INTERNATIONAL JOURNAL of LEGAL POLICY
Vol. I, Issue 1 (2025)
March, 2025

Disruptive Transformations in Banking Industry and Associated Legal Practices Through AI & ML

- **Upendra Bhardwaj**[1]

Abstract

In this fast moving world, the excessive burden upon the industries is encouraging a reduction in the onus with the assistance of new technologies. Modern technology is also positively intruding various operational processes to make it efficient and prompt. Technologies like Artificial Intelligence (AI) and Machine learning (ML) are performing commendable tasks in making the lives of people and institutions smooth and coherent. Both these innovative technologies are creating disruptive effects in the various processes of society and diverting them from lethargic to efficacious construction. Operational processes in the banking industry and related legal practices are very complex in nature and by solving these intricacies in an intelligent and functional way, Artificial intelligence and Machine learning are proving their worth. The practical confluence of technology and industry shall be appreciated in this research paper. The paper analyses the disruptive way of transformation in the banking industry and legal practices in the industry brought on by Artificial Intelligence and Machine Learning along with the scrutiny as to how future operational and legal functions are being processed and adopted through this lens of AI and Machine Learning. The paper also focuses on how such technologies may prove to be good for positive societal changes without hampering its basic foundation.

Keywords

artificial intelligence, machine Learning, banking industry, legal practices, disruptive transformation

INTRODUCTION

Finance is a very significant aspect of everyday life and after the nationalization of banks in India, the finance industry became the country's backbone. At earlier stages in India, the

[1] Advocate, High Court of Delhi.

structural and operational management of the banking system was not good and it is still not as efficient as it must be for smooth functioning of the country's economy. On top of it, the legal aspects of the banking system are also very complicated and time taking which could not be handled manually. India has become a country with the largest population in the world and catering the banking needs of such a huge population is impossible through mere manual labour. In light of this, use of Artificial intelligence and Machine learning comes handy and thus creates a technological disruption in society.

The use of Artificial intelligence and Machine learning for the banking industry and related legal practices can make the imagery clearer on the line of risks and dangers involved in the industry. Such technological advancements have the capacity to ensure strong and reliable returns to the individual too.[2] AI and ML help ease the plethora of processes of the banking system and these technologies are an excellent way to synchronize the old system with new transformations. Though maintaining the sanctity of old systems with involvement of new technology is a complex task, Artificial intelligence and Machine learning can execute it in a planned way.[3] Thus, for making the banking process modern and digitized, use of AI and Machine Learning is inevitable.

Artificial intelligence and Machine learning work on mathematical functions which can be edited as per the changes and requirements due to the dynamic character of society. Machines work in a more efficient way and the chances of errors are less if the functions used in programming are working well. The chances of success depend upon the pre-research for applying Artificial intelligence in practical operations and matching it with the difficulties available on the ground is an extraordinary task,

[2] Milojević, N., & Redžepagić, S., Prospects of Artificial Intelligence and Machine Learning Application in Banking Risk Management 3 JCBTP 41-57 (2021).

[3] Lee, I., & Shin, Y. J., Machine learning for Enterprises: Applications, Algorithm selection, and Challenges, 63(2) BH 157-170 (2020).

but if once it gets successful then reforms are not away. Society can be blessed with such technologies and processes can be energized by just one button.

BRINGING EFFICACY THROUGH AI AND ML IN BANKING INDUSTRY

There are several processes, each one at a distinct level, that are carried out within the banking business with the intention of ensuring the customers' complete happiness. It takes more time to do these tasks since there are more customers than ever before, and the employees who work in the banking business do not have access to the most up-to-date equipment. Through the use of Artificial intelligence and Machine learning, each and every one of these activities may be changed at a different level.

Operations in Banking Industry

Banking industry secures the money from its customers and multiplies that money by using investment methods. In between there are a number of services for the customers such as passbook printing, loan processing, making of demand draft, withdrawal of money, deposit of money, fund transfer, foreign exchange, etc. Without Artificial intelligence such works take exceptionally longer duration but Artificial intelligence and Machine learning can make it an easy task. However, the technology is not reformed at such a level that the exceptional use of it can be done, special attention needs to be paid for the good use of Artificial intelligence and Machine learning. Use of these technologies will transform the banking industry completely in new colours. Most significantly, it will inevitably change the whole scenario and will leave footprints of real modernization. Some scholars and specialists speculate that Artificial intelligence and machine learning will impact the whole banking industry in a positive way. For the automation of the process, the banking industry needs to enhance its speed for fast results and overwhelming client satisfaction.

AI and ML for Fraud Detection

Financial institutions have long been wary of fraud because of the severe consequences it may have for their bottom lines and their credibility in the community. The advent of AI and ML, however, has provided banks with potent new weapons in the fight against fraudulent operations. As the banking sector deals in sensitive information and valuable things like cash and gold, there is always a threat to its security from criminal minds. In order to have a durable and strong banking system environment, security of its information becomes fundamental as it is very sensitive and directly related to the economy of the country. Eminent banks are working on Artificial intelligence and Machine learning to use them in their business so they can fight such rivals and have a lead on them. As the importance of these disruptive technologies have increased, it has become fundamental for the banks to work on them.[4]

- ***Data Analysis and Pattern Recognition***

  AI and ML algorithms are exceptional when it comes to accurately analysing enormous volumes of data in a short amount of time. These technologies are able to recognise trends and abnormalities that may be indicative of fraudulent actions because they leverage past transaction data, consumer profiles, and data from other sources. Machine learning models may be taught from previous instances of fraud to increase detection skills over time. This enables financial institutions to remain one step ahead of those who commit fraud.

- ***Fraud Monitoring in Real-time***

  Traditional methods of fraud detection frequently rely on rule-based systems that call for manual updates and are restricted in their capacity to react to developing fraud trends. Real-time fraud monitoring is an alternative to these traditional approaches. On the other

[4] Donepudi, P. K., Machine Learning and Artificial Intelligence in Banking, 6(3) AJASE 157-162 (2017).

hand, algorithms powered by AI and ML can monitor transactions in real time, immediately spotting any activity that appears to be suspicious and setting off alarms so that they may be investigated further.[5]

This preventative strategy helps financial institutions to identify fraudulent activity and take corrective action at an early stage, therefore reducing the likelihood of incurring significant financial losses.

- ***Identification of anomalies via Behavioural Biometrics***

  AI and ML algorithms are able to analyse user behaviour, including transactional patterns, device usage, and geographic locations, to generate a baseline of typical activity for each individual client. Behavioural biometrics are used in behavioural biometrics and anomaly detection. Any significant departures from this standard might raise suspicions of fraudulent activity. In addition, AI may employ behavioural biometrics to identify users and detect fraudulent attempts to mimic authorised account holders. Some examples of behavioural biometrics are keystroke dynamics and speech recognition.

- ***Analysis of Networks and Detection of Links***

  Con artists that commit fraud frequently work together with other people or organisations to pull off their schemes. This type of cooperation may be uncovered through network analysis and linkage detection. AI and ML have the capability to investigate intricate networks of transactions and interactions, therefore revealing previously unknown linkages and locating questionable interconnections. Banks are able to obtain useful insights into the structure of fraudulent activities and take necessary steps to disrupt these operations by mapping out these

[5] Kaya, O., Schildbach, J., AG, D. B., & Schneider, S., Artificial intelligence in banking, ARTIFICIAL INTELLIGENCE 47 (2019).

networks and gaining valuable insights into their structure.

Customer service

Supporting the clients is a basic part of the banking system or one may say that it is one of the fundamentals for a banking system which has a frequent effect on the potential clients of the bank. Supporting the clients makes sure that other future clients would pick the bank easily for their banking related works. A prompt customer service has a great effect on the banking system as it connects people to the bank and provides them a smooth support system. Banks are using Artificial intelligence to make their customer service better and enhance their connection and communication with their clients. Artificial intelligence and machine learning has changed the client's support financially by the conversational methods like chatbots, helpline services, feedback and other methods.[6] These processes are providing more efficiency and a bespoke satisfaction to the clients on web and other financial platforms. There are many robotic assistants present now who help virtually by doing conversation with the help of Artificial intelligence. These assistants have well known names such as Alexa, Siri, Cortana and others. They help in finding the right resolution and communicate with the clients and provide a smooth way to operate with the banks. Customers of the banks can use these assistants by just one click on their screens by messaging or tapping their orders.

AI and machine learning technologies make it possible for banks to provide individualised financial services that are catered to the specific requirements of each individual consumer. Banks are able to get a more in-depth insight of the preferences, spending patterns, and financial aspirations of their customers through the use of data analytics and predictive modelling. Because of this, they are able to provide individualised recommendations for products,

[6] Boobier, T., AI And The Future Of Banking 67 (John Wiley & Sons 2020).

individualised investment portfolios, and tailored marketing efforts. Banks may increase client loyalty and establish long-term connections by harnessing insights generated by AI.

Credit Service and Loan Decisions

Artificial intelligence and Machine learning provide a platform by which the banks can easily calculate the risks related to every individual, give valuable returns for their investment in the banks and as a consequence, a very few people would default for their credits, decreasing the menace of Non-performing Assets (NPAs). Before taking any loan or service of any monetary value, people may verify them by looking into the financial assessments, records and past image and practices of any banking institution, enabling them to make informed decisions.[7] It is just a perfect science and nothing else and the same technology will provide a resolution to banks too as they often lose their cash flow because of inaccurate information from creditors. Credit score will highlight certain security, moral, and genuine concerns for each client through their respective banks, and Artificial intelligence and Machine learning will be utilized to explore elective information in advance.

With Artificial intelligence and Machine learning, banking sectors may be able to make a possible pardon giving credit to people who are in grave danger. If some of these new enterprises succeed, it will almost certainly lead to other, less cautious forays into the industry.

Meeting the Regulatory Compliances

Now-a-days banks, with the use of Artificial intelligence and Machine learning are capable of easily identifying the extortion by doing regular investigation and incorporating network safety systems with them. Banks are the most important part of the economy of any country as economic conditions of a country are directly affected by its banks. Thus it is important for the banking institutions to follow the directions of the government strictly and keep themselves

[7] Singh, K., Banks Banking on AI, 9(9) IJARMSS 1-11, (2020).

away from the violations of rules which affects monetary values of a country.

Artificial intelligence and Machine learning can be used to examine the conduct of clients at their best in comparison to other instruments and also can be used to answer the administrative frameworks easily related to the other data, that will reduce the engagement of humans which inturn will provide more benefit to the banks. The use of Artificial intelligence and Machine learning has been on the increase, so it is necessary to make relevant rules regarding these monetary changes taking place in the industry.

Finally, it is critical to ensure that enterprises strike a balance between lowering costs of services for their customers while allowing the company to advance through Artificial Intelligence and Machine Learning breakthroughs in order to develop and provide exceptional customer service and fantastic client products. The adoption of these emerging technologies in the banking sector is set to transform the industry, allowing banks to provide higher levels of significant value, highly customized experiences to their customers, reduction of risks, and expansion of opportunities associated with being the monetary engines of our advanced economy.

LEGAL PRACTICES IN BANKING INDUSTRY AND USE OF AI & ML

Banking industry is not away from law and legal practices. Whether it is a matter of grant of loan or debt recovery, laws play a significant role. To make the processing of law and legal practices easy, technological advancements are involved with laws in every aspect ranging from drafting a contract till its execution, from issuing of loan till its recovery, etc. is inevitable. Without the inclusion of Artificial intelligence, handling such a large number of tasks is tedious.

Issuing of Loan and Recovery

The major portion of the earnings of the banks are from the interests paid by debtors on their loans. Issuing loans and collecting on them are important functions of the banking sector. Manual

evaluations are frequently used in conventional approaches, although these may be laborious, inaccurate, and wasteful. However, for the further channelization, the recovery of the debt is also necessary. The Recovery of Debts due to Banking and Financial Institution Act, 1993 deals with such issues.

Artificial intelligence (AI) and Machine learning (ML) have been integrated to transform the loan lifecycle, providing banks and financial institutions with cutting-edge resources to boost decision making, expedite operations, and increase repayment success.[8] Though new advancements and amendments have been made in it to overcome the complexities involved in the recovery of debt, the use of Artificial intelligence in deciding the main liability may be an efficient plus factor. Major issues of Non-performing Assets (NPAs) and non recovery of debts can be achieved just by mindful use of Artificial intelligence and Machine learning.

- ***Enhanced Credit Risk Assessment***
  Artificial intelligence (AI) and Machine learning (ML) algorithms can analyse massive volumes of data, such as a borrower's credit history, financial statements, work records, and social media profiles, to better gauge their trustworthiness. More precise risk assessments are made possible by these technological advancements' ability to reveal patterns, correlations, and forecast insights.[9] AI and ML models can give a more complete picture of the borrower's creditworthiness by including alternative data sources and non-traditional indications in the loan approval process.

- ***Individualised Loan Proposals***
  Artificial intelligence and Machine learning algorithms may analyse consumer information, purchases, and spending habits to provide

[8] Biswas, S., Carson, B., Chung, V., Singh, S., & Thomas R., AI-Bank Of The Future: Can Banks Meet The AI Challenge 14 (Mckinsey & Company 2020).

[9] Yu, T. R., & Song, X., Big Data and Artificial Intelligence in the Banking Industry, Handbook Of Financial Econometrics, Mathematics, Statistics, And Machine Learning 4025-4041 (2021).

individualised loan packages. Banks may target specific client subsets, offer individualised loan packages, and establish competitive interest and payment conditions by employing predictive modelling and data analytics. Customers are more satisfied, loan approval rates are higher, and loyalty is boosted when businesses put in the extra effort to tailor their services to each individual.

- ***Optimising Collections and Recovery of Debt***

  Default rates can be lowered and recovery results improved with the use of AI and ML-based strategies aimed at optimising the collection and recovery process. Artificial intelligence systems can assess the probability of default and the chance of recovery by analysing borrower behaviour, financial data, and external circumstances. This allows financial institutions to prioritise collections operations, distribute resources efficiently, and develop unique plans for recovering from debt with different debtors. In addition to boosting client interaction and eliminating manual involvement, AI-driven collection solutions may automate communication and payment reminders.

Prevention of Money Laundering

The calculations of Artificial intelligence and Machine learning can be induced towards efficacious construction to tackle the problem of money laundering. For tracing the data and detecting the matter and manner of money laundering at the primitive stage, the technology of AI and ML can be remarkable steps.[10] Banks face serious challenges in dealing with cases of money laundering and due to its adverse impact, other socio-economic and political activities also get affected. One of the primary institutions often afflicted by money launderers are banks for the reason of their higher convenience, accessibility and safety for

[10] Hassani, H., Huang, X., Silva, E., & Ghodsi, M., Deep learning and implementations in banking, 7(3) ADS, 433-446 (2020).

people involved in money laundering.[11] Thus, the banking and financial institutions can necessarily act as a strong line of defence in the fight against money launderers. The authorities accountable for anti-money laundering need to keep pace with the development in technology particularly Artificial intelligence, computer softwares, Machine learning and block chain, etc. For instance, the recommendations of the Financial Action Task Force (FATF) under Rule 19 advises the banks to give import to technical training of the staff members for the detection and prevention of money laundering activities.

Foreign Exchange Management

Artificial intelligence minimizes the risk of human error by automating the bulk of daily ventures. Foreign exchange transactions which are facilitated by banking and financial institutions are also profiting from Artificial intelligence and Machine learning. Traders in foreign exchange are also being greatly benefitted by the involvement of Artificial intelligence. For instance, to ensure the minimization of failure risks, the traders and banking institutions of foreign exchange rely on the use of Artificial intelligence and perform predictive analytics via which they are able to analyze vast data with minimum effort and thus streamline the foreign exchange trading process. Artificial intelligence can also help the traders and banks in identifying key predicaments, solve them instantaneously and to track their performance in real-time.

The value of foreign exchange for any country contributes significantly in building a strong treasure for any import or export. This also assists the country's economic health to achieve the financial goals of the people and institutions. The organized use of Artificial intelligence can speculate the future transactions to concrete the present scenario with the synergetic approach of the nation.

[11] Kaur, D., Sahdev, S. L., Sharma, D., & Siddiqui, L., Banking 4.0: The Influence of Artificial Intelligence on the Banking Industry & How AI Is Changing the Face of Modern Day Banks, 11(6) IJM (2020).

AI AND MACHINE LEARNING IN FINANCE SECTOR

Artificial Intelligence and Machine Learning works well by extracting valuable data from raw data and making it impactful insight for the future. There are various ways where the use of these disruptive technologies can be done to improve the financial sector.

Financial Monitoring

The algorithm of Machine learning can be used for financial monitoring and such applications of Machine learning are of great benefit. Machine learning has the high chances of robust development and reforms in the financial sector.[12]

- ***Backtesting and Performance Evaluation***

  The use of AI and ML enables investors to evaluate the success of their investing strategies by 'backtesting' them on previous data. The effectiveness of investing strategies may be evaluated by replicating prior market situations and testing them on historical data. Backtesting is useful for discovering flaws, honing investing strategies, and increasing returns.

Making Investment Predictions

Making sound investment selections in the financial markets is difficult and requires in-depth research into a wide range of factors and market movements. For making investment predictions, Artificial intelligence and Machine learning can be remarkable. Such technologies can set an absolute benchmark which can not be broken.[13] With the analysis of past data future analysis can be done easily and for such technological advancements are appropriate.

- ***Analytics for Market Prediction***

  When it comes to building predictive models that may foretell future

[12] Aziz, S., & Dowling, M. Machine Learning And AI For Risk Management In Disrupting Finance 33-50 (Palgrave Pivot Cham. 2019).

[13] Truby, J., Brown, R., & Dahdal, A., Banking On AI: Mandating A Proactive Approach To Ai Regulation In The Financial Sector, 14(2) LAW AND FINANCIAL MARKETS REVIEW 110-120 (2020).

market moves, AI and ML technologies shine. These models are able to predict future market trends and price changes by analysing past data and being trained by ML algorithms. Potential investment opportunities, risk assessments, and optimal portfolio allocations may all be made with the use of predictive analytics.

- ***Analysing Market Attitude***
  Sentiment analysis uses AI and ML methods to read between the lines of online discussions, news stories, and other textual data in order to predict market behaviour. These tools can provide light on market and investor mood by analysing the tone, context, and sentiment of conversations about the market. To better understand the market and make judgements based on public opinion, investors can use this data.

Process Automation

For the automation of the existing financial processes, Artificial intelligence is already contributing a lot and will be achieving great heights in future. Machine learning is an added tool to give extra speed to the processes and inculcating it in a structured form.

- ***Automated Trading***
  Automated trading and algorithmic trading systems make extensive use of AI and ML technology. These systems use ML algorithms to do real-time analysis of market data, trade execution, and portfolio management. Investors may take advantage of market opportunities and respond swiftly to shifting market circumstances by automating trading choices based on predetermined rules and market signals.[14] Trading algorithms allow for rapid transaction execution, boosting productivity and mitigating the influence of human emotions on financial choices.

[14] Romao, M., Costa, J., & Costa, C. J., Robotic Process Automation: A Case Study In The Banking Industry, 14th Iberian Conference on information systems and technologies (CISTI) 1-6 IEEE (2019)

- ***Robo-advisors***
  Investment advice and portfolio management are provided in an automated fashion by robo-advisors, which are AI-powered platforms. These services analyse potential customers' risk tolerance, financial objectives, and investing preferences using AI and ML algorithms. Robo-advisors are computer programmes that analyse an investor's financial situation and market history to provide investment recommendations and manage the investor's portfolio. Robo-advisers, or automated financial advisors, provide low-cost and easy-to-use investing strategies, especially for individuals.

Secure Transactions

For providing safe and secure transactions to the parties and intermediaries, Artificial intelligence and Machine learning are doing great jobs. Technologies like these help in pre-detection of any possible fraud and smoothen the safe and secure transaction. Humans are full of errors but the technology of Machine learning can do millions of calculations in one go with the least error possible.

Risk Management

There is always a risk in every work whether it is related to finance or any other thing. Risk management has become a one of the prominent factors in every industry but the skills of humans are limited coupled with blurry memory.[15] Artificial Intelligence and Machine learning systems can provide a robust and organized set up of managing the risks.

CHALLENGES AND ETHICAL CONCERNS

The application of artificial intelligence and machine learning in the banking sector brings with it a plethora of benefits; yet, there are problems and ethical issues that need to be addressed. The confidentiality, integrity, and

[15] Leo, M., Sharma, S., & Maddulety, K., Machine learning in banking risk management: A literature review 7(1), RISKS 29 (2019).

accessibility of one's data are of the utmost importance. Banks are required to take measures to secure the data of their customers and to use that data in a responsible manner, all while complying to stringent data protection requirements. In addition, biases in the algorithms used by AI systems need to be addressed in order to eliminate discriminatory practices and guarantee equitable results.

Data Confidentiality and Safety

Protecting the privacy and security of sensitive consumer information is a major concern. Artificial intelligence and machine learning algorithms require massive volumes of data, especially sensitive financial information. To preserve their customers' privacy, banks should use advanced data protection methods including encryption, access limits, and data anonymization. In addition, there should be explicit permission methods and data management practices that are visible to customers so they understand how their information will be utilised.

Inherent Prejudice and Discrimination

Since AI and ML models are typically trained using historical data, such data may itself be biased or prejudiced. The algorithms may be perpetuating or amplifying discriminatory tendencies present in the training data. Financial institutions must rigorously curate training datasets, eliminate biases, and conduct frequent algorithm audits to prevent unfair lending, credit scoring, and other banking practices.

Meeting the Regulatory Compliances

The fast development of AI and ML technology has outstripped regulatory frameworks, creating difficulties for financial institutions in maintaining compliance. Data protection laws, anti-money laundering rules, and consumer protection standards are just some of the laws and regulations that financial institutions need to comply with.[16] The unique difficulties and

[16] Lau, T., & Leimer, B. The era of connectedness: How AI will help deliver the future of banking, 3(3) JOURNAL OF DIGITAL BANKING, 215-231 (2019).

dangers of using AI and ML in financial services activities necessitate revisions to existing compliance frameworks.

CONCLUSION & WAY AHEAD

The use of Artificial intelligence is unlimited and it is spreading its reach in every aspect of life. Banking industry and related legal practices are full of complexities. Detecting loopholes in the real time transaction is a tiresome and impossible task. Automation of the complete system is in dire need of the time to make an impeccable effect on the entire banking system. Artificial intelligence and machine learning can make the system intelligibly automated with efficient results. Technology of automation can make the entire system hassle free for real growth. Though the system is working in many aspects, it is still lagging and desirable implementations are required to be achieved by the banking institutions.

The researcher makes following few recommendations for the banking industry to disrupt the technology using Artificial intelligence and Machine learning :

- A data-based financial system that cannot be tricked by unidentified criminals is vital for the future. It requires a dependable data infrastructure that is centrally located and maintained by a single government body. Artificial intelligence (AI) could be used for smart automation inside the system to guarantee efficiency and reduce the possibility of manipulation.
- Further, the banking industry may reach unprecedented levels of productivity by embracing the use of technology. Allocating and managing resources in accordance with AI and ML concepts is essential. Banks may save time and money by adopting these technologies, which will boost their efficiency and effectiveness.
- Real financial crimes can be avoided if proper emphasis is placed on the enforcement of banking rules from the start of their implementation. Training programmes for banking

officers should be a top priority, giving them the knowledge and confidence they need to work with artificial intelligence and machine learning.

- Also, governments need to do their part by taking initiatives like encouraging cross-border sharing of technologies. Together, we can accelerate the revolutionary potential of artificial intelligence and machine learning in the financial industry.
- Experts in the field are important to this endeavour. Their knowledge can serve as a road map for implementing AI in the form of smart systems. The banking sector may benefit greatly from their expertise in the implementation and use of AI by tapping into their wealth of knowledge.
- Finally, the governments should encourage the use of AI and ML because of their potential to spur transformative technology changes in the financial sector. Banks may improve efficiency, security, and customer experience by adopting these innovations and the requisite regulatory frameworks.

Banks will be able to more efficiently comply with regulatory standards, deliver personalised services, automate procedures, identify fraud, and more thanks to technology driven by Artificial intelligence. However, it is essential for financial institutions to strike a balance between the rapid development of technology and ethical concerns, with the protection of consumer data, fairness, and security taking precedence.