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Revolutionizing Healthcare with AI: New Trends in Oncology, Chatgpt, Oil and Gas Scams, and Information Technology Security

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Abstract

Artificial intelligence (AI) is today rapidly revolutionizing businesses around the world by providing exceptional opportunities in areas like healthcare, petroleum fraudulent activities, and cybercrime. AI is progressing in healthcare; it is reshaping cancer diagnosis and therapy by early diagnosis and offering the right treatment tailored toddle and the patient genetics in order to enhance patients' lives and their prognosis. Thus, the uniqueness of its approach in handling massive volumes of medical information has produced impressive advancements in the areas of diagnostics, pharmaceuticals and therapies. AI has become indispensable in the petroleum industry in areas such as; fraud identification and prevention, analysis of transaction data, inventory and environmental reporting to minimize cost and legal infringement. AI integration contributes positively to midlife promising technologies such as block chain, especially by improving the transparency and security, especially where there is tendency of manipulating prices and other fraudulent deeds. In cybersecurity, artificial intelligence is enhancing the fortification measures meaning real-time threat identification & protection, resource vulnerability management, and anticipation and prevention of equipment failure for protection of pivotal structures from cyber threats. Businesses are being revolutionized by ChatGPT's AI, which increases automation, improves decision-making, and streamlines communication. In cancer, it facilitates the study of medical data for treatment planning, while in healthcare, it supports diagnostic procedures and patient involvement. AI is slowly but surely approaching the mainstream in a number of industries, where it increasingly serves as an effective means of increasing operational effectiveness, security, and credibility. Some of the outstanding issues include; quality of data to feed these models, integration issues, and need for specialists, but the future of AI holds more intelligent, adaptive, and secure systems making it a key enabler across economic sectors. This article focuses on the puritanical uses of the AI and on how this technology could change many sectors for the best while creating more opportunities for growth and optimization.

Key words: *AI, medicine, oncology, fraud, petroleum, security, learning, deep learning, analytics, block chain, anomaly, biopharma, drug, therapy, security protection, predict and prevent maintenance, transparency,Chatgpt, data, work.*

Introduction

Machine intelligence or the commonly referred as artificial intelligence (AI) has advanced tremendously in the last few decades or so from being just concepts to real applications in the business world. Of these, healthcare, the detection of petroleum fraud, and cybersecurity deserve to be highlighted as spheres in which AI is now making revolutionary transformations, thereby introducing new opportunities in response to the existing problems. In addition to improving the functioning of these domains, the application of AI effectively made it possible to introduce previously unachievable developments in the sphere of diagnostics, fraud prevention, and security [1]. This introduction will provide brief thoughts on how AI has shifted these fields as well as the opportunity, applicability, and possibility. Intelligence especially Artificial Intelligence means the capability of machines to represent and /or mimic human intelligence as exemplified by its capacity to engage in thinking, learning, perceiving, decision making, and

understanding. Of the many branches of AI, two major ones that are much used in analytics, specifically in analyzing big data and coming up with predictive patterns or recommendations for a particular course of action are machine learning (ML) and deep learning (DL). Given that more and more industries produce significant amounts of data, AI supplies the processing and analysis capacities needed for data management [2]. Diagnostic application of ANI is increasing the reliability and time for diagnosis of different diseases and conditions such as radiology, oncology, pathology and many more where human mistake often leads to disaster [3].

AI in ChatGPT is transforming businesses by increasing automation, boosting decision-making, and streamlining communication. In healthcare, it aids diagnostic processes and patient engagement, whereas in oncology, it aids in the analysis of medical data for treatment planning. In the petroleum sector, artificial intelligence aids in the optimization of operations and the prediction of equipment breakdown. ChatGPT also plays an important part in fraud detection by studying trends and finding abnormalities. In cybersecurity, it improves with threat detection and response automation [4]. ChatGPT's superior natural language processing capabilities make it a flexible AI tool, revolutionizing numerous industries and fostering innovation.However, it is becoming personal through genetic data analysis to determine an individual patient's treatment plan. The enormous amount of data gathered from sensors, machinery, and even financial transactions can be fed into an AI system which can then easily detect what might be deemed as suspicious by human operatives who would otherwise be hard pressed to do the same. AI application toward prevention of petroleum fraud is beneficial not only bearing a positive impact on company's financial in terms of saving potential loss, but also improving compliance in accordance with legal requirements where the government enforces more transparency in the industry [5].

Oncology molecular market

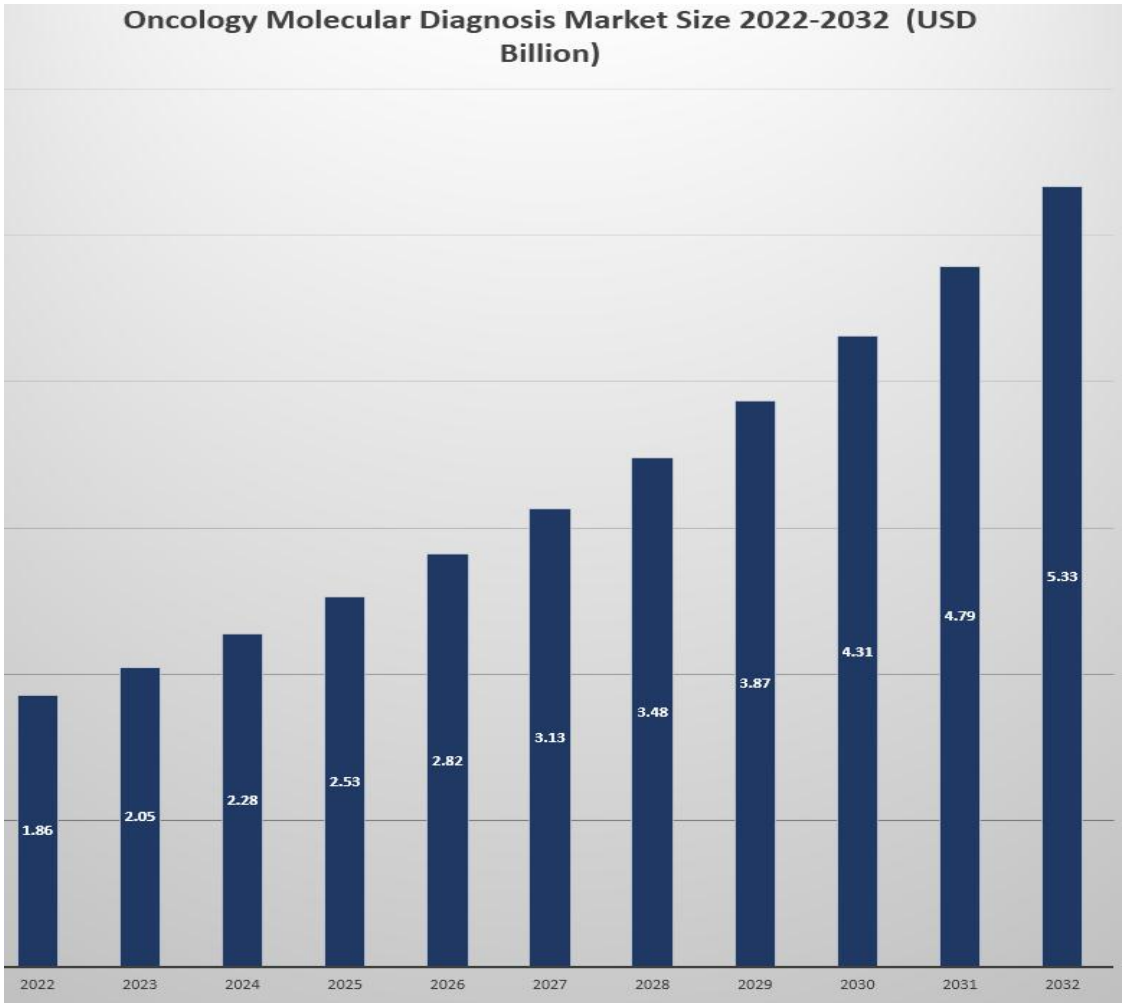

Figure: 1 showing oncology molecular diagnosis market

AI in Cancer Medicine: Introductions of Novel Reforms and Innovations

Cancer continues to be one of the leading life threatening diseases to this date; with new cases of the disease being reported every other day in different parts of the world. Thus, despite the appearance of potentially effective treatments and early diagnosis, cancer still remains one of the leading killer diseases, and many types of cancer are still poorly amenable to treatment [6]. Nevertheless, in the last decade impressing progress has been noted as applying Artificial Intelligence (AI) introduced fundamental changes to cancer medicine in terms of early diagnosis, tailored therapy, and even chemotherapy. Rodger Stein AI is rapidly changing the experience of cancer by increasing diagnostic reliability and optimizing methods of treatment and cancer control [7].

Another prospective use of AI in cancer medicine is in the identification of cancer and its precursor condition. Evaluating what breast cancer screening services are currently available is keener to enhance survival rates because cancers diagnosed in their early stages are easier to manage. Biopsy and imaging diagnosis require considerable time and may be prone to human factors sometimes. Machine learning as a subset of artificial intelligence is finding its way into the analysis of medical images like CT scan, MRI, and mammograms to detect abnormal cell growth, which may signify cancers. For instance, AI has displayed an ability to identify primary breast carcinoma, primary lung carcinoma, and primary skin carcinoma. Generative models learnt from large repositories of medical images can discover features potentially unnoticed by a radiologist, allowing for more accurate, earlier and therefore better treatment [8]. Furthermore, the presented AI systems can also help pathologists to analyze biopsy samples, to improve the identification of cancerous tissues. AI is already a critical element of individualized cancer care and is being used in decision-making for assigning treatment regimens as per the geo-genomic details of patient as well as tumor. Genomics, where practitioners choose treatments that are appropriate to the genetics of the cancer sufferer is now considered to be one of the defining characteristics of oncology. AI is capable of studying vast amount of genetic and molecular data of the cancer patients and thus using such data to find out which treatment type would be most effective for a given patient. This approach is especially important in cancer types like the breast, lung, colon, and rectal cancer, among others because the efficiency of specific treatments depends on certain genetic changes within the body. AI systems also can assist the oncologists to track the patients' reactions to the treatment in real-time manner and conceptualize the nature, development and possible need for intervention of the cancer [9].

AI has also demonstrated god potential in drug discovery as well as the development of treatments to cancer. The process of coming up with new cancer treatments usually takes years, costs a lot, and mostly there is a lot of guess work involved. But it is doing it much faster through key technologies of analyzing giant data sets, trial data, such as clinical trial results genetic information, and interactions between drugs. Machine learning techniques can also suggest which compounds could be used to treat specific cancer mutations, significantly faster than usual approaches [10]. Also, the effective use of AI can be helpful for prediction of these drugs on the human body leaving lesser need for preclinical animal tests and accelerating the drug development processes. AI techniques have not only accelerated the process of drug discovery but have also presented an opportunity of identification of novel therapeutic application for active pharmaceutical ingredients, a process known as drug repositioning, which may prove beneficial to cancer patients much earlier than discovery of new active pharmaceutical ingredients. Automated robotics are also being witnessed in treatment of cancer, especially in robotic surgery. Some of the most complicated cancer surgeries are now performed using robotic systems on which AI is inbuilt. Such systems enable fine sub-millimeter motion essential in procedures such as those on the head or in the area of vital organs. Robotic surgery augments the surgical maneuvers in difficult anatomy, provides precise control, and reduces human imperfection to enhance patients' recovery, fewer complications, and better results [11].

Further, AI is also being applied to improve radiation therapy which is one of the principal techniques of treatment of cancer. In radiation treatment, AI systems are capable of properly adjusting the doses and making sure that the deadly tumor receives the right dosage, but the healthy tissues around it are exposed to as little radiation as possible. Now, let's see how this works: AI is able to analyze data from patients' images to generate radiation therapy plans that will be as effective as possible but at the same time contain only the smallest amount of adverse effects as it's possible [12]. Thus, it was identified that there are benefits of the application of AI in cancer medicine; however, there are challenges of implementing AI in clinical practice. Privacy issues, requirement of big and rich data sets and data bias are some of decisive issues. Moreover, related persons including healthcare professionals should be trained for further using such systems and for correctly interpreting results that are produced by AI.

However, it is quite clear that the future of the AI in cancer medicine remains very promising. Precision oncology, drug discovery tool, early detection and personalized treatment from AI are likely to grow up more in the future as it enhances day by day. Scholars are actively seeking better and better AI techniques that could help with the forecast of cancer development, identification of brand new treatment marks, and the provision of more individualized approaches to patients. AI holds the key to taking us to a place where; not only is cancer manageable but possibly eradicated outright with the chance of renewed lives for millions of patients all

over the world. Computing technology is revolutionizing cancer medicine at its core by offering novel solutions to prevention, diagnosis, therapy, new drug discovery, and surgery. The steady enhancement of tools within AI reveals the potential to enhance survival, lower the cost of the remedy, and drastically shift the future for many cancer patients. AI is becoming more significant in cancer diagnoses and treatments every day, and the progress has been realized to be useful in making the diagnoses and the treatments more efficient in one way or the other [13].

AI in Petroleum Fraud Detection: Innovations and Applications

The petroleum industry is among the most crucial sectors and most diverse worldwide that focuses on the delivery of energy requirements in several production methods. While the industry is this large, it is also open to different types of frauds, for instance, oil fraud, financial fraud, and supply chain frauds. Various illicit actions in the petroleum sector can produce rather negative financial or reputational effects, thus the demand for effective fraud mitigation tools is high. Petroleum fraud is impending to be fought with the help of AI approaches; the later offers new ways to identify outliers and later fraud cases and means of preserving the integrity of transactions [14]. Due to the high amount of information processed and analyzed AI is capable of detecting suspicious actions and transactions that would be difficult to detect using the classical procedures.

As for now, let us pinpoint that the use of AI in petroleum fraud detection is mainly focused at the analysis of transaction data. Fraud in the petroleum industry entails the manipulation of the industry's financial books such as under registering in the amount of petroleum products sold or unauthorized redirection of stocked consignments to other unauthorized markets. Through sufficient advanced knowledge, the AI systems can employ the use of the ML algorithms when analyzing large data sets of financial transactions that may show suspected cases of fraud. Such algorithms may work with data extracted from price lists, shipment volume, and supplier's relationship, and reveal fraud indicators [15]. AI's have the ability to learn from new data and subsequently avoid the weaknesses seen in older fraud schemes in new systems. For example, where there is an identified line-up of fraudulent activities of a particular nature in a specific location or market, AI can use this information to identify similar fraud at another location facilitating quick response to fraud. Therefore, AI is playing an anti-fraud role when it comes to the oil and gas supply chain by enhancing visibility and traceability. Some examples of abuse in the supply chain include the contamination of oil, issuing fake documents concerning quantities or diversion of consignment to wrong destination. Apelike, IoT sensors powered by AI can track the movement of consignments in real-time and can track the movement of oil starting from the production centers, refineries, distributors and retailers. Perimeter to pipeline sensors or sensors placed on cargo containers monitor values such as temperature, pressure and flow rates and via artificial intelligence can flag any interference or attempts at meddling. This helps companies to go for real time fraud investigation, means that they can avoid being conform [concern] financially and also assure the quality of the product being supplied [16].

The other area where AI is applied is in the predictive analytics used to estimate fraud before it happens. This AI system involves drawing of past data and then using this data to determine where fraud is most likely to happen in the future. For instance, autopsy models can identify patterns of past fraudulent activities and therefore mark some locations, suppliers or routes that are often linked to fraud. This makes it easier for companies to move proactively by, for instance, increasing surveillance or putting more auditors in that area [17]. Also, due to AI's ability to predict, organizations can mitigate fraud risk before the sizable losses ensue by identifying these fraud patterns at their infancy. The two primary areas where AI can be applied to detect petroleum fraud include cybersecurity and other areas which will be discussed below. The petroleum industry like many industries depends on digital systems for activities including transaction and inventory processing as well as supply chain activities. Hence, the sector is a hotspot for cyber criminals, who may compromise the financial balance, compromise data and cause operational interruption. AI is playing a good role in increasing the safety of these digital systems through identifying cyber risks in actual time. Security technologies in the form of artificial intelligence can analyze network traffic and promptly detect undesirable behavior, prevent cyber fraud [18]. For instance, pattern analysis can identify schedules for accessing accounts or attempting to log in to an organization's financial platform implying a cyber-attack that can be quickly halted to check fraud.

AI is also used in increasing compliance and regulatory from the petroleum industries. It is very much monitored, and firms and businesses in the industry are answerable to numerous laws and guidelines to avoid engaging in unlawful practices including fraud, money laundering and corruption. AI can help to reduce the burden of compliance by inconsistently and automatically monitoring and reporting on regulations. Through machine learning, artificial intelligence can discover underlying patterns from hundreds of thousands of records produced by financial and accounting data, supply chain information or regulatory reports, to guarantee compliance with legislation. Based on company information, it is also possible for them to flag cases of regulatory misconducts like manipulation of prices or tax evasion by analyzing the information against recommended policies and laws [19]. However,

there are some issue that are worth discussing when it comes to incorporating the AI into petroleum fraud detection. The primary challenge is primarily attributed to the quality and access to data. AI systems work only when they are fed very clean, structured and standard data. Sometimes companies in the petroleum industry may realize that they are dealing with decentralized data systems or inefficient data management systems which may have incomplete and scattered databases which are not compatible with artificial intelligence systems. Further, the results of AI are only as credible as the data applied when developing the model, and despite carrying more impartiality, using diverse datasets with little to no bias leveled against it can enhance fraud detection.

The next issue is that the deployment of AI technologies is accompanied with high implementation costs. The implementation of AI digital fraud solutions is generally a capital-intensive process in terms of software and hardware investment, and human resources. The installation of these sophisticated systems may be beyond the reach of many small-scale ventures especially. However, this can be prevented in the future, but due to the constantly improving and more affordable AI complex, these difficulties should decrease in the future [20]. This paper discusses how AI is changing the way the petroleum industry addresses fraud by presenting better, faster and preventions rather than reactive solutions. In true sense, with integrated realistic tools of machine learning, predictive analytics, as well as with improved security measures, AI is proving worthy for eliminating all fraudulent incidents in the supply chain. Over time the technology behind real time fraud detection will advance, thus minimizing the financial losses as well as disruptions likely to be occasioned by fraud. The two major concerning areas, which include data quality and implementation cost, though presents useful challenges, the use of Artificial Intelligence in the determination of petroleum fraud provides better solutions that will form the future of the industry and overall security.

AI in Cybersecurity: Protecting the Future of Things

Since the integration of global communication through improved technology, cybersecurity has become an important issue in various sectors. In every sphere of life, from financial institutions, through healthcare and energy providers, organizations are dealing with huge volumes of data that are exposed to potential threats at all times. Even conventional security controls are sometimes insufficient to protect against increasing rates and potential cyber threats' complexity and diverse character. In this context Artificial Intelligence (AI) is a game changer when it comes to threat defense based protection of digital assets [21]. Through the use of machine learning, data analytics, and automation, AI is revolutionizing the cybersecurity space by making it much more proactive, dynamic and efficient. AI's greatest value in cybersecurity is in threat recognition and intelligence. There is a now a more serious form of threat especially through the Internet as other use advanced mechanisms to penetrate the previous barrier. Autonomous systems are quite efficient with the detection of anomalous behavior or activity in the network, data access, and system operations. Computational intelligence algorithms are capable of breaking down huge data in real-time and alert on any form of abnormal behavior likely to be as a result of a cyber-attack. For instance, AI may analyses when someone logs in at an odd hour, when someone accesses a restricted file or when traffic is anomalous – suggesting a DDoS attack. In contrast to other systems which depend on the rules set by humans, AI is able to identify new threats, which have not appeared before, and this is done faster and with better efficiency than traditional systems, as it learns from new data [22].

However, most importantly, AI is also improving the likelihood of discovering zero-day threats – a class of issues that hackers use in-between times when software developers manage to patch up the associated issues and the instances are not 'discoverable'. As it has been noted, zero-day threats are not picked up by standard, signature-based defenses, so any aid of AI would help since it can look for behavior patterns indicating an attack. This proactive approach to threat detection can exemplify the time and risk profile of the application before patch or update enabling a substantial prior time pre EXE to be minimized. Besides detection, AI in cybersecurity refers to the most important process of automating reaction procedures [23]. Cyber threat is a serious issue and what should be considered is that response times matter in case of a breach. AI has the ability to integrate into different stages of a data breach response and assists the security teams in response to the threats. For example, the AI systems can independently']=="The self-learning feature can also shut down the compromised systems or black-list the attacker's IP address, in a bid to contain the attack. AI can also determine the type of attack that is in progress and thereby respond appropriately in the most efficient manner. AI helps relieve many operational tasks that would otherwise keep cybersecurity professionals engaged in low-level log analysis, threat prioritization and early response containment measures [24].

The second important use of AI in cybersecurity is the usage of prediction mechanisms. AI can be used to get data analysis making it easy to predict weaknesses that may open up in the future or areas that a competitor is likely to attack. Based on historical cyber-attacks, data, AI systems can programmatically build models as to where and when the cyber-attacks are likely to hit. For instance, AI can study previous phishing attacks to try and identify the new phishing operations or identify motives of malware propagation that indicate preparation for a widespread attack. He had revealed that by assessing threats at an embryonic level rather than when

they are full blown, organizations are in a position to erect barriers to prevent an attack or lessen the possibility of one being successful. Another function of threat intelligence is predictive analytics that gives an organization insights as to where the next threat might be coming from. AI is also being applied more actively to enhance the protection of endpoints. As more devices connect to organizational networks, whether corporate-provided assets or personally owned such as mobile phones, laptops, or industrial IoT devices there is difficulty in securing all of them [25]. In endpoint protection solutions, activity on these devices is closely watched to identify behavior that is anomalous and therefore possibly due to the presence of malware, or a compromise. If possible dangerous actions are distinguished, accurate AI systems indicate them and ban the corresponding actions at once thus the threat will not spread across the network. This is especially relevant in the time of widespread remote work, where endpoints remain the weakest links in the Corporate Perimeter.

AI can find application in improving methods of user identification and authorization. This is because the currently existing password type of authentication solutions remain easily exploitable by methods like credential stuffing or brute force attacks. In this context, there are more secure AI technologies, namely, biometrics (fingerprint, facial recognition) and behavioral analytics. Another method of working is that progression design deploys sophisticated algorithms based on the users' characteristics, they may be the typing speed, the speed and direction of mouse movements and even the geographical location of the user and develops a profile on the user. Here, if there is an apparent variation in the approach for example if an individual, who usually log in from a specific IP address, logs in from a new IP, then the system will prompt extra forms of identification or refuse them access [26]. More advanced techniques of authenticating cut down the risks of program break-ins than the traditional methods, hence provide a better shield against the increasing incidences of hacking. However, there are certain issues exist when integrate AI into cybersecurity which is discussed below. Data privacy is perhaps one of the biggest concern since AI systems must retrieve large amount of data to be useful. What it must be guaranteed for AI solutions in cybersecurity is that the confidentiality of the processed data is preserved and the technologies work in compliance with the GDPR and other similar regulations. Furthermore, AI weakens the authority as irrespective of it has been trained on a specific dataset, if that dataset does not include specific threats or contain prejudice about users, AI will not address them. To reduce these risks, there must be iterative testing of the AI systems as well as integration of transparency and audit ability into the systems to facilitate subsequent updating of the system [27].

A fourth issue is the cost and human resources that must be put in to in order to adopt AI cybersecurity systems. AI and tools needed for cybersecurity are typically not inexpensive to build or deploy and may need a large investment in both hardware and software as well as personnel with specialized training. Small organizations may have limited resources to invest in an AI solution or may lack the resources and knowledge with regard to how this technology works in relation to machine learning as well as cybersecurity. Yet, as the number of advanced and easy-to-use AI-based products increases and as these tools become the components of comprehensive cybersecurity solutions, the barriers to their adoption should go down. Therefore, AI is not limited to its current real-life applications in combating cyber threats and will remain in the fore front in the future. Consequently, AI will be more and more involved to give machines that are able to learn from the new attacks and adjust the answer. Also, AI may help to grow end-to-end cybersecurity solutions that may operate independently from people on distinguishing and counteracting complex cyber threats [28]. Certainly, as more advanced AI solutions are developed, AI technologies will not only assist in protecting against current threats but will also provide methods for applying protection against other newly developed threats to organizations as they are created, thus making the future of cyberspace safer. AI is making the world of cybersecurity better by providing enhanced methods for threats identification, protection, and mitigation. AI is creating great opportunities for security through machine learning, predictive analytics, better automation and more robust user authentication systems for better protection of organizations' digital assets. The further development of AI is thus guaranteed, as it has the potential to deliver much stronger improvements in cybersecurity and …ıldığı<|human|>Of course, some problems are still present, such as data privacy concerns and the costs of implementation; however, the promise of moving toward much stronger pro- section from sophisticated and dangerous cyber threats means that the future development of AI will maintain strong growth.

AI in Predictive Maintenance: Improving Productivity in Industrial Processes

As the fierce market competition is common in today's business world, preserving the effective and proven operation of industries is crucial in cutting expenses while enhancing safety standards and productivity. In various industries, for example manufacturing, energy, and transport, routine upkeep is the most widespread approach that is employed, based on the assumption that equipment must be fixed only when it fails. Although these methods work effectively, they result in costly downtime, unscheduled repairs and overall system inefficiency [29]. The rise of smart analytics as driven with the help of Artificial Intelligence (AI) is revolutionizing how industries manage their equipment's by outlining indications that a specific equipment or component is likely

to fail and in this way, it can be managed appropriately. Of this shift from reactive to proactive maintenance, operational productivity is being improved, expenses slashed, and key economical and organizational infrastructures' durability is being optimized. Predictive maintenance involves the utilization of intricate information and analytical methods to estimate the point at which tools will fail to ensure that maintenance is executed only when failure is inevitable not when tools have developed faults. The main function of the AI system in the context of predictive maintenance is the continuous analysis of the data which are gathered from sensors, machine's logs, and records of the past service incidences. Thanks to algorithms of machine learning as well as big data, an AI system can detect signs and signals unrecognized by human operators. It provides an effective means for anticipating problems at an early stage, before becoming fully-blown downtimes or expensive repairs [30].

Real time data from IoT sensors fitted in industrial equipment is another area that benefits from AI in predictive maintenance. These sensors may include temperature, pressure, vibration and fluid level sensors since they signify the health status of the equipment. AI models can analyze this unceasing flow of data in real-time to detect signs of deviation from ordinary working conditions suggesting a condition of wear and sometimes potential failure. For example, in the manufacturing firm, it can take the role of identifying irregular vibrations in motors or bearings or even pumps that may indicate mechanical fault or fluctuations. Likewise in the energy sector, using AI it can be determined when a certain package or an equipment like a turbine or a pump will need repair or replacement. Another advantage of artificial intelligence used in machine learning applications is that they can adapt or identify patterns that were used to predict errors, over time. AI is able to integrate navigation and analyses previous maintenance logs and failure history to detect quite nuanced connections between other operation parameters and device failures. For instance, AI may find out that there exists some particular temperature ranges that contribute to higher rates of component breakdown in a particular kind of machinery [31]. Over time, new data comes into the system, allowing for more accurate and prompt predictions that can help minimize incorrect maintenance or inappropriately timed equipment failure.

The greatest advantage of predictive maintenance supported by AI is its capability to minimize costs of unscheduled downtime. If they fail they can pose severe consequences in industrial operations and manufacturing processes because they can result in production loss, accidents, and great expenses. Time-based or the conventional 'break-fix' practices are ineffective for they warrant unwarranted checks, greatly increase maintenance costs, and may lead to failure of equipment. This means that maintenance interventions can only be done when required, and hence AI enables the best practices that can help save resources and prevent breakdown to take place so that they can minimize interruption of the [32]. This is even more evident in industries including oil and gas, aviation, manufacturing and transport industries whereby, any disruption of service brings with it costly consequences. Apart from minimizing downtime, it enriches Predictive Maintenance, which deals with the planning of when to make maintenance. Maintenance personnel can concentrate on those specific components or equipment which need attention, instead of regular checks on the materials in good condition. This improves the operational cost since the technicians will be more effectively utilized. Moreover, maintenance works can also accessed via AI, in which maintenance activities with high priority according to the established system are attended first and thus, the repair operations do not disrupt the operation of the enterprise [33].

AI also assists greatly in increasing the shelf life of assets. Because it is possible to prevent problems before they cause heavy losses, predictive based maintenance aids in increasing equipment's durability. AI recommendations in planning and scheduling maintenance work guarantee that components that have worn out are fixed or even replaced before their useful life cycle expires, thus avoiding extremely costly replacements and keeping machinery productive for as long as possible. This staging of asset life leads to lower capital outlay and improved rate of return investments in industrial organizations. Consequently, the AI-based predictive maintenance has potentials for enhancing operational effectiveness and support sustainable development and protection of the environment. Thus, reducing the number of unscheduled repairs or replacement, AI contributes to the lesser use of resources and, thus, the environmental impact of operations [34]. For instance, in the energy sector AI can assist in the management of power plants and therefore utilize lower amount of energy as well as emitting less. Likewise, in the industries ranging in chemical and gases that are highly dangerous, the predictive maintenance will guarantee that equipment is running safely and no chance for leakage or failure takes place with negative impacts on the environment.

Of course, where the application of AI is to be found in predictive maintenance there are several factors that need to be addressed as to why it is not used more globally. The first of these challenges relates to the great cost that is incurred when implementing the two frameworks. Predictive maintenance using AI technology involves a heavy flow of IoT sensors, data architectures, and sophisticated analysis tools. Moreover, to ensure that works well, organizations have to train their personnel to use the systems, as well as to understand its output. That can be somewhat of an issue for small organizations with low budgets however as the technology advances the price is likely to decrease leaving almost any type of organization willing to implement such technologies. The other challenge is data quality as well as integration [35]. AI models are quite dependent on accurate, unadulterated, and

formatted data. In fact, for this purpose of using predictive maintenance, the data has to be correct and should have a certain level of standardization. A lot of companies struggle with data collection as it is delicate due to the fact that collections maybe outdated or partially done, or due to the fact that equipment may have inadequate sensors to record information. To overcome this challenge firms require to pump up their dollar investment in enhancing and acquiring equipment's and integrated data flow systems to gather and analyze data effectively. Still, there's a bright future in using AI for predictive maintenance of the facilities. With ongoing progression of AI technology, predictive capabilities will become enhanced in the upcoming future and this field will find its way towards effective utilization in maintenance. The increasing utilization of 5G connectivity and cloud computing will also facilitate or the organization's ability to gather and store large and real-time data to be used for AI systems [36].

AI in Cancer Medicine: Due to the groundbreaking advancements made by researchers and technologists, diagnosis and treatment have been deprived of a scientific revolution

Artificial Intelligence (AI) has taken root and integrated into nearly every area and aspect of cancer medicine. It means that we urgently need timely and accurate approaches to manage such a multifactorial and lethal illness as cancer around the world. In recent years, Information technology to aid in cancer diagnosis and treatment has grown to be an important resource in oncology with enormous potential in the improvement of early detecting tools, planning of cancer treatment, and in the discovery of new therapies [37]. Using big data in medicine and oncology, AI is helping to raise the diagnostic accuracy for cancer, choose the best treatment options and increase the mortality rate among patients. By far, the most promising application of AI in cancer medicine is in the identification of both early symptoms and causes. The accurate detection of cancer at an early stage is particularly important to enhance survival and therapeutic management, nevertheless most of the malignancies do not produce signs and/or symptoms until they are in later stages. This is through AI, reinforced by both machine learning (ML) and other deep learning (DL) algorithms, to help detect the disease in medical imaging at a quicker and more accurate rate. For example, with the use of artificial intelligence, scan results of X-Ray, CT, MRI, mammography or any diagnosis of an early sign of cancer could be seen using artificial intelligence than possibly could be seen by human review. It tightens AI algorithms that operate by scanning thousands of images and comparing them to teaching datasets encourage by human annotations to detail nuances of image contents usually beyond human discernment. For example, AI can, for instance, detect small tumors, or even changes in tissue density or growths that may be early signs of cancer [38].

Among all fields where early diagnosis can benefit from AI, there is no doubt that radiology is at the forefront. Convolutional neural networks (CNNs) , an advanced AI model has been observed as a more successful one in discovering the lung cancer and breast cancer and other malignancies. In detection of breast cancer for instance, AI aided systems work in reading mammograms in order to flag areas that could warrant further examination. Research findings show that AI in diagnosing can perform better than human radiologists or standard deviation of human performance with the chances of misdiagnoses or missed diagnosis being eliminated [39]. In addition, the use of the new technology known as the artificial intelligence is being used in genomic medicine to dissect the genetic basis of cancer. As a genetic disorder, understanding the gene mutations that cause cancer and that fuel the disease's progression is central to developing cancer therapies. Today AI algorithms are applied to the large scale genomics data to detect mutations, alterations, and biomarkers that pointing to the different forms of cancer. Current ML algorithms can identify specific DNA changes in sequencing data from tumor samples that can suggest different types of cancer. AI makes it possible for clinicians to examine these values and acknowledge which patients may benefit more from particular treatment programmers depending on their genetic traits.

After diagnosis of cancer, AI is also vital when it comes to treatment and even the planning of it. In oncology treatment choices are much nuanced, because they depend on the type of cancer that is present, cancer progression, patient's general health and the molecular characteristics of the cancer. Originally, treatment planning is more of a time-consuming and manual intensive affair; involving consultation with other disciplines and other protracted trial-and-error processes. Currently, AI has the ability to integrate the enormous patient data set and suggest the most relevant plan of action. Electronic Heath Records (EHRs), images, genome sequencing data and patients' reported experiences can be used to develop models to determine which treatment protocols will be most effective in a given patient. That is, all this information can be analyzed using machine learning approaches to recognize patterns and associations between treatments and patients' reactions, which might help oncologists select the curative and less hazardous treatments. Moreover, AI can predict in which way a cancer type will develop subsequently, helping clinicians to understand potential reactions of tumors to particular treatments and assisting in making decisions [40].

The second most important use of AI in cancer medicine is in drug discovery and development. The discovery of new cancer drugs is partly arduous, time-consuming, costly, and highly speculative and may take several years to produce an outcome. AI is adding

to this process by providing researchers with a shortcut of identifying new drug candidates. Big databases of chemical compounds are being scanned with machine learning algorithms to identify those that would potentially have an anti-cancerous effect on tumor cells. AI can also help to create better medications by studying molecular specifics of cancer cells to determine the points of contact for drugs used. For instance, with the help of AI, one can build real-like models of cancer cells' reactions to certain drugs and how these or similar cells will behave after starting the administration of a given drug [41]. Apparently, this ability to predicting the efficacy of drug candidates before a trial can greatly decrease the time and costs of introducing new cancer therapies to the market.

The applications of AI include early detection of treatment response as well as relapse. In the case of cancer, after this initial treatment is completed, patients require ongoing evaluation to determine if this disease has been cured or will likely return. Computerized systems can review a patient data history for possible signs of cancer return or spread. For instance, where the patient has been treated with chemotherapy and later receives further scans of the same body part, the AI can look at enhancement differences to see if the tumor is growing or has changed in a way suggesting the cancer has resurfaced. Likewise, AI models can obtain biomarkers from blood tests that show the presence of cancer cells or DNA that helps the clinician know the patient's condition and whether changes need to be made to the treatment plan. Nevertheless, there is a number of barriers to the proper application of AI in cancer medicine: Main among these challenges is the ability to implement AI in clinical settings. That is why to become effective the AI systems should be integrated into clinical environment as deep as possible. This includes optimization of data input from imaging, EHRs, genetic information and lab data that feeds into implementing artificial intelligence. Furthermore, it is crucial to understand that healthcare providers themselves need to be trained in how to understand the insights that AI may provide and then ingrain these insights into their workflows. Another issue is an ability to acquire the necessary information, and its quality. Of high importance is the fact that training of the AI algorithms depends on the availability of relevant sets of massive data of good quality [42]. In the case of cancer medicine, this would entail easy availability of a large amount of disparate data, such as trial data, patient-genomic data and more. Another area that has to have a favorable response is patients' privacy and security of their data to avoid leakage of critical patient information.

AI in Petroleum Fraud Detection: Safeguarding the Industry

This shows that the petroleum industry is one of the basic world industries responsible for fuelling the world economy by acting as a source of energy for transport, industry and warmth. However, it also has it waypoints, one of them being Petroleum fraud. This issue includes such offenses as: The provision of false information concerning the amount of depicted oil reserves; The manipulation of the volume, as well as the quality of exported and imported petroleum products which may result in considerable monetary losses, pollution, or legal noncompliance. Whereas in the past fraud was a relatively simple act involving the manipulation of a few buyers and sellers, today, thanks to the integration of the industry with advanced digital tracking systems of production, distribution, and consumption, fraud has become much more complex [43]. To counter these threats, the option of AI has been proved to be an effective tool to fight against the petroleum fraud along with preventing and mitigating measures that is offers innovative solutions to the industry for the purpose of safeguarding its assets along with up keeping the integrity.

There are different forms through which fraud occurs in the petroleum business, and each is a stumbling block to the efficiency of the sector. Another familiar form of a fraud on the stock market is the inventory fraud, which is the act of inflating the amount of petroleum reserves or/and production. It can be achieved for skewing stock market prices, to lure investors or for meeting certain contractual obligations. Another type of fraud is connected with the transportation and distribution of petroleum products, when, for example, through theft, or over-stating of deliveries, oil and gas are either stolen or sold illicitly. A pretty serious kind of fraud in the field of petroleum is associated with the wrongful manipulation of price such as providing misleading information or having an unlawful cartel, embracing all types of prices, starting from the price of the crude oil and ending with the price of gasoline at the filling stations. Another important type of fraud is environmental fraud and manipulation of information concerning emissions and pollution deriving from oil and gas activities; it relate on compliance and corporate image [44].

Several benefits come with using AI in the detection and prevention of fraud in the petroleum industry as compared to conventional method. Using this approach's most important advantage, it can process a large amount of complicated data in real-time. Fraud control in the petroleum Industry may include any or all of the following; Transaction Control, Production Control, Transportation control, and Compliance control. Due to the large size of this data, AI systems, especially, machine learning (ML) and deep learning (DL), are capable of analyzing this data and finding the correlation and difference that represents fraud. That is why AI in case of big data prevents irregularities that are too complex or too fine for an analyst to detect. A key that, AI plays a crucial role to identify frauds is through the analysis of anomalies. Such scenarios indicate that through the seamless canalization of data from different sources, artificial intelligence algorithms can identify what looks like the normal realities within the petroleum supply chain and

thus detect any failures to conform to these standards [45]. For example, if a refinery supplies information about its production exceeding a standard level up to some definite period, or if transportation records contain information about the difference between the amount of oil stated to have been delivered and the amount actually invoiced, such shifts can be noted by AI systems andδ Responsibilities of staff:- If the staff is not accountable for all the tasks, it is crucial to define the specific responsibilities of each person. Furthermore, it is possible to implement AI models that will perform the identification of such features, as duplicate transactions or other kinds of fraud invoicing practices, which may be useful in observed irregularities in billing or payment schemes.

At this context, the power of AI can be exerted in preventing collusive business strategies in the market. Speculation and collusion always take place in those industries that have very little public disclosure. Advanced algorithms can be applied as a technical analysis to detect the abovementioned indicators of suspicious actions utilizing price data of the product and its prices in different regions, supplied by different suppliers at different time periods. Coupling changes in the price data with any other event that takes place in the market, for example, political upheavals, calamities or alterations in production rates, AI systems can identify steep slopes in prices as latent fraudulent activities [46]. These algorithms can also detect the signs of collusive behavior between competitors, including similar price increase or odd pattern of bidding in procurement services. Another area, which AI is infiltrating, is the identification of the environmental fraud. A number of petroleum companies are obliged to disclose emissions, waste, and other effects on the environment, and differences in these records may mean fraud. Real time monitoring of data received from sensors and IoT device used in refineries, pipelines, and transportation system can be done using AI to verify that actual emission levels are in accordance with the set regulatory standards and the reported figures. Combined with the sensor data, AI systems can eventually detect the irregularities to the accuracy of the organization's reports indicating fraudulent environmental data, which are important for compliance and sustainability [47].

Besides, fraud detection, AI is improving the performance of predictive analytics and risk management in the petroleum industry. It is quantifiable to establish the kind of fraud incidents took place in the organization or have been reported in the past by applying AI algorithms and establish relationship of causes and effect of these fraud. This lets organizations understand where and when fraud is likely to happen and prevent it ahead of time to avoid it becoming worse. For instance, churn-prediction AI models can show possibility of the specific risk factors including market conditions, financial pressures, or changes in personnel, which may well propel fraudulent behavior. The greatest advantage of identifying these high risk areas is that organizations can be able to direct most of its efforts and resources in preventing actual fraud in this area of manipulation. It is useful for AI to be able to construct risk profiles based on the defects in the previous fraud for identifying potential risks at the supply chain, procurement, and controls or financial systems [48]. Through AI, companies are able to set up live risk management frameworks which give current information about the health of an organization. They not only detect fraud but also they assist in decision-making and business planning by integrating fraud risk into the operation environment.

To increase transparency, as well as to murder fraud the combination of AI with block chain technology has become a perspective way in the petroleum industry. Block chain is yet another technology which ensures that any records of transactions cannot be easily manipulated by fraudsters as the record keeping system is almost entirely transparent. AI may complement block chain by real-time monitoring and analyzing the block chain data for any sign of fraudulent activities. For instance, AI can use block chain records to determine any anomaly in oil and gas supply chain between providers and consumers or instances of fake invoices in supply chain. Therefore, there is a need to put together AI's high level analytic features with the security and block chain transparency to come up with a stronger shield against the fraudulent activities in the petroleum industry [49].

However, there are several limitations to these studies in the implementation of an AI system for the prevention of petroleum fraud. The first of them is data quality and accessibility as the source of either structured or unstructured data is a significant challenge. The strength of any AI system based on big data to perform the function of 'detecting fraud' depends on the availability of high quality big data information. Unfortunately, the implementation of many current applications for managing data in organizations in the petroleum industry continues to use legacy systems that at best, may deliver inefficient and inaccurate data. Further, data privacy and security are important concerns as customers' financial and operating data which are vital for their business performance have to be safeguarded against cyber risks. A third challenge is how best to implement AI in the current systems. Oil organizations are usually large total and they included many forms of activities which impact many parties including suppliers, distributors, regulatory agencies, and financial companies [50]. In order for AI-based fraud detection systems to fit into these existing processes properly, considerable investment must then be made into the technology systems for carrying it out and into imparting better fraud detection knowledge to those involved in the processes.

Moving forward, the development of various forms of artificial intelligence technologies, like the NPL for analyzing contracts and text data and reinforcement learning to improve detection algorithms, would give more features to such AI systems in preventing petroleum fraud. In the future, particularly as the development of AI progresses, block chain and other security techs will be combined in order to provide even greater security for the petroleum sector and to clarify transparency [51]. AI is changing the way how the petroleum industry fights fraud. Thus, AI is serving the purposes of identifying and preventing major sources of revenue losses, non-compliance with regulations, and negative outcomes to industry reputations. When properly applied, AI can allow petroleum formulates to predictable control unsavory practices, shield their property from dangers, monitor conforming to the law and being transparent. AI's role is only going to grow as the technology wonk on and the field of petroleum fraud prevention becomes even more closely linked with the future of a more secure, efficient, and transparent industry.

Conclusion

It is apparent that Artificial Intelligence (AI) is an effective solution for many spheres of human life: healthcare, the petroleum fraud detection, and cybersecurity and cancer medicine. Changing the approach to cancer therapy by means of enhanced diagnostics and individualized treatments, helping to protect the petroleum industry from fraud, the opportunities of AI are proactive both in deal-making and in minimizing risks at the industry level. AI is now helping to find drugs faster, diagnose diseases earlier and plan treatments in healthcare – all of which we can consider victories for patients and for overall efficiency. Another area of application of AI is anti-fraud in the petroleum industry where it is applied to reduce and eliminate cases of fraud that would otherwise lead to monetary loses and present DataStream Media a clear image of its operations and the whole business. It is also clear that AI has a crucial function in predictive maintenance and cybersecurity in improving all industrial processes and in protecting valuable data. From averting system failures from taking place to detecting cyber threats with an unprecedented level of precision, industries are gradually becoming less reactive and more protective and responsive to emerging challenges. Moreover, the enhance of AI by the incoming technologies like block chain, brings enhanced transparency, security, and trust in various sectors.

With AI technology being so promising in these ways, challenges that have not been well addressed include quality of data, integration with other existing systems and the need to qualify a lot of people in this area. Nonetheless, as AI becomes more ingrained in industrial and healthcare environments, these barriers are expected to reduce which will lead to revelation of AI-driven solutions, in so many sectors. AI has the capacity to revolutionize industries, organizations and firms, avoid or minimize risks and bring positive change into our lives. As new generations of AI technologies will appear and develop, they will inevitably require deeper and superior introduction in the fields of healthcare, energy, fraud detection and cybersecurity, among others, resulting in their initiation of a new transformed model of industry evolution and value innovation. The expectations of AI in the future are for better intelligent, quick decision and better interventional tool to evolve and become a fundamental tool in effective, safe and sustainable future.

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