Business Intelligence for Reducing NPA in Indian Banking Sector

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Abstract

Indian Banking sector is a blend of Private as well as public sector banks. In the Economy of a Nation, banks keep a deposit with themselves and interest the depositors. The banks are responsible for the majority of the lending operations that took place in the economy. However, since 2008, the returns on Indian banks’ assets are continuously falling. A healthy banking system is the backbone of a healthy economy. Hence, to help banks make wiser decisions about creating fruitful assets in the future, the paper advises Business Intelligence to help decision-makers make sound decisions and ultimately prevent productive assets in the future. This paper is an attempt to use the Business Intelligence tools to predict if the loan application will turn stressed or not. The outcome of this paper will be on suggesting parameters for the Indian Banks to judge an asset-to-be about its fruitfulness so that the NPAs of these banks will be reduced in the future.

Keywords

Business Intelligence, NPA, Indian Banking Sector, economy, RBI

Imprint


1. Introduction

In the Economy of a Nation, banks keep a deposit with themselves and interest the depositors. To pay the interest, salaries to staff and make profits for banks’ future development, they use the depositor’s money to generate revenues. They either invest the money in the sources with fetching them a higher rate of returns for revenues [1]. Lending the money to borrowers at a higher interest rate is one of the ways. The difference between the depositor’s interest rates and the borrower’s interest rate is the bank’s income. Hence, the borrowers are an ASSET to the banks. The banks generate revenue from these assets, which is a very general and crude language. The process is much more complex, and many rules and regulations play a major role in the process. However, that is not the topic of the paper [2].

Now, that is the ideal case. All borrowers return the money on a pre-determined time and with interest and let us bank make money. Every borrower comes with a risk. A risk of not being able to return the money in the future [3]. When the borrowers are repaying their loans at the pre-decided installments, it is the Performing Asset of the Bank. However, when the entity stops paying the banks towards his borrowings, it becomes Non-Performing Asset (NPA) for the bank. In India, before lockdown, if an entity fails to pay for its borrowing for 90 days, it becomes a Non-Performing Asset for the bank. The NPAs are further classified as per their types [4].

Now, let us understand the vicious cycle. The banks generate their revenue from their Assets. If the assets are non-performing, their revenue reduces. More non-performing assets, the lesser revenue for the banks. Hence, banks will start investing more in less risk-bearing sources, such as Government securities, which ensures them limited earnings [5]. They will also reduce the interest rate for depositors, leading the depositors to move their money out of the banks. Now, as the bank’s assets are not performing, they cannot pay more to the borrowers coming for borrowings. In short, they cannot generate more assets for themselves as they do not have the resources to generate the assets [6]. As the borrowers do not have lenders, they cannot start or expand their business, which might have generated more employment, which might have given more money in the hands of people which they might deposit in the banks, giving them resources to lend further, which is a very general picture of how the banks and borrowers complement each other for each other’s development [7].
The NPAs are on the rise since 2008 and increasing every year as shown in Figure 1, which leads to degrading the quality of the Assets the banks have with them; the following chart gives a clear relationship between the Gross NPAs and the Return on Assets for Banks as shown in Figure 2.

![Figure 1: Gross NPAs (% of total loans)
Source: Reserve Bank of India$ PRS](image1)

![Figure 2: Return on Assets (%)
Source: Reserve Bank of India$ PRS](image2)

However, when the cycle is broken, it affects the entire country at large. The banks have Non Performing Assets, which leads to restrictions on their lending abilities, which prevents business developments, which leads to unemployment, which leads to reduced resources for banks, which even prevents their ability to asset creation, and this vicious cycle goes on [8]. As of March 31, 2018, provisional estimates suggest that the total volume of gross NPAs in the economy stands at 10.35 lakh crore, which accounts for 9.3% of the total lending lent by the Indian Banking Sector [9].

The major reason for these NPAs is the evergreening of stressed assets. The easy availability of loans made companies and businesses take loans in the mid-2000s. Due to the 2008 crisis, the loans became stressed, and companies could not repay the loans, which gave rise to Twin Balance Sheet Problem and the chain of NPAs started [10]. A report by RBI in December 2019 says the share of large borrowers in banks’ total loan portfolios and their share in GNPAs was at 51.8 percent and 79.3 percent, respectively, in September 2019 [11]. That implies that 79.3 percent of defaults are from large loans.

Now, let us come to the other keyword of the paper, Business intelligence. Business intelligence (BI) may be defined as a set of mathematical models and analysis methodologies that exploit the available data to generate information and knowledge useful for complex decision-making processes [12]. So, we can say that BI is a set of instructions or models that help us in decision-making by using the available data. So, in the case of NPAs, the banks can use mathematical models for a loan proposal to help them predict if the loan will be defaulted or not. In that way, the lending will be done in a more structured and disciplined manner. They will be backed by a scientific methodology that will help prevent and reduce defaults in the future.

In this paper, I would like to discuss the parameters that can provide an effective model to accurately predict the lending proposal and help the banks to reduce their NPAs in the future.

2. Objectives

To suggest a BI-based model, rate the lending proposal based on its future performance.

3. Literature Review

The paper study is the Impact of Business intelligence (BI) on six commercial banks, which represents 60% of assets of commercial banks in Poland. To study the impact author uses 14 indicators divided across six categories, viz. liquidity, quality of assets and liabilities, debt, productivity, profitability, and capital adequacy. The author finds the impact of BI was found across all the sectors and denotes the banks’ improved financial condition across all the parameters. The author mentions the special productivity improvement in productivity, quality of assets and liabilities, profitability, and debt [13].

The author suggests using Artificial Intelligence in money transfers, money repositories, fraud detection, Chatbots (humanoid robots in place of man, per-
forming the various banking transactions), etc., can be adapted to have better efficiency in the banking sector. The author further finds out that Artificial intelligence would make banks a more secure place and improve customer services. The author, through this study, focuses on the impact of artificial intelligence in the banking sector concerning its effectiveness and usage and the areas where artificial intelligence is applicable in the banking sector [14].

The author claims that the highly qualified personnel need to engage in extracting the full potential of BI solutions and being the bridge that connects domain and expert analytical knowledge. The HiPPO (Highest Paid Personnel in the Organization) should make decisions based on data and intelligence. The data-driven decision-making will help HiPPO to make better, faster, and quicker decisions. The paper discusses in detail the theory of BI and its usefulness to HiPPO in data-driven decision-making. While concluding, the author says the BI analysts should be close to the HiPPO for three reasons. First, BI experts have to learn the specificities, stiles, and decision-makers requirements in the decision-making process. Second, C-levels has to secure and insists on implementing BI culture throughout the organization, have a constant flow of structured data, strive towards “one truth” if possible, and use BI products for strategic, tactical, and operational decisions. Third, the only symbiosis of the decision-maker, as a user, and BI experts, as a producer of data insight, can produce a positive synergetic effect, improving decision-making quality and, consequently, improving the organization’s competitive position at the market [15]. The author suggests the use of BI in banking will be useful for Customer Relationship Management. The author suggests the Business Intelligence for better organization of the clients and getting more business to achieve better client management, which will result in better service providing to clients and increasing business with them. The paper mentions the future scope in this side by exploring other arms and areas of banking.

4. Scope of Work

• The paper aims to target the banks’ decision-maker entities about lending a loan to the business entity. This paper excludes the loans that are lent against 80% or more collateral, such as vehicles, homes, etc. This paper also excludes credit card transactions.

• The paper also excludes its scope to the loans given as per government order and is backed by the government, i.e., if defaulted, they will be repaid by the government. The loans given to certain sections of society and businesses of categories such as MSME (Micro Small and Medium Enterprises) are the ones that are backed by the government and ordered for better financial inclusion.

• The paper also excludes the lending that is part of the fiscal stimulus package that government gives to a particular section of society through the banks. Since the government guarantee backs them, the paper does not consider them.

• The paper mainly targets the businesses that seek lending for larger amounts. Large amounts are defined as the loan where exposure is more than 10 Crore INR.

• The paper targets the decision-makers to make the decisions about lending such loans. The decisions should not be just based on the company’s projects and financial history but also on the other factors that will lead to sound decision-making that will benefit the bank to prevent the particular loan from turning into a Non-Performing Asset.

• The paper suggests some fundamental changes to the existing infrastructure. The factors currently not considered or not operational are to be incorporated to prevent the NPAs.

5. Research Methodology

The current market scenario and history of NPA in the Indian Banking Sector are published by India’s Reserve bank periodically. The paper uses the statistics published by the Reserve Bank of India to analyze NPAs current situation in the Indian Banking Sector. The paper assumes that the Risk Appetite for every bank is different. Every bank has unique financial conditions and progress. The banks have their preferences for lending operations and believe that every bank has its unique business model. Every bank’s size is different in terms of network, reach the target audience, financial structure, etc. Hence, exposure requirements and exposure tolerance are different for each bank. The paper assumes that the Risk and NPA are interlinked and are directly proportioned with each other. The paper analyses the composition of NPAs in the banking sector and what constitutes most of the share. The paper limits its scope to the only factors that contribute the concentrated contribution towards the NPAs in the banking sector.
The paper identifies the following parameters as Touchpoints responsible for NPA:
1. Ever-greening of NPA in the will of they becoming performing
2. Lending with high exposure towards companies
3. Failure in rectifying fraudulent companies/directors/ Board members from the record
4. Over-ambitious Risk Appetite
5. Non-distributed lending with a focus on a particular sector or entity
6. Unsecured lending on the guidelines of the government.
7. Priority Sector Lending to comply with government norms
8. The financial damage caused due to non-financial calamities

Out of the above point, the paper intends to address the only touchpoint from 1 to 5. Therefore, to address them, the paper intends to integrate the following databases:
- Database of MCA 21 owned and operated under Ministry of Corporate Affairs, Govt. of India.
- Database of Director Identification Number, Issued and Maintained under MCA
- Database of Unique Identification Authority of India, UIDAI, operated under Ministry of Electronics and Information Technology.
- Database of Permanent Account Number, Maintained by Indian Income Tax Department, under Central Board for Direct Taxes
- CMIE ProwessIQ Financial Database
- Credit Ratings by the Govt Approved Credit rating agencies like CRISIL.

The paper tries to integrate all of them via the integration of required data warehouses to produce a consolidated and analytical output, which will help decision-makers make a well-informed decision. The data warehouse is to work at the backend to gather data from the respective data points and work accordingly to give visual output. The concept can be related to MicroStrategy Desktop, A Business intelligence software that is compatible with vast databases including SQL and NoSQL Databases to integrate, analyze and help the user visualize the data as per the requirement. The BI tool is supposed to integrate, process, and use the necessary statistical tools like regression analysis to process the Advances (Lending) proposal at banks and help the decision-makers decide to create the asset. The research also works on the assumption that lending is a Risk-Based activity. Every bank has its risk appetite. Hence, while lending, a decision-maker should be well aware of the possible risks associated with the lending proposal, which will further make banks demand additional security to reduce the bank’s risk.

6. Components of Business Intelligence Engine

Loan Application: The loan application is a bunch of necessary documents from the company and its owners. Every bank has a set format for them, and the banks can have it as per the requirement. Most of the loan applications are paper-based. The banks should move their loan application procedure to online for all types of loans. The loan application mentions the total amount of loan required, that it will be secured or not if yes, how much will be secured (in terms of percentage) and the security provided against the loan. Many banks have their various loans moved to the online format, but not all loan application formats are made online. The online-based format will help better BI compatibility. Project Report: The project report should be submitted along with the Loan application. The project report should mention the project’s details, including all the factual details, the total investment needed, the amount of loan to be taken for, and where the loan amount will be used. The report should also mention all the necessary financial ratios, including Capital structure ratio, Credit Analysis Ratio, Activity ratio, Profitability ratio, and Bankruptcy ratio. The project report should be thoroughly reviewed and attested by the chartered accountant recognized by the bank. The chartered accountant should also express his opinion about the project if any.

Linking Directors Identification Number (DIN) to Permanent Account Number (PAN) and Aadhar: the Ministry of Corporate Affairs assigns DIN to the independent directors. The Indian Income-tax department of India provides the PAN. Unique Identification Department of India provides the Aadhar. Aadhar being proof of biometric identity, and PAN being the proof of Taxation and taxation-related department; they should be linked with the DIN. This linkage will be used to fetch the directors’ financial and biometric-related history and his history of the company to which the director(s) worked earlier, providing a better perspective on the loan proposal. The directors can be directors of more than one company. Hence, to prevent the conflict of interest, this linkage is important.
Outstanding Loan: The central database that will serve the purpose of maintaining credit record of every DIN + PAN + Aadhar must be created and maintained by the central government authority to help banks for quick analysis of credit history, which will also prevent forgery or opportunity to hide the credits taken in the past and their utilization. BI tool will take input from this database to know the companies’ credit history directors associated with it. Since the database is also supposed to cover outstanding individual debts, this will also help the banking decision-makers to check if any conflict of interest exists in the proposal.

CMIE ProwessIQ linkage: The CMIE prowess’ database should take inputs from the project report entries to calculate the financial ratios like Capital structure ratio, Credit Analysis Ratio, Activity ratio, Profitability ratio, and Bankruptcy ratio. These ratios to be calculated from the past performance of the companies. Suppose the company is new and has no credit history. In that case, the ratios should be based on the project report submitted by the company. The ratios should be visible on the dashboard of the BI tool, along with other factors.

Credit Rating Agencies: The government-approved credit rating agencies should also give inputs regarding outstanding debts against the company and/or the individual present in the company’s directors/entity seeking the loan, which will further help the decision-makers to get information about if any conflict of interest exists, which will help the banks to see if the party has defaulted any loans in the past. The diagrammatical representation can be seen as in Figure 3.

The BI engine will check the applicant’s history and previous performance; Aadhar PAN DIN linkage will remove the hidden history or prevent the duplication of data, and the input can rate the applicant based on the company history and credit rating. CMIE database will help get crucial inputs from the database about the company’s performance in the past and their decision regarding the profits, reserves, credits, dividend, etc. MCA database will tell linkages of Directors and promoters of the company and their similar positions in other companies, which will keep a check on the conflict of interest, if any, pertains in the company.

The BI tool is to be designed to give an output in scale, say on a scale of 1 to 10. The scale will reflect the risk of lending the loan against the application considering all the factors declared by the applicant. Based on this scale, the decision-makers can put the terms to reduce the risk associated with the application. Since every bank has a different risk appetite, the decision-making authority will be left with the banks’ decision-makers. Along with the above parameters, the BI engine should also put a warning if a particular client breaches the lending limits that are binding on the bank. Currently, a bank has to follow an exposure limit of 20% for a single entity and 25%, in the case of a group of companies of the bank’s available eligible capital base at all times.

Figure 3. Representative Image for BI tool.
7. Word of Caution

The Aadhar PIN DIN database should be log-based only. It should only give a response in terms of required linkages only. No other personal data, like, biometrics, is to be fetched for the same purpose. The BI, in no terms, tries to breach the applicant's privacy or personnel related to the application. The bank authorities should only use the BI tool results and that only for banking purposes. Personal use of the BI tool is strictly not encouraged. The BI tool outputs should be kept secret and shared only with the applicant and personnel related to it. In no terms, Banks will be authorized to make the output public.

The BI platform logs should be thoroughly maintained for the checks and balances purpose, which will help prevent the personal use of the platform for personal interest or otherwise.

8. Conclusion

The data inputs required for the proposed data warehouse are taken from respective databases operated under the respective entities. The inputs are to take the specific data points from the databases for their analysis. The data from the Data warehouse proposed to be on a cloud-based platform will provide easy access and availability. The cloud-based platform also assures the security and availability aspect of the data. The Proposed BI engine works on the matrix of touchpoints and data points to process and analyze the data and come out with the proposed Risk Assessment in the form of scale to give risk perception associated with the particular proposal. The Risk Assessment also reflects the potential of the proposed asset-to-be to become non-performing shortly. The output is limited to the Risk Assessment. It gives requirements that need to fulfill the gaps needed to make the proposal viable and acceptable for the particular bank. By giving an expansive view from the financial condition in the past to the predicted financial condition in the future, the business intelligence tool will make the banks see the wider picture about the proposal. The Business Intelligence tool will be a tool to see as a Decision Support System for the officials to make data-driven decisions.

Business Intelligence will not pose any threat to a person or institution's privacy. The data registered with the respective authorities stand under their control only. The newly proposed BI does not intend to change, influence, or alter any original and static data recorded with the respective authority. The BI tool should be made in detail my deciding and marking weightage to every parameter. There is scope to search for any further parameters to help in more reliable risk analysis and its output. Future work can also be done for the Machine learning and artificial intelligence linkages to advise decision-makers based on the data fetched.

References

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