

The impact of Artificial Intelligence (AI) in detecting fraud in the UAE

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Abstract

Artificial Intelligence (AI) technology has revolutionised the way businesses function and enables decision making to remain sustainable in the contemporary global markets. In the context of the UAE, the utilisation of AI technology is prevalent, especially in the healthcare sector. UAE became the first nation in the world to have appointed a minister for Artificial Intelligence in October 2017. The widespread benefits of AI-based technology have also made its marks prominent in the banking sector and particularly in the detection and prediction of fraudulent activities. However, a review of the background research in this context revealed that the availability of empirical evidence and research studies conducted to explore the impact and implications of AI-based technology in fraud detection in the UAE banking sector is scanty. Therefore, this study will be guided by the purpose of exploring the impact of AI technology in fraud detection in UAE banks to deduce answers to relevant research questions. Therefore, a descriptive research design has been adopted to conduct a study based on the collection of quantitative and qualitative data from a sample of 200 employees of the UAE banking sector engaged in the fraud detection departments recruited using simple random sampling and 10 data scientists from the same sector recruited for the collection of qualitative data. Using a deductive approach, the data will be analysed to deduce the findings of the research.

1.0 Introduction

Artificial intelligence would be termed as the evolving technological applications by many people since the era when "sliced bread" was invented. In the medical field, AI assists the doctor to determine the health status of particular patients referred. Despite the variations provided no one can deny the effect of AI in our daily lives. We have several examples in our daily life such as SIRI, ALEXA and CORTANA (Canbek and Mutlu, 2016). Games like virtual personal assistants, "middle earth" "shadow of murder" smart cars have all integrated AI effect in them.

What is artificial intelligence?

It is a term used for simulated intelligence in machines which, if explained properly then machines can be programmed to behave like humans. Its emphasis is on the creation of manly machines that work and respond like humans with the ability to rationalize and take actions with the best possibilities to chase a goal. These machines can do activities like speech recognition, planning, learning, analysing and problem-solving (Nilsson, 2014).

Fundamental benefits/implications of AI technology

1. Error reduction: AI enhances the accuracy level to the provided data and information hence reduces the chances of errors and mistakes.
2. Difficult exploration: AI combined with the science of robotics can overcome different obstacles faced by human beings and could be used in difficult explorations such as mining and for exploring areas like mines and the ocean floor.
3. Everyday use: machines like ALEXA, CORTANA in providing personal assistants, self-driving cars for a long journey, the smart chef to make food (Canbek and Mutlu, 2016).
4. Machine's intelligence can be employed to perform risky activities so reducing life-threatening factors. This kind of machines also does monotonous tasks.

Bad impacts/ risk factors

1. Unlike human beings, AI cannot improve with experience rendering a limitation to its effectiveness. AI process data cannot be asked to behave according to the changing environment similar to human intelligence.
2. There is also a controversy against the replicating of human intelligence. Advocates of this argument state that since these machines do not hold the mechanism of invaded emotions, they are incapable of distinguishing between right & wrong. They often cannot perform in situations that are unknown to their system updates.
3. A genuine prediction states that these machines being so highly developed in future can surpass and take off on their own redesigning themselves at an exponential rate. Every individual substance along with individual have its merit and demerits. PwC predicted that by 2030 AI could boost global GDP by 14% which is equivalent to \$15.7tn. The fields of finance and healthcare are the most benefited from AI.

In October 2017, UAE appointed His Excellency Omar Bin Sultan AI Olama as the first minister of state for AI, making UAE the first country in the world to have a designated Minister for AI. This expressed the UAE's ambition and resolution to play a central role in the global technology's revolution (Galeon, 2019). Recent reports stated that UAE is predicted to have a boost of \$182 billion added to its economy by 2035 (Gulfnews.com, 2019).

AI usage in the financial sector

Online financial transactions are in boom and so are frauds. Fraud detection and prevention has become easier through machine learning. A huge amount of data can be fed to capable machines enabling them to track suspicious behaviour against records and flag such activities. Instead of relying on humans when the function of error detection is provided to machines it more efficient searches and finds all the errors and defaults. However, the flip side to this sometimes machines also come up with false possibilities that could harm genuine customers and also the reputation of genuine transactions (Perols, 2011).

Avoiding fraudulent activities & money laundering has been a specific challenge for different financial institution. For quick identification, AI engineers have developed various tools and system to enhance fraud detection. Robust and rapid processing based on the advent of mobile technology, data availability and open source software offers AI a huge scope in the

banking sector. Digital personal assistants and Chatbot have revolutionized the customer service and business communications in the contemporary situation. After gathering the data from users, AI-based mobile applications process the data through machine learning to provide the relevant interpretation. The advent of AI not only enhances customer satisfaction, but the workload has also been reduced and accumulated processed data is easily accessible (Forbes.com, 2019).

Although it may be considered that AI and machine learning technology are still in their infancy, yet implementation of these technologies has resulted in a huge reduction of fraudulent activities. AI technology is deemed to evolve in multifaceted dimensions in the coming decades to bring promising security and refinement in fraud detections and prevention.

1.1 Research problem

One of the most important challenges that banking organisations face is the management and mitigation of fraudulent activities in the organisation. In this context, AI-enabled technology has significant beneficial implications in early detection and prediction of frauds using solutions based on predictive analytics, machine learning and anomaly detection. However, review of the research background indicated a significant research gap in terms of the availability of research focusing on exploring the impact and implications of AI technology in fraud detection in the UAE banking sector leading to the necessity of this research.

1.2 Research questions

- What is the impact of AI on fraud detection in the banking sector of the UAE?
- What specific challenges and limitations are hindering the adoption of AI in fraud detection for the UAE banking sector?
- In what ways can the fraud detection function of the UAE banking sector be enhanced through the use of modern AI technology?

2.0 Study background

Role of Artificial intelligence on fraud detection within the banking sector of the UAE

In the era of technological revolution, AI technology has emerged as a forefront cutting edge revolution in the worldwide context. AI technology in the 21st century finds relevance in multiple dimensions of life, developing unprecedented pace through greater acceptance as a new technological innovation. This technology has the potential to transform operations in the banking industry. The technology has received enthusiasm based on the capability of simulating human decision making while avoiding man-made errors. The case of AI implemented in the banking sector of UAE has gained acceptance in terms of the benefits for fraud solution based on machine learning. The solutions integrate AI technology to detect fraud in more than one type of transaction and both are enabled at the same time. Majority of UAE banks has been the consumers of AI artefact development firms selling commercial fraud detection solutions. These AI-based solutions enhance fraud detection by impacting data analytics software to recognize the potential of fraud cases while avoiding acceptable deviations from the standards.

The implications of AI-based technology and applications in the banking sector finds critical relevance to the area of fraud detection and mitigation of factors leading to fraudulent activities. One such application is found in the context of anomaly detection which finds application in the banking sector related to the identification of fraudulent transactions. AI-enabled systems can identify frauds and score transactions based on a predetermined risk scale influenced by customer data. This area of application of AI technology is relevant to predictive analytics. Furthermore, using AI-based systems, a range of banking operational areas can be assessed for fraudulent activities such as loan frauds, payment frauds and customer acquisition frauds. Furthermore, critical consideration of the data required for the detection of fraudulent activities through the implementation of AI-based technology in the banking sector is important to be focused on AI implications such as machine learning, anomaly detection and prediction and the use of predictive analytics for the identification of fraudulent activities across a range of banking operation channels.

Machine learning

Machine learning has critical implications in the detection of fraudulent activities in the banking sector through the instrumentation of the technology across multiple data channels for analysis and interpretation of data. As such, the long-term implication of machine

learning in fraud detection is based on the programming of the instruments to identify fraudulent activities for multiple transaction areas and applications. Effective adoption of machine learning, therefore, demands the skills and expertise of data scientists for the implementation of AI-based technology solutions for fraud detection through machine learning. The expertise of the data scientists is crucial to enable their understanding of how the AI-based decisions are made and if necessary, override the decisions of the AI. Commercially available AI-based fraud detection and mitigation solutions such as Teradata emphasizes the importance of fraud detection through establishing certain levels of tolerance to the deviation from standard norms (Mejia, 2019).

Anomaly detection

This is one of the most popularly implemented AI-based fraud detection technology solutions in the banking sector. Anomaly detection solutions are beneficial based on the fact that they are simpler than predictive analytics. Furthermore, such applications are influenced by basic machine learning models that are further influenced by the consistent and continuous availability of data. Furthermore, the fraud detection modules in this type of technology are also programmed to accept specific levels of baseline normalcy in the areas of banking transactions, loan applications or the data required for the opening of a new account with the bank. These systems also come with integrated alarming and reporting systems that alert the human elements of the banking organisation regarding variations from accepted standards of baseline normalcy. Simultaneously, these detected deviations also activate the integrated machine learning models to determine fraudulent activities in transactions, application or customer information (Choi and Lee, 2018).

Predictive analytics

Predictive analytics as a fraud detection application of AI-based technology in the banking sector is related to the machine learning models based on which the predictive analytic software programs can be developed for the specific purpose of predicting potentially fraudulent activities in the banking sector. It is based primarily on the capability of the algorithms to rate specific fraudulent transactions on a pre-established scale for fraud risks. The similar database is required for the functioning of both predictive and prescriptive analytics in the banking sector (Miltonberger, 2010).

3.0 Methodology

In light of the purpose of this study guided by the research questions, the selection of a systematic methodology is crucial for answering the research questions. This requires the collection of primary and secondary data in both of the data types of quantitative and qualitative data. The study will be based on a descriptive research design which will aid in the determination and explanation of the impact and challenges of AI interventions in fraud detection in the UAE banking sector. The collection of data will be underpinned by a mixed approach to enable the collection of both quantitative and qualitative data. Furthermore, using a deductive approach, the collected data will be analysed. Since the determination of a sample size that can accurately represent all the available characteristics of the chosen population is imperative, this study will utilise the simple random sampling for the recruitment of 200 employees of the UAE banking sector involved in the fraud detection departments of the banking sector. Furthermore, for the collection of qualitative data, using non-random sampling, 10 data scientists of the UAE banking sector will be recruited. Based on the deductive approach, quantitative data will be statistically analysed while qualitative data will be analysed descriptively.

Results

What is the impact of AI on fraud detection in the banking sector of the UAE

In the banking sector of UAE, artificial intelligence is one of the fastest evolving technology which has been widely used for providing the customer's next-generation services. This technology has been adopted by the UAE banking sector for developing economics and technological innovation. The AI is much more helpful in the area of fraud detection in the banking sector in the UAE. Fraud detection is applied in the banking sector for the identification of false pretences. This fraud detection is separated by the use of artificial intelligence including the analysis techniques like calculating statistical parameters, regression analysis, probability distributions and models and data matching. Some of the most popular fraud types in the banking sector are the use of false identities, money laundering, credit card fraud and mobile fraud. In this context, the use of AI technology in the banking and financial sector stands as a global trend. In any financial company or bank, fraud is a very important risk which facing particular prevention techniques such as PINs, passwords and identification systems all those are creating pressure in the modern banking sector. Regarding the modern technology use of credit cards is a very fashionable tool of fraud. For the fight against this type of fraud data mining plays a very important role which has a bunch of techniques for extracting related information from a large amount of data for assisting in decision making. If the fraud is detected in about the distribution network then the system schedules follow up and field investigation investigates to fix the fraud systems or techniques for online fraud detection having been implemented by artificial intelligence technology. Artificial intelligence plays a very important role in the development of financial life in modern society. It also encourages banks by providing financial assistance for the growth of the big industry. In the current situation, AI is considered as the lifeblood of today's world economy because of the handling cash, credits and other financial transaction benefits. Using by the AI, banks can help the customer for tracking their savings and expenditure then motivate them to save money and earn some interest in their future. By using artificial intelligence, it was only possible in the banking sector to create smoother operations through computers and networks. Fraud is one of the intriguing risks for customers, especially in the banking sector. The good thing is noticed in that time in UAE if

the fraud transaction noticed in any bank then quickly the bank authorities take actions in a very organized manner and all of this is possible by the bank authorities because of the use of artificial intelligence for early detection. In the modern technological context, artificial intelligence can detect and minimize banking fraud. These techniques enhance the banking fraud also by scanning through the vast transactional data and make it modernised day today. The UAE banks can detect fraud by protecting the security breaches. Government of UAE appreciated this modern technology because it helps to ensure good economic strength in the UAE banking sector by building the trust of the bank customers and similarly bank by sustaining the loyal customers. As per fraud detection in the banking sector, AI can make a good impact as well as the demand of the situation.

What specific challenges and limitations are hindering the adoption of AI in fraud detection for the UAE banking sector?

The following challenges and the limitations that are hindering for the adoption of the Artificial Intelligence (AI) in the fraud detection of the UAE banking sector has been assessed in the research question as Artificial Intelligence (AI) is the part of the human intelligence processes by the machines and AI implement with several challenge factors it is computing which is not that advanced, as it provides fewer people support, creating trust, tracking one's mind, probability, data privacy and the security, algorithm bias and the data scarcity. As the digital transformation is redefining the banking sector of the UAE, whereas such banking sector is adopting artificial intelligence and some other kind of disruptive technology in it to create an impression and value for their tech-savvy customers. Thus, the process of adoption of artificial intelligence in the banking sector of the UAE which leads to enable to deliver a seamless experience whereas the expectations are high and the challenges that are implemented in the banking sector of the UAE are higher. As there are some fundamental challenges and limitations are hindering in the adoption of artificial intelligence when it comes to the banking sector which is often missed because of the other distraction. Thus banking sector is the unique institution that emotes the trust which enables the savers to surplus the money to earn revenue in order to lending those where the need of money is required through the banking sector of the UAE, which carries the ability to discover and evaluate the borrowers and has the ability to recover the loan in which the individuals savers

cannot do by their own. Artificial Intelligence based on the past transaction of the customer develops a better on customer behaviour and their experience. The challenges and the limitation in the banking sector reveal that the most processes in the banking sector of UAE are rule-based whereas artificial intelligence is serving into most of the processes in the bank where a very low level of intelligence are required and which are having high volume, and it is resulting not only in the lower cost but also it requires more accuracy and quicker services when that are handled by the humans. By using the algorithms, artificial intelligence is being deployed with great success in customer service, reputation management, risk assessment and fraud detection, etc. The challenges to providing 15 to 25-year tenure loans for the infrastructure that lies in the absence of loan term sources for the capital or the liability products of the banks. As there are numerous artificial applications are being used to make their way to the larger bank of the UAE and the concern fraud is a major part of the banking sector of UAE. The use of the anomaly detection is a part of artificial intelligence approach which will particularly help banks to identify the fraudulent transactions and the transfer of the customer, thus a banking sector faces a big challenges in the fraudulent and with the help of the predictive analytics the banking sector of the UAE could detect both like the fraud and the score transaction by the risk level that is based on the wider range of the customer data in the UAE banking sector. Some challenges in adopting the artificial intelligence in the banking sector of the UAE which may leads to employ detecting the payment fraud, loan fraud, and the customer on boarding fraud and the limitation that has been discuss in this analysis which required in the detection process such as an overview of the machine learning for the fraud detection in the banking sector of the UAE as well anomaly detection for the recognizing of the inconsistencies or the inaccuracies in the payment and the application information and the predictive analytics that has been used for the solution for detecting the fraud activities across the multiple banking channels in the banking sector of the UAE is one of the big challenges as well the bank used the strategy of machine leaning fraud detection in the banking sector of the UAE which is the process of the artificial intelligence where bank could get benefit from the machine where it could able to instrument it across more than one channel of the data to be analysed which could mean that the model could be trained in order to detect the fraud within more than one type of transaction or the application which can be analysed both at the same time which is the limitation for the banking sector of UAE.

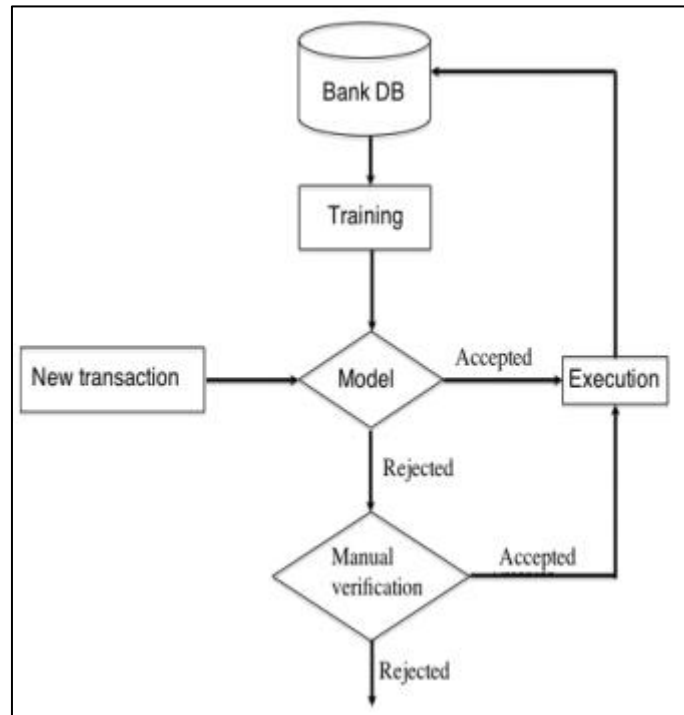
Whereas importantly a data scientist is essentially recruited and a team to justify the analysis for the bank which creates staffing challenges. The business and the banking sector who were adopting the artificial intelligence which is not subjected to the obligation of the explanation of how they use algorithms that arrived at a particular decision or the conclusion which they are tended in the indifferent on the following count. As it has been observed that the cybercriminals are getting smarter in a day to day basis that is the reason that banking sector of the UAE have no option to tighten their defence position and develop their capabilities in a faster procedure by the adoption of the artificial intelligence such as big challenges that are faced by the banking sector according to the report of the MacAfee which is an anti-virus, anti-threat software-based organization estimates that the cybercrimes which lead to the financial fraud which is component and the total cost that has been estimated around \$600 billion equating to the 0.8 per cent to the overall of the global GDP. Credit card fraud in the banking sector is the most common types of cybercrimes in the banking sector and the growth of the e-commerce business and the mobile payments which are the latest track of the card payments in the recent years and the scale of the problem is vast. Thus, the banking sector of the UAE faces such kind of challenges to secure the customer transaction security thus then required to adapt the artificial challenges in the banking sector. As the people in today's world experience the methods of the online payment which are powered by the unique tools from the payment gateway of the bank to the fraud detection services and checkout its tools and in the e-commerce segments where the businesses layer on its following suites of using different types of tools in order to creates fraud detection stacks. Thus credit card fraud which is a massive problem for the eCommerce retailers thus when the credit card got stolen off the customer at that point of time the original owner of the card will directly call up the bank in order to reverse their transaction it also initiated a chargeback but it is an important task or challenges for the banking sector of the UAE. As the banks need to carefully deal with many origins such as black markets of the stolen cards, card numbers which are obtained during a major hack operation, sophisticated credit card rings as well the petty thieves and more that is the only reasons that banking sector of the UAE set up certain limitation so that the fraud does not occur in their bank which is their most crucial challenges part thus they adopt artificial intelligence in their bank to irrupt such occurrence.

In what ways can the fraud detection function of the UAE banking sector be enhanced through the use of modern AI technology?

AI is presently applied in data mining, voice recognition, and pattern recognition, market analysis investment strategies and also in IT system development to curtail down errors and mistakes hence work efficiently by getting used to settlements and regulations and infrastructural changes. The financial institutions such as banks and lending institutions need to recognise the areas which require to implement proper steps to design the path for AI adoption in the dynamic business environment. Fraud detection is a crucial part to reduce frauds and scams in the banking industry. After the utilisation of AI in fraud detection especially in a situation like uses of unauthorized mobile transactions conducted by devices and also in platforms by the utilisation of virtual identity theft which increases the tendency of fraud activities. Fraud activities with the utilisation of credit cards or cash cards, frauds claim against insurance policies or unauthorized transactions and fraud money transfer initiated through stolen identity. In such cases, AI has reached such a level that they can easily detect fraudulent transactions. The causes beneath algorithm perform the analysis which is done considering historical data to create a relevant sophisticated model that will help in figuring out or prior detection. Combined data is input to the multi-layer neural network which forms predictive models which contain the capacity of generating patterns and sets of such meticulous level which is feasible due to deep knowledge about learning designs and algorithms. Hence such arrangements to a greater extent will be a useful aid to fraud detections in the financial industry as they are holding the trust-worthy mechanism in the form of dependable forecast and estimation tools.

Banks have always been the prior adopters of any technological change in the market. AI predictions and technology are universal. The landscape in financial sectors noticed a vigorous changed rapidly with digitalization; with the advent of universal connectivity and seamless user experience. The use of AI is the best way to recognise resourceful fraudsters. AI learning algorithms process a large amount of data to analyse and find out unique patterns or anomalies that may find a loop to hide in traditional methods regarding error detections. Hence the UAE banking sector can be enhanced through the implication of modern AI technology. To seek early detections of frauds the data accumulated within the bank as

information are used. After analysing that the different kinds of bank frauds that are present such as credit card, money laundering or mortgage which are present at present the banks in UAE have used the support vector machine and fraud detection systems to deal with the circumstances.



According to the fraud detection system mentioned above the system takes the database that has been gathered in the banks and then carries out a learning procedure for extracting a model mentioning the rules and, functions which demonstrate the features of the data. The model can be implemented to resolve the new transactions, the transaction that is accepted by the model is then executed further and then attached to the database to modify the model. Transactions that are not accepted by the model can further be manually checked to check its genuineness. After the manual check, if it is found normal then only it is summed up in the data compilation whereas if rejected then the transaction is also stopped. This was a lengthy process though; moreover, detecting frauds through the analysis of the behaviour of the fraudsters is next to impossible keeping in pace the rapid change and development of the technologies. According to different reviews, there are two recognised forms of automatic learning mainly the supervised and unsupervised models. Supervised models take into consideration the prior knowledge possessed such as nature of transactions, fraudulent. The

learning, in this case, prepares to make a separate area into two sections according to the availability of examples then allocate new examples which are related to the membership to one or numeral classes. Sequence alignments or neural network are all unsupervised methods which do not need any early classification of training samples whereas it is based on strange transactions. Hence hybridizing the two types of learning to reinforce them. The supervised transaction helps in the process of detecting frauds transactions whereas unsupervised transactions ought to locate the strange transaction which happens at the same time and also referring the transactions, strange data. Avoidance of false generalization in implementation of binary learning by filtering the positive part through single class learning. The sane and fraudulent transaction is eliminated with the help of hybridization. The support vector machines resolve the problem of separations of individual classes. This technique is useful for finding out the outliers with the help of SVM (Abdelhamid O., 2014). To notice the regulatory compliances in a banking sector which it huge scale it is not possible to manual monitoring considering the huge numerals of transactions. The global recession of 2008 faced a different crisis which was initiated to overcome implementing different measures. Hence to overcome the challenge there were requirements to report large exposures, collateral or capital levels which required reporting in many folds. To cope up with the situations most of the bank initiated Artificial intelligence systems to manage all sorts of operations such as anti-money laundering programmes etc.

Furthermore, using AI intelligence rather than just fraud detection many other issues are correlated removed. Anomaly detection is one of the prominent approaches of automation intelligence that helps banks identifying and rescuing all frauds. Predictive analytics solutions for detecting fraud across multiple banking channels. Moreover, with the development of technologies data, analytical software identifies possible fraud cases while avoiding tolerable deviations from the norms. Whereas in any other cases its end up as a false positivity that offers the systems a learning session to learn from the mistakes. The predictive analysis reduces the risk factors of fraud with the help of pre-trained analytics. Henceforth AI technology has a wider scope of the implementation in all financial institution and has a promising future in respect of fraud detection which in return will reduce the scams and frauds in respect of money laundering, mortgage others (Mejia, N. 2019).

Conclusion

As the following study focuses on the Artificial Intelligence adoption in the banking sector of the UAE thus artificial intelligence is the competitiveness strengthening of the banking sector of the UAE thus it helps to enhance the experience of the customer which is based on the past transaction of the customers as well artificial intelligence develops the overall understanding of the customer and their behaviour which helps the banking sector of the UAE to identify any kind of fraud. It also detects anti-money laundering patterns and makes the customer to the recommendation. The banking sector uses the artificial intelligence tools in the findings of the technology which leads to overcoming the traditional customer service challenges as well it also aids in lending the decisions which are the regulatory compliance which is always on the Chatbot sidesteps in the banking hours. Artificial intelligence aids in the regulatory compliance and it helps to improve the decision-making within the basis of loans and the credit. The following study elucidates the fundamental benefits and the implications of adopting the artificial intelligence in the banking sector of the UAE and thus it also carries with the preventions of the bad impacts and the risk factors that the banking sector of the UAE carries in their businesses. It implemented the usage of the artificial intelligence in the financial sector where it has been noticed that the online financial transactions are in boom and so are fraud and the fraud detection and its prevention become easier through the online machine learning where a huge amount of data can be analysed or fed through the machine learning tools and the machines are enough capable to track the suspicious behaviour against the records and flag the suspicious activities. It has been noticed that one of the most important challenges that the banking organization face is the management and the mitigation of the fraudulent activities within the organization. Thus, some research question has been generalized in the following study to analyse the report based on the research analyse. The role of the artificial intelligence on the fraud detection within the banking sector of the UAE as the artificial technology has emerged as a forefront cutting edge revolution in the worldwide context and also artificial intelligence which is in the 21st century find relevance in multiple dimensions of life, developing unprecedented pace through the greater acceptance as new technology innovation. Using of the machine learning tools of the artificial intelligence has been evaluated that it carries critical implications in the detection of fraudulent activities in the banking sector through the instrumentation of the technology across the multiple data

channels for analysis and interpretation of data. Use of the Anomaly detection of the artificial detection which is the most popularly implemented based on the fraud detection technology solution in the banking sector and the predictive analytics as a fraud detection application which is based on the artificial intelligence technology in the banking sector which is related to the machine learning models based on which the predictive analytic software programs that can be developed for the specific purpose of predicting potential fraudulent activities in the banking sector. Research methodology has been suppressed which provides a light in the purpose of the study which is guided by the research questions. The following research question has been answered and all the depending benefits of adopting the artificial intelligence in the banking sector of UAE.

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