customer may prove to be fatal to the organization and moreover customer retention is less costly than customer acquisition. Under customer management of banks we come across market sizing, segmentation and targeting, customer acquisition strategy, cross sell and up-sell opportunities, marketing mix and optimization leading to channel performance, campaign and sales effectiveness, customer satisfaction from customer lifetime value (CLV) estimation, digital experience of customers product comparison and attributed sentiment and tracking sentiments in future, brand equity and trends information from social media and

digital media and finally real time offers and personalization. All these are analyzed and there by possible decisions are taken to retain customers and improve their satisfaction.

3. Risk Management:

Risk management analytics modeling involves analysis of various portfolios to forecast likely losses and make provisions for those adequately. It comprises of risk assessment, scoring and rules, credit risk, AML, KYC, loss forecasting, default management, collections analytics, regulatory requirements in relation to Basel and CCAR, trade cancels and settlements etc. all these are properly analyzed helping in increasing profitability and reducing payouts and legal hassles. Early warning signals of both customers and banks are sent in case of any mis-happenings or finding such preventive actions for protecting from AML incidents.

4. Regulatory Governance and Compliance:

Due to stringent regulatory environment there is rising cost of compliance and also risk of non-compliance in some cases. Under regulatory and governance compliance analytics proper regulations are followed by the banks and there is a check if any deviation is there in the operations or any issues relating to the customer activities thereby protecting the governance of the banks. This ensures trust on the banks from the customers.

5. Fraud Management:

Proactive fraud detection is necessary for the banks to secure customers and employees. Fraud Analytics comprises of detecting, preventing and mitigating fraud risk in real time, application and transactional fraud monitoring, real time monitoring of rules and AML solutions. This ensures early warning signals to the banks whenever any deviations in the activities are found to be aroused.

IMPLEMENTATION OF ANLYTICS IN BANKING:

Analytics in Banking can be implemented in the four stages that are discussed. The process of implementing data analytics in banks requires understanding of various aspects of banking and technology to bring out a successful system. For this:

1. Prioritize the focus areas:

Banks should identify the areas (i.e., customer, risk, finance, governance or fraud) where data and analytics can show greatest impact and obtain leadership engagement from the start.

2. Streamlining of data:

This requires integration of high quality of data with the data in the silos across products and lines of business. For example a single view of customer, his transactions, tastes and preferences, aggregated risk exposure by product etc.

3. Integration with decision management system:

Analytics is itself meant for taking real time smart decisions. Thus, proper integration with decision management systems is necessary.

4. Talent hunt:

Finding the right talent (i.e., statistical modelling professionals, big data analysts etc.) for right process ensures the success of that activity. Banks should have a talent plan that builds on both existing internal talent and external sources.

5. Make connections:

Banks which have already had certain facets of analytics should chalk out a smart plan for connecting the teams across the whole organization which in turn strengthens the existing one or comes out with a more effective ones.

CHALLENGES FACED BY BANKS:

With the facets of varied data, software tools and programs to be adopted, outcomes to be analyzed and decision to be made on real time banks lack internal capabilities and capacities.

1. Cost and Time: Banks budget may not be sufficient to meet the high planning of analytics implementation. Similarly, the time available to integrate the present process to analytics is more and if done they may be risking the competitive advantage in delays.

2. Expertise of Analytics: Banks may not have expertise staff in analytics or even the understandability of such areas is very less which ultimately hinder the implementation process. Just hiring statisticians with advanced degree is not enough, it requires professionals with business contact, data management, technology understanding and knowledge of existing and emerging regulations.

3. **Technology Resources:** Understanding of analytics tools and their integration to the present process flow is limited in banks due to lack of expertise and also resources.
4. **Benchmarking Data:** bench marks and efficiency indicators help a lot in comparing internal performance, but the in analytics it is difficult to set the quantifiable targets due to lack of historical information.
5. **Process Expertise:** It is necessary to connect the analytics to operational performance objectives and this can be done through a third party service provider (as an outsourcing engagement) thereby driving analytics objectives towards process performance.

SUCCESSFUL IMPLEMENTATION OF BANKING ANALYTICS:

For successful implementation of analytics in banks there are three most important things to be considered. They are:

1. Data coverage and Relevance: -

- a. It is very important to validate the source and completeness of data as such incomplete and broken data may result in wrong observations.
- b. Proper feedback loops are to be considered for effective implementation as implementation is a continuous process.

2. Suitability of Technology: -

- a. Selection of technology should be based on capability, cost and future needs.
- b. Turnkey technology solutions should be evaluated basing on the ability to integrate with the banks process.

3. Governance Structures: -

- a. Right governance structures are to be adopted after clear relevancy to functions.
- b. Governance team should also measure ROI and should assess the changes to organizational, operational model of the banks.

Banking analytics can be successfully implemented by either pure-play analytic service providers such as Absolute data, Crisil, Fractal etc. who support only analytics services; and IT/BPO service providers who engage themselves both in analytics as well as BPO services such as Accenture, Cognizant, IBM, Genpact, hp, Infosys, TCS, WNS etc.

ANLYTICS IN INDIAN BANKING SCENARIO:

Analytics in Indian Banking is still at its nascent stage and so the value creation potential is also very low. The market size of Finance and Banking sector in Analytics is growing at a faster pace than any other sector as it was \$575 MN, \$756MN and \$1030MN during 2016, 2017 and 2018 respectively. Delhi and Bangalore are showing increasing growth rate with respect to market size. Let us see trend of analytics in Indian Banking system through a few cases.

HDFC Bank – Customer Analytics:

In early 2000s HDFC Bank Ltd. started investing in technology for large volumes of unstructured data captured by its information technology (IT) systems. During 2004 to 2006 basic analytics in terms of an enterprise data warehouse was employed. With this, HDFC Bank can track every aspect of a typical customer's financial habits.

The analytics tools also gives an understanding of personal habits of its customers to promote offers. Analytics is also used to reduce chances of money laundering by identifying suspicious activity like moving money to multiple accounts, single-day cash deposits in large volumes, opening a number of accounts in a short period or sudden activity in long-dormant accounts. It also kept track of credit histories of customers and can hand out loans accordingly.

HDFC Bank has ambitious plans to achieve new acumens and so it included analytics in its future strategic decisions, including geographic expansion, channel efficiency measurement and resource allocation.

ICICI Bank – Credit Risk

The subprime mortgage crisis during 2007 in US had repercussions in India also. Banks were struggling with challenges of reduced liquidity and rising interest rates and still ensure that their customers remained happy and loyal.

Debt Collection is identified as the key process to improve customer satisfaction. For this right customer-approach channel is required which is served by the analytics with an aim to transform debt collection as a customer retention tool. An in-house BI solution was implemented by the bank which includes SAS, Sybase, TRIAD, Posidex, Data Clean, and Blaze Advisor to check efficiency of collector, customer profile, risk behavior and exposure.

The bank employed a 'centralized debtors allocation model' to allocate the right set of delinquent cases to the most appropriate collection channel. The bank uses multiple channels for debt collection. This includes SMS, e-mails, IVR, dunning letters, and reminder calls through the

call centers, which are used to handle early misbehaviors. The serious delinquents require a personal visit or may even need initiation of legal action. This use of analytics has brought a number of efficiencies in the process such as reducing manpower needs by 80%.

Axis Bank – Customer Intelligence and Risk Management:

Axis Bank uses analytics to check customer background, to increase customer loyalty and reduce loan prepayments due to refinancing with other institutions. Bank uses SAS to provide customer intelligence across the organization to improve risk management by giving early warning signals.

ING Vysya Bank – Advanced Analytics (Data Modelling and Neural Network Scoring Engine):

ING Vysya (now acquired by Kotak Mahindra Bank) felt the need for business intelligence (BI) implementation when the bank started noticing how different end users attended meetings with inaccurate reports. They created a common data repository with the help of SAP BO, which helped users get accurate reports and in turn improve efficiency.

Now the bank uses analytics to follow the AML (Anti Money Laundering) guidelines around fraud analysis, through a tool of advanced analytics of a neural network scoring engine with a customized scoring model. It compares the characteristics of a customer's financial activity with the custom-model and records the patterns of behavior for each account holder. It then assigns a score reflecting the degree of risk for each transaction. It also has a learning mechanism that learns or records genuine behaviors.

State Bank of India – Social Media Analytics:

Public sector banks are not far behind in using analytics. SBI's data warehouse has over 120 TB of data and receives an additional 4 TB of banking data a day. The bank has hired about 16 statisticians and economists over the past few months and has plans to build about 60 models. These data models are applied to education loans, automotive loans, housing loans, SME loans to try and reduce the bad debts percentage. Analytics is also been used to determine where ATM branches should be situated and how much cash should be placed in them.

IDBI Bank –

The bank joined with Oracle Financial Services to develop an analytics solution for assessing interest and liquidity risk and also to improve performance analysis.

Similarly, Kotak Mahindra Bank uses analytics for CRM infrastructures, Nevertheless, Indian banks are still far behind in data analytics usage when compared to their western countries', yet they are on the right track.

CONCLUSION:

Banks should transform massive volumes of organizational data into actionable insights and strategies. Business Analytics or Big Data Analytics provides comprehensive capabilities to help banks to perform customer profitability analytics, manage risk and improve operational efficiency. Sophisticated predictive and prescriptive analytics improves banks' profitability, compliance, sustainability and competitiveness. However, implementing this analytics is a challenging aspect looking at the basic realities such as functional silos, talent crunch and technological resources or infrastructure. But there is no other way out for the banking industry that can create value than the tool Analytics.

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