

# **A Study on the Management of Non-Performing Assets in the Banking Sector using Artificial Intelligence**

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## **ABSTRACT**

*India has an efficient system of banking from time immemorial. Banking acts as a pillar for regulating and monitoring of our financial activities and leads to financial growth of our country.*

*Indian banks favor the growth of our economy through growth, asset quality and profitability. Banker's Bank and government made numerous changes in the banking regulations and policies to enhance the strength of the banking sector. Some of the changes such as strengthening the prudential norms, enhancing disbursement of cash, inculcating various regulations of banks were introduced in our country.*

*Asset management of banking industry went through numerous regulations and interventions due to the deteriorations happening in the areas of asset quality and capital enhancement. In the present scenario asset classification is not being properly done and the classification of bad –loan were delaying by various banks. Earlier years Non Performing Assets were managed and controlled using the Basils Norms.*

*Technological advancement improved the transparency of assessing the credibility of customers before offering loans to them. The best indicator of the health of our banking industry is its level of Non - Performing Assets (NPA).In a broader aspect NPA will reflect the performance of the banking industry and growth of our economy. When there is reduced level of NPAs generally it will provides a view with regards to the banks that the banks have creditworthiness over the years and when there is increase in level of NPAs it depicts the importance of more provisions which will always decreases the entire profitability of the banks. Commercial banks in India faced severe problems where the political impact is more.*

*The Improved efficiency and profitability of banking sector will reduces the quantity of NPA's in India. From this study it is evident that proper understanding of various terms of NPAs and its cause and effects can easily be examine the growth of NPA's. It also focuses on managing NPA's in the Indian schedule commercial banks using artificial intelligence so it will enable to control the growth of NPA's in India.*

*Keywords: NPA, Artificial Intelligence, Schedule commercial bank, Priority sector Lending*

## **INTRODUCTION**

The banking sector's asset management is undergoing tremendous regulatory interventions in the area of worsening asset quality. In the modern world NPAs is a big challenge to banks .Technology is developing rapidly banking sector also developed along with this technological innovations.

We made banking faster through e-banking services. We can avail the banking services in our finger tips. Now in this 2019 we have much better advancement in Indian banking industry.it includes artificial intelligence and robotic banking. There are two major functions includes in banking in the world and so in India, first is depositing and next is lending.

In the first part Indian banking sector focusing for more advancement and changes but in the second part they are taking only less initiative to inculcate upcoming trends and facilitating smooth transactions. In the depositing function almost everything is computerized and transactions are recording using computer systems but still in the lending part are behind with all paper works, traditional methods were adopted and everything is different for different banks and different customers.

For the small amount of loans to the customer banks offers instant loan using the help of technologies. This small amount is granted to the customers based on their credit score and past dealings of the customers

using CIBIL track record. Whenever banks are offering instant loans to the customers they will check the banking transactions and banking history of the customers.

The total NPA's of SCB's is reported by RBI amounts to 10.25 lakhs crores. This study tries to investigate problems of NPA's in India and tries to trace out how artificial intelligence can be used as a tool in the management of NPA's.

## STATEMENT OF THE PROBLEM

According to the RBI results the banks which are under the control of various state governments, Punjab National Bank ranked first in bank fraud cases by granting loans for the past five financial years. In the recent years NPA's are increasing rapidly.

There are many new initiatives, steps and measures were taken by the banking sector to minimize the NPA's through various provisioning techniques, the S4A mechanism, SDR, DRTs and ARCs but still the condition is worsening. In this digitalized era technologies are disrupting and repositioning the life of all the customers and bankers.

Currently banks are using Artificial Intelligence (AI) for reducing banking sector frauds and NPA's. AI is not new to India various research institutions and universities have been using this for decades. This led to the advancement in the social revolution. State Bank of India, the largest bank in India initiated "Code for Bank" in order to encourage futuristic technologies such as AI and Block chain in to the banking sector. Private Banks like HDFC and ICICI banks have already introduced chat-bot for customer service.

In the last year canara bank installed Mitra and Candi robots at some of its branches. This shows that banks even started to introduce robots to perform or monitor the banking functions. In this scenario, present study is focuses on the major uses of AI in the management of NPA's in Indian Banking sector.

## OBJECTIVES OF THE STUDY

1. To examine the problems faced by the NPA's in the Indian Banking System
2. To study the influence of artificial intelligence in the management of NPA's
3. To study the influence of technological advancements in the reduction of cost in the banks along with reducing NPA's

## METHODOLOGY OF THE STUDY

The study aims to assess the role of artificial intelligence in the management of NPA's. Objective is to check the connection between NPA's and artificial intelligence. The causal relationship as well as the trend between the variables will be examined. This study is based on secondary data.

### Banks Selected

Private sector banks and Public Sector banks

## DATA COLLECTION

**Method of Data collection:** Conceptual study using Secondary Data

**Sources of data collection:** Articles, Journals, magazines and web pages

## Theoretical Background

**Non-Performing Assets(NPA):** According to Reserve Bank of India ,Non –performing assets indicate the assets which stops generating income to the bank.NPA has been classified by the financial institutions as standard assets,sub-standard,loss or doubtful asset, with reference to the guidelines relating to the asset classification. NPA impacts directly on the liquidity, profitability and the overall quality of banking assets.

**Classification of NPA’s**

**Standard assets:**Standard assets are performing assets and which generate income to the bank continuously when ever it becomes due.In actual sense it is not a non performing asset.These assets carries only a nominal risk.

**Sub –Standard assets:**These assets are considered as non performing for a period of 12 months,

**Doubtful assets:**Assets which are considered as non –performing for a period of more than 12 months can be called as doubtful assets.

**Loss assets:**All the assets which remains in the banks as not recoverable come under this category.

**TYPES OF NPA’s**

**Gross NPA:**Gross NPA refers to total quantity of loans that have gone as bad debts.

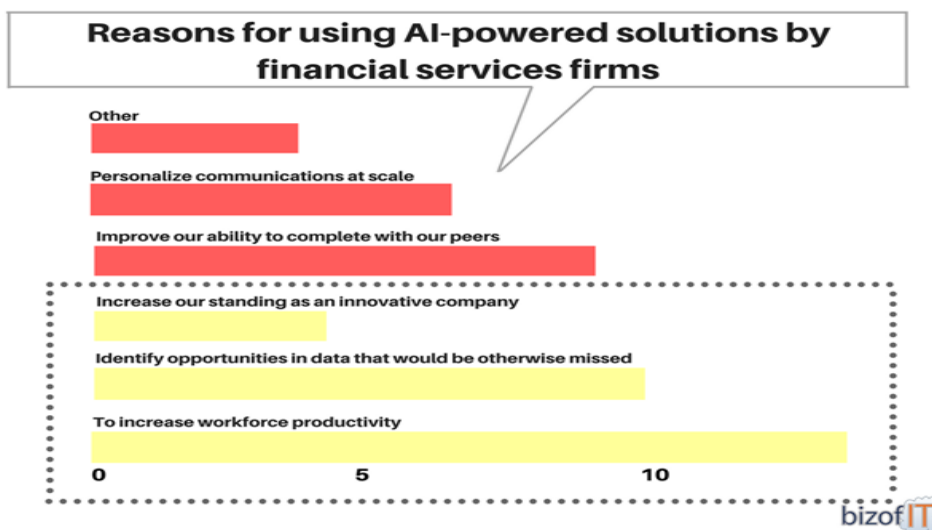
**Net NPA:**Net NPA refers to those Gross NPA after reducing provisions regarding NPA’s

Net NPA=Gross NPA- Provisions/Gross advances- provisions

**Artificial Intelligence(AI):**Artificial intelligence is the combination of three major technological components such as machine learning ,natural language processing and cognitive computing.In order to overcome the barrier of human intelligence scalability the idea of transferring intelligence from human to machine is adopted. AI stimulates the intelligence of humans into artificial machines with the help of most modern learning and natural language processing algorit

**AI & its relevance to Banking**

In the present digitalized economy artificial intelligence has impacted more in the banking industry. In order to meet up the competitive scenarios of the modern world it becomes very crucial to stand as an innovative company in the banking sector. The following graphical representation shows the reasons for AI’s widespread adoption in Banking & Financial Services.



Source: Financial brand.com

**LITERATURE REVIEW**

The Narasimham committee (1991) introduced the concept of non- performing assets on “financial system reform”.The health of the banking sector can be assessed using the quantity of NPA’s.Various studies have been conducted to study the problems faced by NPA’s in India and the use of artificial intelligence in the Indian banking sector.This study tries to trace out the important problems of NPA’s in India as well as the use of artificial intelligence in the management of NPA’s.following studies gives the base for this research work.

NPA broadly defines non payment of loan (Das & Ghosh 2006).According to Bhavani Prasad ,G and Veena(2011) public sector banks has 78% NPA's and that is the reason for their reduction in revenue.

Chetan Dudhe (2007) established correlation between Gross NPA and Net NPA.

Siraj. K. K & Prof. (DR). P. Sudarsanan Pillai ( Feb, 2014) indicates that NPA is a harmful virus affecting banking sector. It affects the liquidity and profitability of the banking sector, in addition posing threat on quality of asset and survival of banks. This study ended that NPA still remains a severe threat and it will affect the efficiency of the credit risk management in the Indian banking sector.

Bhatia (2007) in his research paper titled, "Non-performing assets of Indian public, private and foreign sector banks: An empirical assessment", examined how the application of empirical approach helps in the analysis of the NPA's. Banks financial health can be measured using the quantum of NPA's. He tried to find out the basic and fundamental factors which will impact the level of NPA's among the Indian banks. Two factors were developed it includes macro –economic and bank specific parameters.

Debarsh and Sukanya Goyal (2013) concentrated on management of non-performing assets in the perspective of the public sector banks in India under strict asset classification norms, use of latest technological platform supported Core Banking Solutions, recovery procedures and other bank specific indicators in the context of stringent regulatory framework of the RBI. Non-performing Asset is a crucial parameter with in the analysis of monetary performance of a bank because it leads to decreasing margin and better provisioning needs for NPA. The reduction of non-performing asset is important to enhance profitability of the various banks.

Asha Singh (2013) in her paper titled "Performance of Non-Performing Assets in Indian commercial banks" observed that there is an increase in the NPAs of the public sector banks every year. On the other hand, there is a decreasing trend in the NPA's of the private sector banks regularly except in some years. So reduction in the NPA shows that credit appraisal process of banks have strengthened over the years and increased NPAs shows the importance of provisioning, which help to reduce the overall profitability of banks

According to Nirmal Anil kumar and Dr. Derashri Poorvi (2018) rightly point out that in the new age banking many banks are using the CIBIL data and customer transaction pattern to understand his repayment capacity and in that order they disburse loan and chances are high to recover such loans in the appropriate time, they also suggested that deployment of artificial intelligence chat bots as loan advisors to customers to make their loan process easier.

Dr.Mittal Rajkumar and Suneja deesha examined the magnitude of NPA's in the public sector banks with the private sector banks. They found that NPA's are rapidly increasing in the public sector banks. So in order to increase the profitability and efficiency banks needs to be control its NPA's .

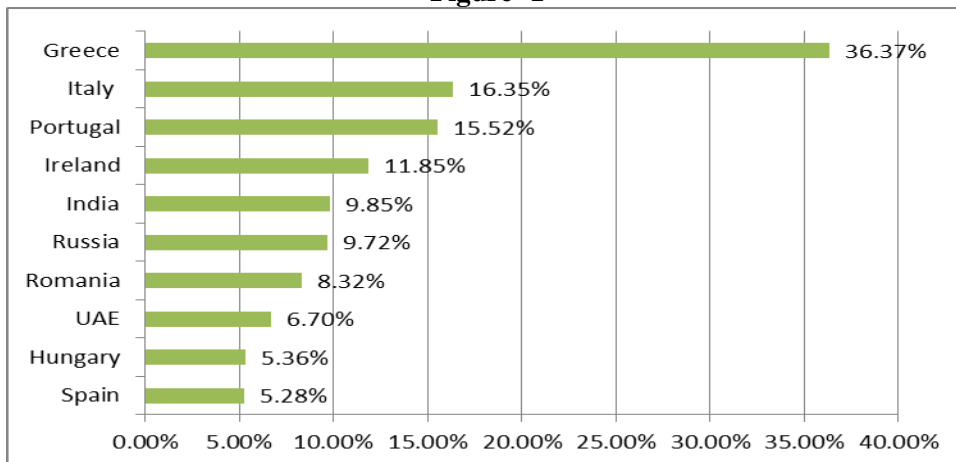
## FINDINGS

Findings from the secondary sources of data includes the following

As we consider the case of Non-performing assets of India it includes 9.85%.The below chart shows that at world level India's rank is 5<sup>th</sup> in the case of NPA's

Non- Performing Asset at World Level and India’s rank

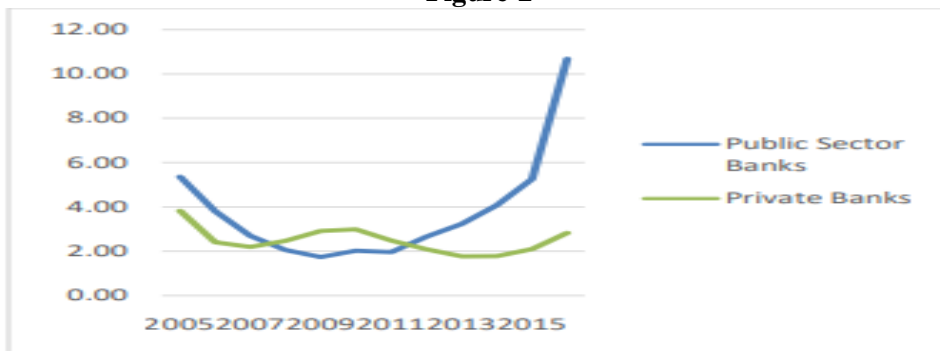
Figure -1



Source: Nirmal Anil kumar and Dr. Derashri Poorvi (2018)

NPA’s of Public Sector Banks and Private Sector Banks

Figure-2

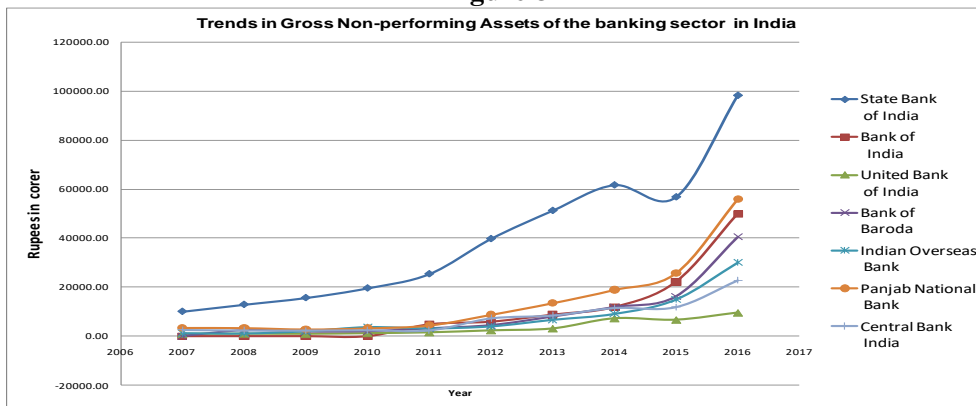


(Source: Database on Indian Economy, Reserve Bank of India, 2005-2016)

Figure -2 shows the flow of NPA’s of Public sector Banks and Private sector Banks. It is clearly showing that NPA’s of Public banks are increasing rapidly and on the other hand NPA’s of Private sector banks shows a decreasing trend.

Non-performing assets of seven banks

Figure-3



Source: Prepared by Chetan Dudhe

From the figure- 3 it is evident that NPA is more in the State bank of India and less in United Bank of India

## 1. Causes of NPA

**1.1 Various Lending Practices implemented by the Banks:** In the year 2008 in India the financial crisis has been happened because of unhealthy lending practices of banks. The banks should strictly follow rules and regulations while providing loans. The credit policy of banks should be properly followed by each and every bank.

**1.2 Business Risk involved:** The problems arising from the operational environment of the business organization results in high business risk

**1.3 Environmental Risk involved:** The environmental hazards such as flood, cyclones, drought which creates environmental risks to the farmers and agriculture based business people

## 2. Impact of NPA

### 2.1 Liquidity position of the banks

Whenever banks are facing the problem of NPA's recovery of money from the borrower is not possible. This will create scarcity of liquid cash in the banks for a short span of time

### 2.2 Credibility loss

When there is problem with NPA banks may lose their goodwill and brand loyalty among the customers and economy this will adversely affect the value of the banks in terms of its credibility and dependability.

### 2.3 Profitability of the bank

Current profitability of the banks as well as the profitability of the entire financial year will be affected by the growth of NPA's in the banks.

## Measures to be taken by government to reduce or recover NPA's in India

**Introduction of SARFAESI Act-** In order to recover the dues from companies which made NPAs and not repaying their dues to the banks governments is given certain power to the banks such as Securitization and Reconstruction of Financial Assets and Enforcement of Securities Interest act. They are putting the stressed asset to auction after applying certain amount of haircut with the reserved price and sell them to best bidding ARC.

**Asset Reconstructions companies-** These are the companies which issue the security receipt to the investors backed by impaired assets. An ARC considers a number of different routes to maximize realization from the assets, including liquidation/settlement/restructuring or rehabilitation and turnaround to ensure payment from the improved operating cash flows of the company. Proceeds, if any, are distributed according to the shareholding of the SRs.

**Lok Adalat / Debt Recovery Tribunal-** The Debts Recovery Tribunals were established by the Government of India under the Act of Parliament (Act 51 of 1993) for time saving assessment and recovery of debts payable to banks and other financial institutions. Under this rule from 1 lakhs to 10 lakhs recovery can be done by DRT. They have not much succeeded.

**Introduction of National Company Law Tribunal:** This is a judicial body in our country that manages the various issues with reference to Indian firms. The NCLT has the power and ability under the Companies Act to adjudicate proceedings: Initiated before the Company Law Board under the Companies Act 1956.

## New Age Technology Usage for Reducing NPAs

RBI has given the banking license to 23 new banks to make a revolution in the Indian banking sector. Few licenses are given to microfinance companies who has local expertise in giving the small loan and few license are given to payment banks to make the transition faster and smoother and delightful and resilient customer experience. RBI trying to infuse as much technology as it can so that customer experience become good with banking system as well as the turnaround time ( TAT) per customer service get reduced. There are tremendous changes in the Indian banking system since 1991 of liberalization and technology as played a

very important role. Today small amount of lending is become quite easy in the sense like HDFC Bank has launched the paper loan where consumer is given the instant loan on the basis of CIBIL track record and by using there Adhar details. Also Banks ICICI and HDFC are doing the trail of ROBO Banking. In the new age banking many banks are using the CIBIL data and customer transaction pattern to understand his repayment capacity and in that order they disburse loan and chances are high to recover such loans in the appropriate time. Use of technology in the asset business of the bank will reduce the overburden and fear of NPA because there won't be any human, political, referential or emotional interference from the bankers. This means the loan would be disburse on the complete competitive background of the customer on the basis of repayment capacity, backing by the sufficient collateral. Data analysis by using the cloud computing, partnering with fin tech companies for data analysis and using the robo banking it taking it to next level. Further the technology will reduce the cost by efficiently making the decision fast of data analysis with the help of Artificial Intelligence. So it will save the time, money, reduce TAT, manpower cost. It will help in higher in more skillful employee in order to increase the efficiency and effectiveness. Once CIBIL data need to be synch with Pan card, all loan record, history of cheque bounce in a year in both saving/current account which definitely help the bankers to sanctioned loan to the right customer and who has the right intention. Still PSBs hold more than 70% of the total customer in India and they are still not upgraded in technology and they holds maximum NPAs out of total 10.25 lakhs crore. Private sector banks having less NPAs but in few cases these become serious. But private sector banks are using the technology efficiently and that is also seen in their balance sheet which shows year on year growth and profit. Now Indian Banks are partnering with fin tech companies which are providing them great technology and with help them using artificial intelligence they are increasing their efficiency. Few examples in the Indian Banks by artificial intelligence are share below ( courtesy deloitte report)Earlier this year, ICICI Bank created "Technology and Digital Group" (TDG) that it hopes will help it develop its technical activities such as commercial, retail and wholesale banking. It is already planning to deploy artificial intelligence chat bots as loan advisors to its customers. Inorder to drive Fin Tech innovation Axis Bank introduced 'Thought Factory' an innovative lab .AXIS Bank also connect with various upcoming digital platforms such as, artificial intelligence, block chain, cloud and mobility to bring about disruptions across functions including Credits, Deposits, Wealth Management, Mobile Payments, and Security. To provide further boost in the digital bank operations HDFC Bank has identified five startups whose services it plans to offer to its customers. In Singapore DBS bank has opened a "mobile-only" bank, in India it is called Digital bank powered by Kasisto. Kasisto handles the tech behind Digital bank, which includes an AI-powered virtual assistant called KAI.KAI can apparently anticipate and answer banking related customer queries in real time. Automation of collection and recovery process, many a times when it require to collect the monthly interest or EMI of loans, a relationship manager has to call or remind the customer if loan are not paid regularly and in big banks like SBI, BOB, PNB, HDFC Bank, ICICI Bank, Axis Bank it is very difficult to check each customer EMI schedule and track their payment. If all the customers EMI schedule is mapped to system and automate them so if any repayment get bounce immediate alert to financial institution risk department and concern relationship team of tagged customer is given. Then it would be easy task to understand the risk related to particular asset from the beginning and then institution can make the remedies related to particular case. While any institution is exercising the recovery drive at one particular time then it is very difficult to collect all them back. Always small amount of money is easy to collect compared to big size loan amounts.

**RECOMMENDATION**

1. Banks need to use robotic technology by linking the RBI guidelines, in order make the loan Disbursements more transparent and so it reaches to the person with high credibility.
2. Technology must be used to link CIBIL data to customer's overall asset and liabilities so that There would be clear cut and transparent idea of his repaying capacity.
3. Technology must be used to analyse the customer intention, end use of funds and his psychic to correlate repayment of loan.

4. Technology must be used to analyse the customer monthly usage of funds to track his activity so if anything unusual found it should be address immediately rather waiting for 90 days and then declare its NPA.

5. Robotic process automation (RPA) if used for the data analysis and data mining, it will simply create a risk free atmosphere for the banks and bankers. As there are lots of political pressure while, disbursing the loan on the bankers.

## CONCLUSION

Recovery of NPAs or Disbursement of loans by using NPA will reduce the man powers errors and ensure the profitability and productivity for the banks. By using technology banks can identify the root cause and so they can offer the flexible solution to the customer and reduce the chances of becoming it NPAs. Big data engineering and data science has created plethora of opportunities in the financial system to make the recovery process smooth and lending process transparent so that over leveraging should not happen to customer. Once over leveraging issue is resolved then half of the problem will get resolved as with help of NCLT, DRT and SARFAESI Act at least financial institution can recover their asset. At same time once the lending process become more transparent using digital methods and financial institution have checked repayment capacity with systematic data mining then problem to NPAs could be reduced to at least 80% and only the genuine cases would be there which are obvious. These genuine cases are due to international economics changes/ trade wars/ dumping duties / Economic reforms. In these cases government can help to industries to get out from the problem.

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