ROLE OF ARTIFICIAL INTELLIGENCE IN FINANCIAL FRAUD DETECTION

Birajit Mohanty, Manipal University Jaipur
Aashima, Manipal University Jaipur
Shweta Mishra, Manipal University Jaipur

ABSTRACT

AI has changed the way we use to go about our business and certainly emerged as an undeniable and irresistible reality of our times. Technology has touched upon all the sectors and played a decisive role in service delivery. The financial and banking services are leveraging on various facets and tools available, owing to technological advancements, providing them with competitive advantages in the hyper competitive business landscape. There are many Artificial Intelligence based technologies and solutions like Teradata, Feedzai, Riskified, Clari5, Razorpay Third watch, AdvaRisk, Kount etc., that have played a decisive role not only in bringing down the instances of frauds but also scaling up the efficiency and effectiveness of the business operations. In the paper a sincere attempt is being made to analyse and evaluate various Artificial Intelligence based solutions and its impact on the betterment of the business landscape. It is found that Artificial Intelligence has been a game changer and has got wider ramifications than just bringing down the instances of financial frauds in the form of increased efficiency and cost savings. This proved to be instrumental in maintaining and enhancing the reputation of the banking entity.

Keywords: Artificial Intelligence, Machine Learning, Algorithms, Finance, Fraud Detection.

JEL Classification:- G21, G32, 033, M41,M48, M49.

INTRODUCTION

The emergence of Artificial Intelligence has brought about many changes in the business landscape and touted as the next big thing, by virtue of being a force of constructive disruption in the realm of technological advancements, it is capable of turning the things on its head. The financial service delivery has remained untouched by the transformational impacts of the AI, which has made the banking services far more dynamic and relevant in the changing context.

The banking and financial industry have embraced the technological advances to improve its operational efficiency, thereby achieving better customer satisfaction. The Artificial Intelligence based solutions are majorly working on two strands- securing the business operations and scaling up the effectiveness of the service delivery through timely interventions and continuous improvements. The Artificial Intelligence based technologies have provided much needed impetus to the innovation agenda and played a critical role in extending customized and creative solutions to the stakeholders in the current era of digitalisation of financial and banking services.

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The phenomena of Artificial Intelligence is primarily centered on imbibing the natural intelligence as associated with the humans in the machines like the ability to analyse, understands the undying patterns, assess, and draw inferences in a logical way to reach to draw the judgement in scientific manner. It further includes the ability to learn from the experiences and improve upon the same on the evolution curve.

The Artificial Intelligence aims at mimicking the human brain to analyse an extensive volume of complications applying all-inclusive approach. Artificial Intelligence is a technological application that does a wide spectrum of functions like learning from par experiences, rationalisation, interacting with various factors, inventiveness, and solving the underlying problems.

The role of age-old physical devices such as sensors and detectors has reduced in a drastic manner in the present era of digitalisation. Various defense mechanisms comprising of firewalls, virus guard & password fortification, and internal control review are frequently resorted to gauge and control frauds (Jang-Jaccard and Nepal, 2014).

The advanced tools and methods of combating financial frauds like data mining, forensic accounting and auditing, and digital investigation application are not applied at an expansive manner, owing to the cost issues. Even more eye opening is the fact that the most vulnerable small organisations have largely been laggard as the cost benefit matrix has been often loaded against them.

Owing to the developments in information and communication based technologies, the digital and virtual platforms have been increasingly used by anti-social and criminal elements to effect cybercrimes and online nuisance. In order to mitigate such possible crimes and threats, the banks are left with very little option but to resort to artificial intelligence to strengthen its defenses.

Therefore, to stay ahead on the curve, it is no more a luxury for the agencies to come up with innovative methods and techniques to prevent, detect and control the financial frauds keeping a close eye on the technological advancements.

Significance of the Study

Artificial Intelligence based technologies have certainly emerged as a decisive mechanism to gauge and control the increased instances of economic crimes and financial frauds, owing to its capabilities and unprecedented degree of efficiency and effectiveness. Artificial Intelligence can be used to analyze huge numbers of transactions in order to uncover the presence of anomaly, trends of financial crimes, unanticipated developments etc. The same can play an instrumental role in comprehensive detection and prevention of the fraud in real-time manner.

Various Artificial Intelligence based solutions, platforms and algorithm are available, which are addressing the range of issues and vulnerabilities, the banking and financial institutions have been exposed to in the current era of virtualization. There are many Artificial Intelligence based solutions available including *Teradata*, *Feedzai* etc. that helps to prevent all the fraud cases in the financial sectors of India (emerj.com, 2021). There are many leading Artificial Intelligence based technologies like Clari5, Razorpay Third watch, AdvaRisk that can be of great application in the banking sectors and payment gateways in India to ensure the security against the financial frauds at the time of online payments (analyticsindiamag.com, 2021).

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Therefore, the present research study has been directed towards developing an understanding of the various Artificial Intelligence based solutions available to secure the cyberspace, in specific reference to the banking and financial services.

REVIEW OF LITERATURE

Various studies and research findings have indicated that billions of dollars are lost or siphoned off the banking and financial system every year owing to various acts of negligence, omissions and commissions, chiefly by the criminal elements. With unprecedented advancement in technological domain, the financial crimes and economic offences have shifted to the virtual domain. Accordingly, in order to secure the business operations and its assets, various organisations have been utilizing a range of Artificial Intelligence driven solutions and algorithms.

Loebbecke and Willingham (1988) offered a model driven on "the likelihood of financial statement manipulation owing to three major factors namely- the gradation to which those in authority have reason to commit financial fraud, the degree to which prevailing conditions are instrumental in committing these frauds, and the range to which those in authority have an attitude or values" that would be instrumental in committing such frauds.

Some of the major corporate financial scandals like Enron, WorldCom, Tyco, etc., have raised concerns about fraud, wiped out billions of dollars of shareholder value, and led to the erosion of investor confidence in financial markets (Peterson and Buckhoff, 2004; Rezaee et al., 2004). Globally, the average estimated loss per organization from economic crimes is $2,199,930 over a couple of years times (Price Waterhouse Coopers). In the USA, the Association of Certified Fraud Examiners (ACFE) estimates that "about 6% of firm revenues, or $660 billion, is lost per year as the result of occupational fraud (Association of Certified Fraud Examiners, 2004)".

Hasham et al. (2019) stated that "ability of machines as well as human thinking, reasoning, and decision making are maintained by artificial intelligence techniques". According to Kaya et al. (2019), "advanced computation technologies are mainly combined with artificial intelligence that varies with degrees of maturity". Artificial Intelligence has tremendous capability to maintain huge quantum of data and tremendous computational capabilities.

Vieira and Sehgal (2018) pointed out that "Denial-of-service attacks, infrastructure attacks, and other issues around data protection are a major part of high profiling cyber-attacks". The seventy percentage of CEOs of banking organisations and capital market rated dangers in cyber security domain as decisive threat to their developmental agenda. The impact of security breaches on financial institutions has been more than 300 times as compared to other service industries. These include *Clearscale,* which is used by most of the e-commerce industries and is responsible for the highest customer retention rates to the e-commerce industries (g2.com, 2021). As stated by Alsayed and Bilgrami, (2017), online transaction platforms are the most vulnerable to fraudulent transactions. According to a report of 2020 it has been found that RBI which stands for Reserve Banks of India has been reported with fraudulent activities worth's around 1.85 trillion in Indian rupees (statista.com, 2021).

The report of Global Innovation Index (GII) 2021, there are various Artificial Intelligence technology based solutions that are used globally for providing utmost security to customers and other stakeholders. Further, the concept of Machine Learning is used by entities across the globe to prevent and bring down the events of possible financial frauds.

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Malali and Gopalakrishnan (2020) pointed out that owing to advanced technologies, complicated fraudulent complex fraudulent events are gauged more efficiently and therefore, has ability to scale up the digital performance of the e-commerce businesses along with banking sectors. A recent study undertaken by fraud examiners like KPMG, ACFE, and PWC drove home the point that the application of Artificial Intelligence based technologies are capable of much early detection as compared to manual methods. In the case of the banking sector, around 270,000 fraud cases of credit cards have been found globally (deltecbank.com, 2021).

The ACFE research shows that around 13% of global organizations are using Artificial Intelligence technologies for detecting fraudulent activities (forbes.com, 2021). Artificial Intelligence based technologies such as Teradata and Datavisor are used by most of the financial service providers as they deliver utmost security to the customers by preventing them from scamming.

Kumar, Muckley, Pham, and Ryan (2018) pointed out that SVM-based approach brings down through reducing the quantum of time needed for human assessment of possible fraudulent transactions. It is further added that there are range of non-financial rewards of implementing Artificial Intelligence based technologies for sensing and preventing instances of money laundering.

Moreover, Artificial Intelligence based technologies by managing the monotonous work, drastically bring down the workload on human, and thereby improves the decision quality. Finally, by ensuring the protection of its customers against potential frauds, the trust of the client can be further reposited and enhancing the reputation of the financial institute.

AI plays an instrumental role for the banking entities to comply with the regulations in efficient and effective manner, keep a tap on fraudulent activities and early detection & reporting of the possible threats. Such technologies are better placed for better segmentation, targeting and positioning of the banking products in a cost-effective manner.

However, such technologies can prove to be intrusive in nature and therefore, the privacy of the stakeholders (primarily customers and employees) is of major concern and it is of major importance to keep the interests of all the concerned intact and enhanced.

Research Questions and Hypothesis Development

Artificial intelligence technologies are infiltrating financial and banking sectors at across the geographical territories. The application of these technologies in financial sector and banking domain throws up unprecedented opportunities for the financial institutions to streamline their business processes through timely intervention of appropriate technologies. These institutions can optimize their resources by leveraging on big and versatile data sources to overcome obstacles like cyber-crimes, frauds, economic crimes, etc. and enhances overall efficiency of the service delivery across the board.

Artificial Intelligence based solutions help banking and other lending institutions to analyze and evaluate the critical information to establish the financial soundness of potential borrowers. The range of information that helps in establishing the solvency of the borrowers comprises of prescribed identification, credit history, income tax returns, financial transactions, and net worth.

Financial institutions are vulnerable to a wide range of risks, including cyber fraud, money laundering, and the financing of terrorism. In order to combat these threats, financial institutions undertake know-your customer (KYC) and anti-money laundering and countering

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financing of terrorism (AML/CTF). Detection of fraud and anomalies is among the most commonly cited reasons for adoption of Artificial Intelligence by financial service providers. Against this background, the present study is driven by chief reason of understanding the various Artificial Intelligence based solutions resorted to in the banking services to gauge and control the instances of financial frauds.

Research Questions

Accordingly, the study is motivated by the following research questions:

(i) What are various Artificial Intelligence based solutions used in the financial sector to gauge financial frauds?

(ii) (ii) What are the impacts of such Artificial Intelligence based solutions on the performance of the service delivery?

Hypothesis

H_O: *There is no role of tools of Artificial Intelligence in the detection and prevention of financial frauds.*

H_1: *There is role of tools of Artificial Intelligence in the detection and prevention of financial frauds*.

Objectives of the Study

- To recognize fraud detection software as well as techniques that are used in the financial and banking sector.
- To examine the role of the Artificial Intelligence based solution on the overall performance of the financial and banking sector.

RESEARCH METHODOLOGY

Most of the financial sectors in India and the world are facing a huge number of fraud cases in online transactions. Most of the people in India face this fraud case due to their negligence in online transactions (Maedche et al. 2019). The study is based on the various Artificial Intelligence based solutions used across the globe in order to detect and prevent financial frauds. The Artificial Intelligence based fintech firms have adopted various technologies, which are generally based on RPA (Robotic process automation), Deep Learning and Machine learning technologies owing to their efficacy and effectiveness in early detection of the potential frauds. The financial institutions majorly driven on ensuring the KYCs for safeguarding the interests of the stakeholders.

A report from Trans Union (2021) pointed out that "globally online fraud attempt rates for financial services rose 149% between Q4 of 2020 and Q1 of 2021 alone. In 2020 alone, total financial losses from identity fraud were around $13 billion, according to results from Javelin's Identity Fraud Survey: Shifting Angles (2021)". Moreover, in 2021, Szmigiera (2021) predicted that "*the value of fraudulent transactions made with payment cards worldwide accounted for more than $32 billion, which is expected to touch $38.5 billion by 2027*".

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According to Accenture's Banking Consumer Study (2020) "Banking Consumer Study: Making digital more human", based on "interviews of 47,000 banking customers in 28 markets, some 33,000 banking customers found 54% want tools to help them monitor their budget and make real-time spending adjustments". Further, 41% are "very willing" to use computer-generated banking advice?

In India, there has been an unprecedented increase in the telephonic scamming especially during COVID-19 pandemic. This vouches for shift on focus to the surveillance system and checks balances driven on the back of AI-based technologies. According to a report of 2021, it has been found that the instances of fraudulent activities in India have increased to 28% during the COVID-19 crisis. Another report of 2020 represents that India has ranked at top 10 positions according to the elevated rates of telephonic scamming risks. Therefore, it is matter of grave concern for the financial services providers, digital marketing platforms and e-commerce merchants to rise to the challenge in order to provide a sense of security to the customers.

Sadly, India still does not have proper and adequate policy pertaining to the protection of the data and privacy of the clients (Financial Express 2020). Reserve Bank of India (RBI) is required to pull up the socks and come up with proper regulations on emerging and dynamic technologies, data privacy; in order to secure the interest of all the concerned parties.

Fintech News (2021) reported that financial organizations are resorting to Artificial Intelligence-based systems at a wider scale, which is apparent given the fact that more than $217 billion spent on technologies that are potent in early detection of the frauds. Moreover, 64% of financial services providers have confidence in Artificial Intelligence to prevent the frauds by remaining ahead of the fraudsters.

For the purpose of undertaking the research endeavor, various Artificial Intelligence based solutions used across the globe has been studied and role of the same of the same in detection of the financial frauds has been analyzed.

Study and Analysis of Artificial Intelligence based Solutions

The adoption of Artificial Intelligence in banking domain has largely been in the nascent stage of evolution. The application of the same has been confined to addressing specific issues like handling extraction of the data (from large documents), detecting patterns of money-laundering, managing customer queries in a holistic and efficient manner.

Wells (2004) pointed out that "Fraud prevention is a more viable strategy since it is often difficult to recover fraud losses once they are detected". Accordingly, it is better for the financial entities and their auditors to deal with fraud and financial crimes in a holistic manner rather than ad hoc or standalone manner.

With the developments in the information technology, frauds and economic crimes are spreading all over the world, resulting in huge financial setbacks, reputational degradation and trust deficit.

In this section, some of the major Artificial Intelligence based solutions resorted to by various financial and banking institutions along with the impact of the same has been discussed and deliberated upon. There are many Artificial Intelligence based solution provided by a range of AI-powered fintech to help banking and financial service providers to safeguard interest of their stakeholders, secure operational efficiency and to scale up the overall business performance.

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Mentioned below are some of major Artificial Intelligence based solutions opted by the financial service providers along with the impact of the same on various parameters:-

Citi Group and Feedzai (feedzai.com, 2018)

In 2018, the Treasury and Trade Solutions (TTS) of Citi Group move into a strategic partnership with Feedzai, a leader in Artificial intelligence (AI). The primary goal was to assess and manage the real-time risk across the operations. Feedzai's machine learning technology is capable enough to measure up the anomaly in the payment behaviour and other discrepancies of client in an automatic control manner, automatically adjusts controls to monitor discrepancies and changes in client payment behaviour, thereby zeroing down on the potential anomalies in banking services. This has been done without compromising on the speed and efficiency of the service delivery.

Feedzai claimed that its advanced Artificial Intelligence technological solutions has led to 42% fall in false positives. Further, it reported a 53% enhancement in cost savings owing to the technological upgradation. Finally, the approval of the new accounts jumped by 74%.

HSBC and Ayasdi (ayasdi.com, 2017)

In 2018, HSBC aimed at reducing the cost and time associated with the current traditional manner of undertaking the investigations, which was done by the humans. Accordingly, the bank roped in Ayasdi's Artificial Intelligence solution.

As a result, HSBC partnered with Ayasdi to develop an AI-enabled anti-money laundering solution with the primary target of scaling up the efficiency of its banking operations in the Know Your Customers Customer (KYCC) area by 3% (stretch goal of 5%).

A reduction of more than 20% was reported in the investigative volumes, owing to Ayasdi's AML solution. Moreover, it was able to detect various behavioural patterns directly related to financial crimes and frauds. It helped HSBC to prevent the possible frauds and instances of money laundering by restricting the payments before regulations were violated.

This was achieved by Ayasdi by deeply analysing the available SWIFT message data and accordingly, adding a number of features for building an appropriate and relevant ML algorithm like incorporation of data pertaining to transacts customers and risk.

Ayasdi's solutions are chiefly driven on the technology that detects anomaly, having capability to recognize deviations from the normal or standardised pattern. Anomaly detection software has played a decisive role and worked well for HSBC and other banks in scaling up the defense system against money laundering.

Danske Bank & Teradata (teradata.com, 2017)

In 2017, the Danske Bank was subjected to continuous rise in the sophisticated and complex types of fraud. The bank was chiefly concerned about the below par rate of fraud detection (40%) and was daily experiencing around 1200 false positives. This left bank with no other option but to rope in Teradata for modernising its fraud detection and defense system.

Resultantly, due to the intervention by Teradata through the application of Artificial Intelligence and other advanced analytical techniques, the bank achieved better results. The false positives plummeted by 60% (with stretch goal of 80%) and fraud detection enhanced by 50%.

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This facilitated the bank to concentrate on real instances of fraud and gauging new methods and techniques of frauds.

Teradata applied one of most potent AI's application called NLP chatbots. It automates some of the transactions done by the customers. This Artificial Intelligence application has got wide acceptance among the financial service providers including banks.

Nonetheless, the most important utilization of Artificial Intelligence in banks has been Anomaly Detection- which enables financial cybersecurity, checks money laundering activities and automates the process of zeroing down on bank frauds.

Teradata claimed that its Artificial Intelligence based solutions were able to achieve 20% reduction in false positives pertaining to frauds. Its technological solutions have been able to validate the identity of the customers with an accuracy of more than 95%. Moreover, it has been equally capable in detecting the synthetic account to the tune of 5%.

Clari5- Enterprise Fraud Management (EFM) System (clari5.com, 2021)

The organisation named Clari5 provides solutions in the domain of Fraud Management in real-time intelligent based on big data analytics. The same gauges the complex fraud driven on the back of actionable insights. This plays an instrumental role in taking the right and suitable decisions in real time basis and helps in fraud detection and cost savings. The Clari5 has the capability to address the sophisticated issues facing the banking sector like timely detection of frauds, prevention, monitoring compliance and other regulatory requirements like auditing.

The Clari5 EFM system has been successfully applied in many global banks and has been instrumental in gauging many complex frauds at the wider scale. Moreover, the EFM system has reduced the false positives and reducing the cost of operations without compromising on the meeting the regulatory compliance and customers service delivery Figure 1.

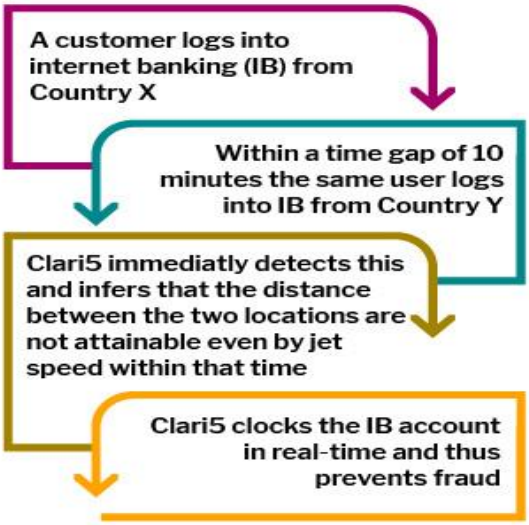

FIGURE 1
ONLINE FRAUD PREVENTION MODEL

Source: Clari5.com.

The ever-present issue of identity theft has been successfully addressed by Clari5 by providing foolproof mechanism against the threats emanating from Money Mules and ATO. It

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plays a decisive role in detecting the possible frauds before the online transaction is effected, thereby checks the loss pertaining to money and reputation. The same helped in bringing down the possible loss of money and reputation. It resulted into increase in the customers trust and leading to higher loyalty towards the concerned banking organisation.

Razorpay ThirdWatch (razorpay.com/thirdwatch/, 2021)

The Rozorpay is an advance Artificial Intelligence based solution offered by Thirdwatch in the domain of e-commerce. It plays a decisive role in securing the online merchants from Return to Origin (RTO).

Thirdwatch is an Artificial Intelligence-driven solution from Razorpay that helps the online sellers prevents Return to Origin (RTO) related losses by analysing the customers on a matrix having different parameters (more than 300). Accordingly, in cases where there is possibility of RTO, it raises alarm in real-time basis. This helps in preventing huge financial losses to the e-commerce merchants.

Moneta Money Bank and Mitra (mitrai.com, 2017)

The AI- driven solution company Mitra has unparalled capacities to effect the digital transformation at entries wide level, Web Services oxygenated (WSO2) platform. The Czech Republic based Moneta Money Bank (Moneta), has huge market presence with more than 10 lakh clients and over 200 braches alongside 650 ATMs. In 2017, the bank set itself to digitally transform its working and operations. The ambitious project was take up to make bank far more competitive in the market space. The chiefly goal behind such transformation included to increase the sale of online products by 40% and by 2020 to achieve pole position in digital market space.

Accordingly, the bank partnered with Mitra, which has got digital capabilities to undertake the transformation at such scale.

The WSO2 platform replaced the bank's earlier platform, which made the bank operations far more effective, efficient and simple in nature. It secured the information integrity and security, scaled up performance and innovation. This enhanced the customer experience with the bank and better satisfaction.

Mitra ensured rapid deployment, bringing down cost; thereby adding value to the entire project. The bank's present platform is operating on the principles of Continuous Integration and Continuous Delivery (CI/CD). This has resulted achievement of the bank's vision of better customer experience and customer retention.

AdvaRisk (advarisk.com, 2018)

The firm named AdvaRisk is Mumbai-based, specialised in Artificial Intelligence driven solutions for combating fraud in a proactive manner through proper and timely detection, and prevention. It also facilitates investigation and recovery of funds in corporate loan domain provided by the banking institutions.

Its AdvaSmart proprietary monitoring platform indicates the actionable credit negative transactions, which are associated with borrowers. This helps in gauging the frauds in a proactive manner, thereby preventing the possible financial and reputational risk.

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Another application AdvaNPA plays a critical role in optimizing fund recovery by stressing on undisclosed data and anonymous patterns. By leveraging on more than 600 data sources, the same has been connected to a defaulter. Resultantly, it helped in recovering more than Rs 20,000 crores recovery.

The AdvaRisk has deep capabilities in monitoring credit in an efficient and proactive manner. Accordingly, it is playing an instrumental role in gauging NPAs in a proactive manner and also, facilitates loans recovery, thereby addressing an existential threat to the whole of banking system.

Moreover, the firm also helps financial institutions through its services and enhancing underwriting measures and managing the loan portfolios in a proactive manner, thereby helps in early detection and possible instances of default and financial frauds.

Simility (simility.com, 2016)

It is a service provided by PayPal, which deals with fraud prevention based on its Artificial Intelligence driven prowess including Machine Learning. It has been instrumental in securing the interests of the customers and enhancing their banking experience. At core, it is an adaptive decision making platform, which is an omnichannel platform to prevent the frauds. Such capability is based on analysis and resultant insight developed on huge unstructured and structured data set.

Findings

From the above discussion, it is apparent that Artificial Intelligence based solutions primarily addresses three types of concerns of the banking system- fraud risk, reputational risk and cuts the cost in substantial manner. Moreover, it helps in trust building across the banking value chain and enhances overall banking experience, thereby achieving better service delivery and customer loyalty Table 1.

Table 1
SUMMARY OF ACHIEVEMENTS AND CORE COMPETENCIES OF ARTIFICIAL INTELLIGENCE DRIVEN ENTERPRISES

S.No.	AI Based Firm	Financial Achievement	Core Competency
1	Feedzai	- False Positives dipped by 42% - Cost Savings raised by 53% - New Account Approval raised by 74%	Real-time Risk Management
2	Ayasdi	- 3% enhancement in operational efficacy in the domain of KYCC (Know Your Customers Customer) - More than 20% fall in the instances of false positives	Anti-money Laundering Solution
3	Teradata	- Drop of 20% in the Fraud based false positives - Validation of customer identity with more than 95% accuracy - Detection of the synthetic account to the tune of 5%	Fraud Mitigation in Real-time
4	Clari5	- Application of Crime risk management technology	Enterprise Fraud

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		for identifying, gauging and controlling frauds - Instrumental in extending cross-channel and real-time facilities	Management Solution (Big Data Driven)
5	Razorpay ThirdWatch	- Brining down the instances of Return to Origin (RTO) - Instrumental in making Go or No-Go decisions in E-Commerce - Based on examination of more than 300 parameters, zero down on risky and potentially fraud orders in the fraction of second	Securing Online Transactions
6	Mitra	- Helping in digital transformation especially in the Banking space	WSO2 Systems Experts
7	AdvaRisk	- Based on more than 300 data sources, it raises fund recovery by emphasizing unrevealed data and anonymous patterns pertaining to a nonpayer - Recovery of more than Rs It has led to Rs 20,000+ crs recovery for banks and NBFCs - Checking forges	NPA Management
8	Simility	- leverage the power of artificial intelligence and machine learning to maintain security of customer data without compromising on customer experience - Gauges the accessibility of information of private nature	Adaptive Decisioning Platform
9	Trustcheck	- Correct identification establishment of the customers - Delivering optimal security by maintaining employment details, credit record, spending pattern, and purchasing history of the customers - Identifying and removing fake users	AI based technology software

Source: Developed from various sources.

According to Mckinsey Report (2020) "AI-Bank of the Future: Can Banks Meet the Artificial Intelligence Challenge" estimated that every year Artificial Intelligence driven technologies have potential to deliver up to $1 trillion of extra value. It is also found that an increasing number of banking firms are having a long-term vision when it comes to the application of the Artificial Intelligence driven technologies to scale up their business operation and cost savings, covering complete value chain and spectrum of activities Table 2.

Table 2
SUMMARY OF THE REPORT

S.No.	Particulars	Quantum
1	Enhancement in Value Delivery	USD 1 Trillion by 2030
2	Banking firms applied at least one Artificial Intelligence capability	60% of the respondents

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3	Most commonly implemented Artificial Intelligence driven solutions	Robotic Process Automation (36%) Conversational Interfaces (32%) ML Techniques (25%)

Source: Mckinsey Report (2020) "AI-Bank of the Future: Can Banks Meet the Artificial Intelligence Challenge".

The Artificial Intelligence driven solutions have capability to further scale up the existing revenues through customized services to the employees and customers. It is further predicted in the report that such advanced technologies would be instrumental in bringing down the errors, cost savings and improved operational efficiency and effectiveness. This would help the banking system to rise to the challenge and leverage on the future opportunities along with addressing the possible threats in the form of financial frauds and money laundering.

Therefore, based on the research findings, it is safe to conclude that Artificial Intelligence based technological interventions have decisive role in detection and prevention of financial frauds

CONCLUSION

Various studies have reflected that Artificial Intelligence driven solutions have become the necessities of the present digitalised scheme of things, especially in post pandemic times. The banking system has realised the capabilities and capacity of the Artificial Intelligence based technologies in the domain of fraud prevention, detection and mitigation. That to, it does all that on real time basis.

In the present scheme of digitalisation, the delivery of banking and financial services is squarely dependent on the efficacy of the cyber infrastructure. In order to secure the digital and virtual vitals, it is of utmost importance to protect the same against the criminal and disruptive elements. The role of Artificial Intelligence in this sense has turned out to be decisive one through various defense mechanism and to detect any malafied intent on the part of the hackers and anti-social forces.

The ever-evolving capabilities of Artificial Intelligence are being combined, reconstituted and re-formulated to extend unprecedented opportunities with new sets of challenges and threats. The anti-social and criminal elements have been found using Artificial Intelligence based tools and techniques to automate hacking attempts and other cyber scams, which are expected to rise and get instance with the passage of time.

According to leading global business information provider, in 2018 itself the Artificial Intelligence driven solutions in banking business was around USD 41.1 billion. This comprises of improvement over the previous banking processes and infrastructure, scaling up of operational efficiency and cutting down costs. By 2030, it is predicted that the Artificial Intelligence in banking sector would touch the mark of USD 300 billion.

AI based technologies have unparalled potency to predict possible risk and have a decisive impact on the risk assessment and overall performance of the banking system. The risks posed by the frauds and economic wrong-doings are not limited only to financial repercussions. The damage caused is not confined to just the direct monetary loss. The collateral damage includes harm to external business relationships, business reputation, stakeholders' optimism, status and reputation.

Not only does Artificial Intelligence based technologies helps in better risk management but also makes the business organisation far more efficient, effective in their operations and sustainable in their outlook. Artificial Intelligence has got integrate with the digital world we are

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living in. The banking institution need to come in terms with the opportunities and challenges thrown by digital realities. The survival and thriving of the banking institutions have become the function of how well they adapt and scale up to the emerging threats and opportunities. Such transformation is no more an option but a necessity on the part of the banks.

The need for a dynamic, adaptable, efficient and effective cyber defense system cannot be wished away by any sector let alone banking and financial services sector. However, these modern day technological interventions have substantial cost attached to them. Therefore, there is urgent need to ensure that cost-benefit equation favour the concerned organisation that is mooting the idea of adoption these technological solutions.

However, it is of utmost importance for the banking and financial sector to consider the cost-benefit tradeoff of investing in the Artificial Intelligence based solution not purely in economic terms but also other factors shall be taken into consideration like moral hazard, reputation, status etc. before reaching to a conclusion. Various studies have shown that the return of investment on such advanced technologies has been many folds over in terms of financial and non-financial returns, along with many spillover positive effects.

The bone of contention still remains to be the government emphasis on financial inclusion and digitalisation spree on the one hand, while on the other hand there is a lack of basic literacy let alone financial literacy. This can be disastrous as it can easily turn out to be a perfect recipe for financial frauds and economic crimes.

It can ultimately lead to humongous loss to the people, especially the illiterate and poor ones, in terms of trust deficit and ensuing moral hazard. The Reserve Bank of India (RBI) reported that the total fraud bank fraud case in 2020 is approximately 8700 (statista.com, 2021). Therefore, a delicate balance need to be stuck between the need to embrace the technological advancement and securing the stakeholders interest.

The costs may seem on the higher side for small organizations, substantial cost savings from reduced fraud losses may also be significant apart from many other spill-over positive impacts in terms of building higher level of trust among the stakeholders, improved status and enhanced reputation.

Therefore, as in the case of any other technological advancement, Artificial Intelligence is also, neutral in its application in terms its usage as a tool to guard the business and operational vitals, and on the other hand, it is equally vulnerable to be used by criminal elements to mount cyber-attacks and facilitate frauds in an unprecedented manner.

Finally, if Artificial Intelligence has got decisive edge in handling simple, monotonous tasks and automated jobs. However, there is no match to human intervention in the domain of customized solutions, personalized and emotional connect. Therefore, a proper blending of the prowess of Artificial Intelligence with human touch, in order to deliver better customer experience and guard the business from possible threats.

To conclude, it is felt that there is a strong need of studies to assess the economic effect of the operationalization of the Artificial Intelligence based solutions in the range of the business units in order to gauge the efficacy of the Artificial Intelligence and to have ample data set to undertake evidence based cost-benefit analysis in a holistic manner.

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All the authors have significantly contributed to the development and the writing of this article**.**

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