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AI Utilizations in Healthcare: Discovering New Methods for Cancer Treatment and Petroleum Fraud Mitigation

Alexandra Harry
Independent Researcher Washington DC USA
Alaxendraharry37@gmail.com

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Corresponding Author

Alexandra Harry

Alaxendraharry37@gmail.com

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ABSTRACT

This article explores how artificial intelligence (AI) is revolutionizing two important industries: healthcare and the detection of petroleum fraud. The application of AI technology promises to improve patient care, operational effectiveness, and decision-making as they develop further. Through individualized therapies, increased diagnostic precision, and optimized operations, machine learning and data analytics can transform patient management in the healthcare industry. Examples of such applications are IBM Watson for Oncology, Google Deep Mind's diagnostic systems, and PathAI. To fully utilize AI in healthcare, issues including algorithmic bias, data privacy, and regulatory compliance must be resolved. Leading firms in the petroleum sector, including Shell, BP, and Equinor, have implemented AI-driven fraud detection systems to monitor supply chains, analyze transaction data, and evaluate risks in order to enhance operational transparency and financial integrity. The industry's security is further improved by the combination of block chain technology and artificial intelligence. Organizations, however, have difficulties with data quality, moral dilemmas, and the requirement for ongoing AI system development. A strong framework centered on data integrity, stakeholder participation, and ethical behaviors is required for the successful application of AI in both industries. Organizations may successfully manage today's problems by adopting interdisciplinary collaboration and learning from case studies, which will ultimately improve patient outcomes, operational integrity, and service delivery. This essay demonstrates the profound effects of AI in a variety of fields and stresses the necessity of responsible and creative uses to promote a more effective, open, and just future.

INTRODUCTION

One of the 21st century's most revolutionary technologies, artificial intelligence (AI) is transforming a number of sectors, including healthcare and the oil and gas industry. AI is proven to be a crucial tool in tackling some of the most important issues these areas are facing because of its capacity to handle enormous volumes of data, spot patterns, and make intricate decisions. AI is greatly enhancing patient outcomes, treatment planning, and diagnostics in the healthcare industry, especially in the field of cancer therapy [1]. At the same time, artificial intelligence is being used in the petroleum sector to combat fraud, a recurring problem that threatens the sector's financial integrity and credibility. With an emphasis on cutting-edge techniques for cancer treatment and creative approaches to fraud detection in the petroleum business, this article examines the ways artificial intelligence is being applied in these two disparate but crucial industries [2].

AI applications are especially well-suited for the healthcare industry, which produces large and intricate datasets. Clinical trial results, imaging, genomic data, and electronic health records (EHRs) are just a few examples of the abundance of information in the healthcare sector that, when appropriately utilized, can result in major improvements in patient care. The efficiency and personalization of healthcare procedures are being revolutionized by AI's capacity to evaluate this data, spot trends, and produce insights. The use of AI in cancer treatment is among the most intriguing applications of AI in healthcare. Since cancer is a complicated and diverse illness, increasing survival rates requires prompt diagnosis and efficient treatment strategies. However, conventional cancer detection and treatment techniques frequently depend on broad strategies that might not be effective for all patients [3]. AI is enabling tailored medication, which is changing this. Healthcare professionals may now customize medicines to each patient's exact condition by using AI-driven analysis of patient-specific data, including genomes, lifestyle factors, and medical history. In order to enable more specialized therapy, machine learning (ML) algorithms are now being created to forecast how patients will react to particular treatments.

AI is also essential to the diagnosis of cancer. Imaging methods like MRIs, CT scans, and X-rays provide enormous volumes of data that need careful examination. In order to find early indications of cancer, AI-powered image recognition

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algorithms can swiftly and precisely examine these photos, frequently spotting anomalies that the human eye might overlook. These devices not only increase diagnostic accuracy but also drastically cut down on scan analysis time, allowing for quicker diagnosis and early therapeutic actions [4]. AI is revolutionizing healthcare, but it is also making big advances in sectors like oil and gas, especially in the area of fraud detection. In the petroleum sector, fraud can take many different forms, such as falsifying financial records, underreporting gasoline amounts, manipulating transactional data, and interfering with pricing. In addition to harming the industry's brand and credibility, fraud in this sector can result in significant financial losses. The complexity and volume of today's transactions make traditional fraud detection techniques—which frequently rely on manual auditing procedures—increasingly inadequate [5].

By using sophisticated algorithms that can identify trends and abnormalities in real-time, artificial intelligence (AI) presents a novel method for detecting fraud. Artificial intelligence (AI) systems can identify questionable actions that need more research by examining big datasets including financial accounts, inventory logs, and transactional records. For example, machine learning models can recognize patterns of behavior linked to fraud by learning from past data. Over time, these models' accuracy can increase steadily, increasing their capacity to identify potentially complex fraud schemes [6]. Predictive analytics powered by AI is also essential for stopping fraud before it starts. Predictive algorithms can give early warnings of possible fraudulent activity by spotting patterns and departures from typical behavior. This enables businesses to reduce the risk of fraud by taking proactive steps like tightening controls or carrying out focused audits [7].

Although the uses of AI in the healthcare and petroleum industries may appear to be different, there are fundamental parallels between the difficulties these fields encounter, especially when it comes to organizing and evaluating huge datasets to enhance decision-making. AI's capacity to identify trends, streamline procedures, and forecast results is proving to be quite useful in both domains. AI technology will probably become more deeply integrated into these industries as they develop, producing more sophisticated and potent instruments for enhancing patient care and maintaining financial integrity. To sum up, artificial intelligence (AI) is more than simply a tool for process automation; it is also turning into a vital ally in the fight against some of the most difficult problems facing the healthcare and oil sectors [8]. AI is influencing both industries' futures by improving cancer treatment through early detection and personalized medicine, and by thwarting fraud through real-time analytics and predictive modeling. The potential uses of AI will grow even more as technology develops, providing fresh approaches to boost productivity, lower risks, and ultimately produce better results in the healthcare and business sectors.

APPLICATIONS OF AI IN THE TREATMENT OF CANCER

Healthcare practitioners' approaches to the diagnosis, treatment, and management of this complicated illness have changed significantly as a result of the introduction of artificial intelligence (AI) into cancer care. There has never been a greater need for novel, efficient, and individualized treatment approaches because cancer is one of the world's major causes of morbidity and mortality. AI is revolutionizing cancer care in a number of ways, from early detection to therapy optimization and patient monitoring, thanks to its ability to scan enormous datasets, identify trends, and offer insights [9].

Using Machine Learning to Develop Tailored Cancer Treatments: The creation of individualized treatments for each patient is one of AI's most significant contributions to cancer treatment. Because every tumor has a different genetic composition, traditional cancer treatments frequently take a one-size-fits-all strategy, which may be less effective. However, genetic information from tumor samples can be analyzed by machine learning algorithms to find certain mutations and changes that define a person's cancer [10]. AI can help oncologists select the best therapy options by combining this genomic data with clinical information. Based on the genetic profile of the tumor, for example, tailored therapies—which concentrate on particular genetic markers—can be suggested, optimizing effectiveness while reducing side effects. AI can also assist in detecting possible resistance to specific therapies, allowing medical professionals to make preemptive strategy adjustments.

AI in the Early Diagnosis and Detection of Cancer: The likelihood of a successful course of treatment and patient survival is greatly increased by early identification of cancer. The speed and precision of cancer diagnosis are being greatly improved by AI technologies. Imaging methods including MRIs, CT scans, and mammograms are essential for detecting cancer. But deciphering these pictures can be difficult and calls for knowledge that isn't always accessible. Imaging data may now be accurately analyzed by AI-driven image recognition systems. To find minute patterns and irregularities in scans that can point to the existence of cancer, these algorithms make use of deep learning techniques [11]. AI systems, for instance, have been created that are capable of detecting breast cancer in mammograms with a sensitivity that is on par with or higher than that of skilled radiologists. These developments enable speedier treatment decisions by increasing diagnostic accuracy and decreasing analysis time.

Using Predictive Modeling to Forecast Treatment Results: AI is being used to anticipate treatment outcomes based on patient-specific data, in addition to assisting with diagnosis. Machine learning algorithms can predict how various patients may react to specific medications by examining past data from clinical trials, treatment outcomes, and patient demographics. Oncologists are able to make well-informed decisions on treatment strategies thanks to this predictive power. AI, for instance, can identify individuals who may have significant side effects or who are more likely to fail treatment, enabling the consideration of alternate medicines or early interventions. Additionally, by optimizing treatment and follow-up care scheduling, predictive analytics can improve the overall effectiveness of cancer management [12].

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AI-Powered Oncology Drug Discovery: Traditionally, the process of creating new cancer medications has been expensive and time-consuming, frequently requiring years of research and billions of dollars. AI is transforming this field by speeding up the drug-discovery process. AI algorithms can quickly examine the relationships between possible medication molecules and target proteins linked to cancer using methods like virtual screening and molecular modeling. AI can speed up the process of finding new medication candidates by forecasting which compounds are most likely to be successful against particular cancer types [13]. Additionally, AI can help repurpose current medications for novel therapeutic applications, greatly cutting down on the time and expense involved in introducing novel medicines to the market.

AI in Decision Support and Patient Monitoring Systems: AI is improving cancer patient monitoring throughout treatment. Real-time data on patients' health indicators, including vital signs, medication adherence, and symptom reporting, can be gathered using wearable technology and mobile health apps. AI algorithms can be used to examine this data and identify any changes in a patient's condition that would call for quick care [14]. Oncologists can receive evidence-based recommendations customized for each patient profile from AI-based decision support systems. These systems help healthcare personnel make well-informed treatment decisions by combining data from several sources, such as patient histories, clinical guidelines, and ongoing research.

AI-POWERED INNOVATIVE METHODS IN CANCER TREATMENT

The introduction of artificial intelligence (AI) is causing a significant change in the field of cancer. As cancer grows more complicated and common, cutting-edge AI-driven approaches are replacing and sometimes even augmenting conventional techniques of diagnosis and therapy. In addition to improving the efficacy of cancer therapy, these innovative techniques open the door for customized medicine, which customizes therapies based on the unique traits of each patient and their malignancy [15]. The integration of genomes, improvements in imaging technologies, immunotherapy optimization, and patient monitoring are some of the cutting-edge uses of AI in cancer medicine that are examined in this section.

Combining AI and Genomics for Precision Oncology: The combination of AI technologies with genomics has been one of the biggest advances in cancer treatment. Tumor genomic profiling enables a better comprehension of the genetic changes that propel the development and spread of cancer. However, deciphering genetic data is difficult and calls for sophisticated analytical techniques. Large genomic sequencing datasets can be analyzed by AI algorithms, which can then find patterns and mutations that are essential for creating tailored treatments. Oncologists can develop individualized treatment plans that maximize results by using machine learning models to forecast how various genetic alterations will react to particular medicines [16]. For instance, based on the unique genetic features of individual tumors, AI can assist in identifying patients who are most likely to benefit from targeted therapy, such as immune checkpoint inhibitors or tyrosine kinase inhibitors. In addition to increasing treatment effectiveness, this precision oncology strategy lowers the possibility of side effects linked to less targeted medicines.

AI in Imaging-Based Cancer Detection and Radiology: A key component of cancer diagnosis and treatment monitoring are imaging tools. However, analyzing imaging data takes a lot of time and demands a high level of skill. With imaging modalities including computed tomography (CT), magnetic resonance imaging (MRI), and positron emission tomography (PET), AI-driven image recognition systems are now improving the precision and effectiveness of cancer detection [17]. Imaging data may be analyzed by deep learning algorithms with previously unheard-of speed and precision. These systems can identify patterns that might be suggestive of cancer since they have been trained on vast collections of annotated photos. For example, AI systems can help spot breast cancer in mammograms or early-stage lung cancer in CT images, frequently beating human radiologists in terms of sensitivity and specificity. In addition to speeding up the diagnostic procedure, this skill raises the possibility of early discovery, which is essential for effective treatment [18].

AI-Powered Immunotherapy Enhancement: Immunotherapy, which uses the body's immune system to combat cancer cells, has become a ground-breaking method of treating cancer. Immunotherapy's efficacy can, however, differ greatly from patient to patient, making it difficult to forecast who will benefit from these treatments. By evaluating biological and clinical data to find biomarkers that predict response, artificial intelligence (AI) technologies are significantly contributing to the optimization of immunotherapy. AI models can assist physicians in determining which patients are best suited for immunotherapy by combining information from immunological profiling, genomic sequencing, and patient demographics. For instance, tumor microenvironments can be analyzed by machine learning algorithms to assess the possibility of a checkpoint inhibitor response [19]. AI can also aid in the creation of combination treatments, which combine immunotherapy's benefits with those of other therapeutic approaches to potentially improve therapeutic results.

AI's function in decision support and patient monitoring systems: AI is also transforming how medical professionals keep an eye on cancer patients during their course of therapy. Vital signs, physical activity, and treatment compliance are just a few of the health variables that may be continuously monitored thanks to real-time data collecting via wearable technology and smartphone apps. In order to enable prompt treatments, AI systems can evaluate this data and identify early indicators of difficulties or side effects associated to treatment. Additionally, oncologists are increasingly using AI-driven decision support systems as vital tools. These systems offer evidence-based recommendations that assist in directing treatment decisions by combining clinical guidelines, research data, and patient-specific information. To improve patient safety and treatment efficacy, an oncologist might be notified about possible drug interactions depending

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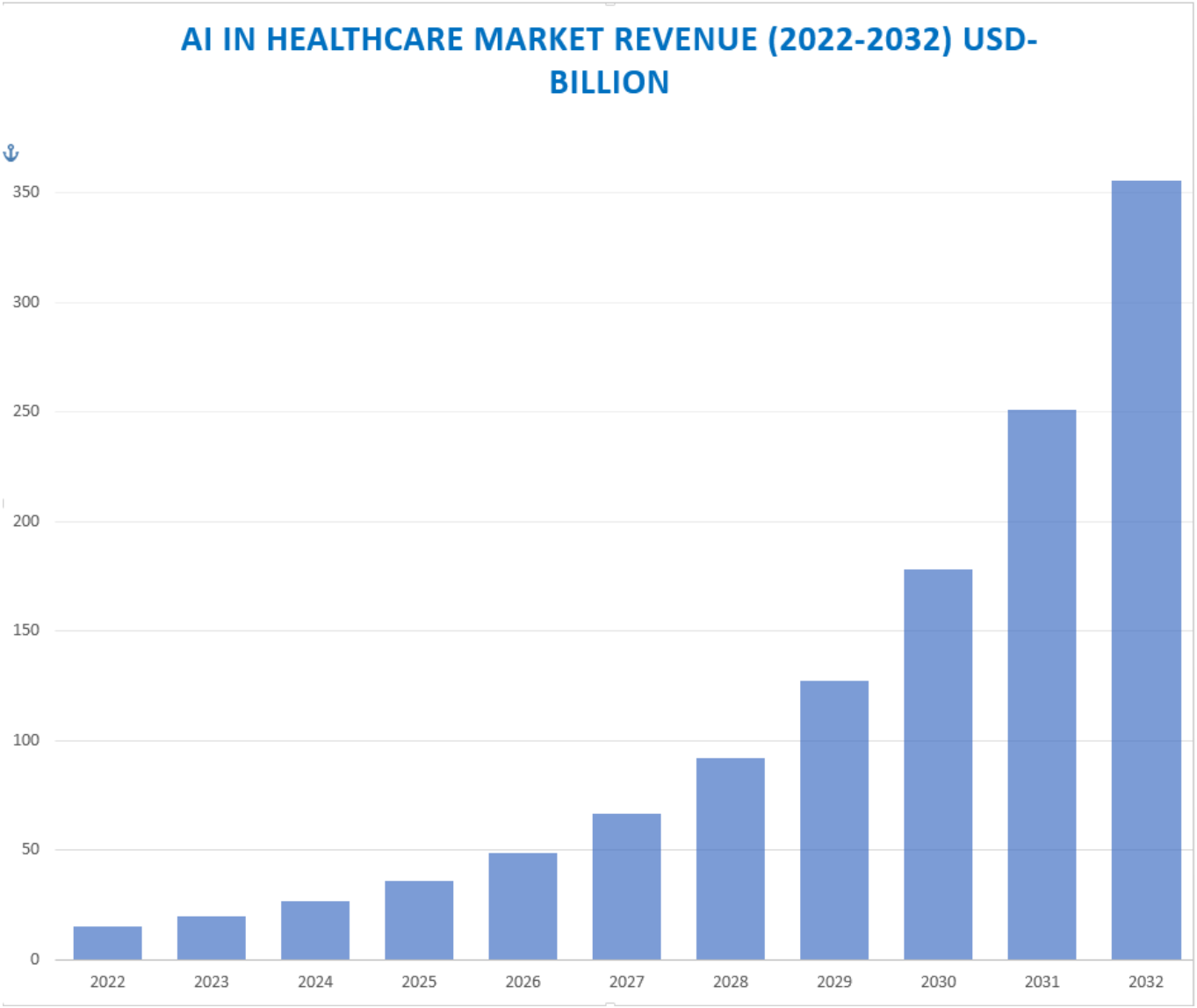
on a patient's current prescriptions and health status [20].

AI IN HEALTHCARE REVENUE

This figure showing artificial intelligence in the healthcare revenue from 2022 to 2032 in the USD-Billion.



This graph showing AI in healthcare market revenue (2022-2032) USD-Billion

AI IN THE IDENTIFICATION OF PETROLEUM FRAUD

Significant dangers of fraud in the petroleum sector include monetary losses, fines from the government, and harm to one's image. Because of the intricacy of petroleum operations and the sheer volume of transactions, fraudulent acts, such as underreporting production or manipulating pricing, might take place. The scope and complexity of contemporary fraudulent schemes are too great for traditional fraud detection techniques, which frequently depend on human audits and inspections [21]. The application of artificial intelligence (AI) in this field is transforming fraud detection by offering creative ways to recognize, stop, and lessen fraudulent activity.

An Overview of the Problems and Difficulties with Petroleum Fraud

The petroleum sector is vulnerable to a number of fraud schemes, such as:

Underreporting Production: In order to avoid paying taxes or royalties to governments and stakeholders, companies may underreport the quantity of oil or gas they generate [22].

Pricing Manipulation: Businesses may use dishonest tactics, like banding together to determine prices or faking market

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data to affect trade prices.
Gasoline diversion is the practice of diverting gasoline meant for legal purposes into the illegal market, which causes governments and businesses to lose a lot of money [23].
Contractual Fraud: When provisions are changed or not upheld in supplier contracts, dishonest practices may occur, resulting in monetary losses [24].
These difficulties need for strong and effective systems to identify and stop fraud, which makes sophisticated analytical tools necessary.
AI Techniques to Find Inconsistencies in Transactional Data: AI is a potent tool for detecting fraud in the petroleum sector because of its capacity to evaluate enormous volumes of data and spot trends. Businesses can automate transaction monitoring by using machine learning algorithms. This enables real-time analysis and prompt detection of irregularities that might point to fraudulent activity. To find baseline patterns of typical activity, anomaly detection systems, for instance, can sort through millions of transaction records [25]. After identifying these trends, the AI system can identify any abnormalities, including sudden increases in production reporting or irregularities in bank transactions. This greatly lowers the possibility of human error that comes with manual evaluations while also improving the pace at which possible fraud is detected.
Using Predictive Analytics to Stop Fraud: Another crucial use of AI in the identification of petroleum fraud is predictive analytics. Machine learning models can determine risk variables and forecast potential fraud hotspots by utilizing historical data on past fraudulent behavior. A predictive model might, for example, examine previous instances of production underreporting and pinpoint specific operational trends or outside circumstances that frequently precede such fraud [26]. Because of this foresight, businesses are able to take proactive steps like tightening monitoring in high-risk areas or putting stricter checks in place for specific procedures. Organizations can safeguard their financial interests and stay in line with regulations by foreseeing fraudulent behaviors before they happen.

EXAMPLES OF EFFECTIVE AI USE IN FRAUD DETECTION CASE STUDIES

With encouraging outcomes, a number of petroleum businesses have already begun incorporating AI technologies into their fraud detection strategies:
Shell: Shell has put AI-powered technologies in place to keep an eye on logistics and gasoline transactions. The business can identify irregularities that can point to fraud by examining trends in supply chain data, such as differences in fuel delivery and sales reports [27]. This strategy has increased their operating efficiency and enhanced their capacity to detect fraudulent activity.
BP: To examine financial activities throughout its international operations, BP has applied machine learning algorithms. By creating a baseline of typical transaction behavior, BP is able to promptly spot anomalies that need more research. The time and resources required for manual audits have been greatly decreased by this AI-driven approach, enabling more targeted and efficient investigations [28].
Equinor: Equinor has created artificial intelligence (AI) systems that examine supplier relationships and contract data to find any fraud threats. Equinor's capacity to monitor contractual integrity is improved by automating the review process, which enables them to promptly flag contracts that display questionable terms or trends [29].
Difficulties and Moral Aspects: AI has a lot of promise to improve fraud detection in the petroleum sector, but there are drawbacks as well. Careful management is required to address concerns about algorithmic bias, data privacy, and the interpretability of AI-driven conclusions. To prevent biases that can result in false positives or negatives in fraud detection, organizations must make sure that the data used to train AI models is representative, accurate, and ethically sourced. Concerns of transparency and accountability are brought up by the dependence on AI systems [30]. Stakeholders need to be aware of how AI systems make judgments, especially when those conclusions have important legal or financial ramifications.
The application of AI to petroleum fraud detection signifies a radical change in how businesses handle fraudulent activity in the sector. Organizations may safeguard their financial interests and guarantee regulatory compliance by proactively identifying and mitigating fraud by utilizing machine learning and predictive analytics. It is anticipated that as the technology develops further, its uses in fraud detection will grow, providing even more advanced instruments for improving operational integrity in the petroleum industry. Maximizing the advantages of AI while resolving the difficulties and moral dilemmas that come with its application will require constant cooperation between data scientists, business leaders, and regulators. The petroleum business may improve its ability to fight fraud and create a more open and reliable operating environment by adopting these cutting-edge strategies [31].

AI'S CROSS-SECTOR BENEFITS: PETROLEUM AND HEALTHCARE

With notable developments in the healthcare and petroleum sectors, artificial intelligence (AI) has become a key factor

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in the transformation of numerous industries. Despite the unique difficulties these sectors face, artificial intelligence (AI) has overlapping advantages that cut beyond industry borders and offer creative ways to boost productivity, accuracy, and decision-making [32]. The typical AI techniques used in healthcare and petroleum are examined in this part, along with the benefits that both industries gain from integrating AI and the potential future of these multidisciplinary applications.

Typical AI Methods in Both Industries: Natural language processing (NLP), data analytics, machine learning (ML), and deep learning (DL) are some of the technologies that fall under the umbrella of artificial intelligence (AI). Each of these methods has been used in the petroleum and healthcare sectors, allowing businesses to efficiently use data [33].

Deep learning and machine learning: ML and DL are used in the healthcare industry to evaluate large datasets, including patient records, genomic data, and medical imaging. These technologies aid in better diagnosis accuracy, tailored treatment regimens, and disease prediction. Deep learning systems, for instance, can be trained to identify abnormalities in imaging tests, like MRIs or X-rays, which could help identify diseases like cancer early Similar machine learning and deep learning algorithms are used in the petroleum sector to evaluate operational and transactional data in order to spot trends that could point to fraud, streamline supply networks, and anticipate equipment problems [34]. These algorithms can create predictive models that increase operational effectiveness and reduce hazards by utilizing past data.

NLP, or natural language processing: Unstructured data from research publications, clinical notes, and patient feedback is processed and analyzed in the healthcare industry using natural language processing (NLP). Healthcare professionals can improve patient interactions, expedite documentation procedures, and extract insightful information thanks to this capacity NLP is used in the petroleum industry to analyze market reports, contracts, and regulatory documents [35]. NLP assists businesses in improving compliance, evaluating risks, and formulating well-informed strategic decisions by automating the extraction of pertinent information.

Analytics of Data: The foundation of AI applications in both industries is data analytics. Analytics are used in the healthcare industry to assess treatment efficacy, resource usage, and patient outcomes. These insights can be used by organizations to enhance patient management and care delivery. Analytical tools are also employed in the petroleum sector to track production statistics, analyze market trends, and appraise financial results. Businesses may increase revenue and streamline operations by utilizing data analytics [36].

BENEFITS OF AI INTEGRATION FOR BOTH PARTIES

There are several benefits for both healthcare and petroleum when AI technology are integrated:

Better Ability to Make Decisions: By offering data-driven insights that can direct clinical and operational decisions, artificial intelligence (AI) improves decision-making. While AI helps executives in the petroleum industry with risk management and strategic planning, AI solutions in healthcare assist physicians in making better treatment decisions [37].

Improved Precision and Accuracy: Artificial intelligence (AI) systems are capable of more accurate data analysis than humans. This results in more trustworthy fraud detection in the petroleum industry and more accurate diagnosis in healthcare. In the end, more accuracy leads to safer corporate operations and improved patient outcomes.

Scalability: Because AI solutions are scalable, businesses can adjust to increasing operational needs and data quantities [38]. AI can effectively process and evaluate the growing amount of patient data in the healthcare industry to provide high-quality treatment. Scalable AI systems can manage the intricacies of international operations in the petroleum industry, including market analysis and supply chain logistics.

Research and Innovation: AI encourages innovation by allowing scientists and businesses to investigate uncharted territory. AI helps with medication discovery and the creation of new treatments in the healthcare sector, and it encourages the petroleum business to investigate sustainable practices and new extraction techniques [39].

Prospects for Multidisciplinary Applications in the Future

AI appears to have a bright future in both healthcare and petroleum, with a number of Trans disciplinary applications anticipated in the near future:

Research Collaboration: Researchers from both fields can work together to create AI algorithms that tackle shared issues like data security and privacy. Innovations resulting from this partnership may enhance operational integrity and patient care [40].

Commonly Used Best Practices: There is a chance that best practices and lessons learned can be shared as both businesses continue to use AI technologies. This interaction has the potential to boost AI's efficacy in a variety of fields and hasten its adoption.

Holistic Approaches to Addressing Global Issues: Global issues like environmental sustainability and public health emergencies can be addressed with the help of AI. AI-driven analytics, for example, may track population health trends and evaluate the environmental effects of petroleum operations, resulting in more sustainable practices [41]. AI has significant cross-sector benefits in the healthcare and petroleum industries, providing creative solutions that improve productivity, precision, and judgment. Both businesses can handle their distinct problems while simultaneously gaining from common insights and cooperative methods by utilizing similar AI methodologies. The interdisciplinary uses of AI technologies will open the door to a more sustainable and integrated future as they develop further, improving the overall efficacy of the petroleum and healthcare industries. Organizations hoping to prosper in a world driven by data will need to embrace these developments [42].

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FUTURE PROSPECTS AND DIFFICULTIES OF AI IN PETROLEUM FRAUD DETECTION AND HEALTHCARE

Future uses of artificial intelligence (AI) in healthcare and petroleum fraud detection are expected to develop and change significantly as the technology continues to permeate many industries. To guarantee proper implementation, a number of issues that come with this progression must be resolved. The expected future paths of AI in several fields are examined in this part, along with the obstacles that must be removed in order to reach its full potential [43].

AI's Potential Use in Healthcare

Improved Medical Personalization: More personalization of medical treatments is the direction that AI in healthcare is taking. In order to develop customized treatment regimens, AI technology will progressively examine genetic, environmental, and lifestyle data. This method, which is frequently called precision medicine, enables customized treatments that optimize effectiveness and reduce adverse effects [44]. To improve outcomes, AI-driven platforms might, for instance, utilize genomic data to determine which cancer treatments are best for a certain patient.

Wearable technology with artificial intelligence integration: AI integration with wearable technology will improve health management and patient monitoring as these devices advance. Real-time wearable data analysis by AI algorithms will provide information about patients' health and notify medical professionals of any alarming changes. Hospital admissions could be decreased and chronic illness management greatly enhanced by this ongoing surveillance [45].

AI-Powered Telemedicine with Improved Diagnostics: The COVID-19 epidemic has expedited the growth of telemedicine, which will further benefit from AI applications. Through the analysis of patient data and the provision of diagnostic recommendations based on symptoms reported during virtual visits, artificial intelligence (AI) can support healthcare providers in remote consultations [46]. By guaranteeing that patients receive prompt and precise diagnoses, this technology can improve the standard of care provided remotely.

Clinical Trials with AI: By enhancing patient recruitment and streamlining study designs, artificial intelligence is anticipated to revolutionize clinical trials. Diversity and representation can be improved by using machine learning algorithms to evaluate patient data and find qualified trial candidates. AI is also capable of real-time trial data monitoring, which enables more flexible protocol modifications in response to new information [48].

Better Drug Finding: AI in drug discovery has enormous potential benefits for the pharmaceutical sector. Large datasets can be analyzed by AI systems to find possible medication candidates more quickly and affordably. This ability will speed up the creation of novel treatments, especially for complicated illnesses like cancer and neurological conditions [49].

FUTURE PROSPECTS OF AI IN THE IDENTIFICATION OF PETROLEUM FRAUD

Superior Anomaly Identification: The creation of increasingly complex anomaly detection algorithms is the key to the future of AI in petroleum fraud detection. These algorithms will use cutting-edge machine learning methods, such deep learning, to find intricate patterns in transactional data that might point to fraud [50]. These computers will get better at spotting minute indications of fraud by continuously learning from fresh data.

Predictive Risk Evaluation: AI will improve predictive analytics skills, enabling businesses to evaluate fraud risk instantly. AI can give businesses practical insights to put preventive measures in place before fraud happens by evaluating historical data and identifying risk variables linked to fraudulent activity. Financial integrity and regulatory compliance will both be enhanced by this proactive strategy [51].

Block chain Technology Integration: Fraud detection in the petroleum industry could be completely transformed by the combination of block chain technology and artificial intelligence. The decentralized and unchangeable characteristics of block chain technology can improve data traceability and transparency. Block chain data may be analyzed by AI to find anomalies and trends, giving transactions a more secure and dependable foundation [52].

Cooperation throughout the Sector: Future AI fraud detection systems will probably require cooperation from corporations, technology suppliers, and regulatory agencies in the petroleum sector. By exchanging information and insights, industry-wide fraud detection standards can be created, strengthening the fight against dishonest behavior [53].

Obstacles to Surmount

Fairness and Bias in AI Models: Biases in training data may be unintentionally reinforced by AI systems, producing unfair results. This could lead to differences in treatment recommendations in the healthcare industry, and biased algorithms could mistakenly identify normal transactions as fraudulent in the petroleum fraud detection industry. To reduce these dangers, it is crucial to make sure AI models are transparent and equitable [54].

Connecting Legacy Systems: It can be difficult to integrate AI technologies with current legacy systems in both industries. In order for employees to use new AI tools efficiently, organizations need to spend in training them and deal with compatibility difficulties [55]. To optimize AI's benefits without interfering with ongoing operations, a systematic strategy to integration is necessary.

Adherence to Regulations: The changing regulatory environment around AI presents difficulties for its application in the petroleum and healthcare industries. Businesses need to be aware of how regulations are evolving and make sure their AI applications adhere to moral and legal requirements. In the healthcare industry, where patient safety and data privacy are of utmost importance, this is especially crucial [56].

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CONCLUSION

An important development that has the potential to significantly alter both the healthcare and petroleum fraud detection sectors is the incorporation of artificial intelligence (AI). It is clear from this investigation that AI technologies are revolutionary agents rather than just tools that may improve decision-making, increase operational effectiveness, and ultimately benefit both businesses and patients. AI applications in the healthcare industry, such IBM Watson for Oncology, Google DeepMind's eye disease diagnosis, and PathAI, demonstrate how machine learning and data analytics have the potential to completely transform patient care. These developments make it possible for medical practitioners to offer individualized care, increase the precision of diagnoses, and optimize workflows. The future of healthcare appears increasingly bright as AI develops further, with wearable technologies providing real-time monitoring, improved precision treatment, and expedited drug discovery procedures. To fully utilize AI in healthcare, however, a number of obstacles must be overcome, such as algorithmic bias, data privacy issues, and the requirement for regulatory compliance.

Similarly, AI-driven fraud detection systems put in place by big businesses like Shell, BP, and Equinor are causing a big change in the petroleum sector. These companies use machine learning algorithms and advanced analytics to monitor supply chains, identify irregularities in transaction data, and efficiently evaluate risks. These AI solutions improve financial integrity, operational transparency, and regulatory compliance by proactively detecting fraudulent activity. There is potential for further enhancing security and accountability in the industry through the combination of blockchain technology and artificial intelligence. However, the sector still faces issues with data quality, ethical issues, and the requirement for ongoing AI system learning and development. Looking ahead, it is evident that a concentrated effort to create strong frameworks that put data quality, stakeholder engagement, and ethical norms first will be necessary for the successful application of AI in both healthcare and petroleum fraud detection. While making sure AI systems are created and used ethically, organizations must be dedicated to promoting an innovative culture.

The case studies and observations included in this article highlight the substantial influence of AI on a variety of industries. AI technology' cross-sector benefits and reciprocal advantages underscore the possibility of interdisciplinary cooperation that can spur revolutionary transformation. Organizations can successfully negotiate the complexity of the contemporary environment by adopting these innovations, which will ultimately improve patient care, operational integrity, and service delivery. As we continue to investigate AI's possibilities, the knowledge gained from these applications will open the door for new developments that can tackle the changing problems facing the healthcare and oil sectors, resulting in a more effective, open, and just future.

REFERENCES

1. Lodhi, S. K., Hussain, H. K., & Hussain, I. (2024). Using AI to Increase Heat Exchanger Efficiency: An Extensive Analysis of Innovations and Uses. *International Journal of Multidisciplinary Sciences and Arts, 3(4), 1-14.*
2. R. Jurowetzki, “Unpacking big systems–natural language processing meets network analysis. A study of smart grid development in denmark.” A Study of Smart Grid Development in Denmark. (May 21, 2015). SWPS, vol. 15, 2015.
3. Lodhi, S. K., Gill, A. Y., & Hussain, I. (2024). AI-Powered Innovations in Contemporary Manufacturing Procedures: An Extensive Analysis. *International Journal of Multidisciplinary Sciences and Arts, 3(4), 15-25.*
4. L. Cheng and T. Yu, “A new generation of ai: A review and perspective on machine learning technologies applied to smart energy and electric power systems,” International Journal of Energy Research, vol. 43, no. 6, pp. 1928–1973, 2019.
5. M. Akhloufi and N. Benmesbah, “Outdoor ice accretion estimation of wind turbine blades using computer vision,” in 2014 Canadian Conference on Computer and Robot Vision. IEEE, 2014, pp. 246–253
6. Vinhas, R.; Mendes, R.; Fernandes, A. R.; Baptista, P. V. Nanoparticles Emerging Potential for Managing Leukemia and Lymphoma. Front Bioeng Biotechnol 2017, 5, 79.
7. Mekseriwattana, W.; Thiangtrongjit, T.; Reamtong, O.; Wongtrakoongate, P.; Katewongsa, K. P. Proteomic Analysis Reveals Distinct Protein Corona Compositions of Citrate-and RiboflavinCoated SPIONs. ACS Omega 2022, 7 (42), 37589−37599.
8. Fu, Z.; Xiang, J. Aptamer-Functionalized Nanoparticles in Targeted Delivery and Cancer Therapy. Int. J. Mol. Sci. 2020, 21 (23), 9123.
9. Wu, X.; Chen, J.; Wu, M.; Zhao, J. X. Aptamers: Active Targeting Ligands for Cancer Diagnosis and Therapy. Theranostics 2015, 5 (4), 322.
10. Zhang, L.; Radovic-Moreno, A. F.; Alexis, F.; Gu, F. X.; Basto, P. A.; Bagalkot, V.; Jon, S.; Langer, R. S.; Farokhzad, O. C. Codelivery of Hydrophobic and Hydrophilic Drugs from NanoparticleAptamer Bioconjugates. ChemMedChem: Chemistry Enabling Drug Discovery 2007, 2 (9), 1268−1271. (161)

E-ISSN : 2962-1658
Volume 3, Number 4 , October , 2024
https://doi.org/10.47709/ijmdsa

11. Aravind, A.; Varghese, S. H.; Veeranarayanan, S.; Mathew, A.; Nagaoka, Y.; Iwai, S.; Fukuda, T.; Hasumura, T.; Yoshida, Y.; Maekawa, T.; Kumar, D. S. Aptamer-Labeled PLGA Nanoparticles for Targeting Cancer Cells. Cancer Nanotechnol 2012, 3 (1), 1−12.
12. N. E. Services. Energy theft and fraud reduction. Https: //www.smart-energy.com/industry-sectors/energy-grid-management/ energy-theft-and-fraud-reduction/, last accessed on 02/11/21
13. Husnain, A., Alomari, G., & Saeed, A. AI-Driven Integrated Hardware and Software Solution for EEG-Based Detection of Depression and Anxiety.
14. B. L. Lee, C. Wilson, P. Simshauser, and E. Majiwa, "Deregulation, efficiency and policy determination: An analysis of australia's electricity distribution sector," Energy Economics, p. 105210, 2021.
15. Zeb, S., Nizamullah, F. N. U., Abbasi, N., & Fahad, M. (2024). AI in Healthcare: Revolutionizing Diagnosis and Therapy. *International Journal of Multidisciplinary Sciences and Arts*, *3*(3).
16. J. D. Hunt, E. Byers, Y. Wada, S. Parkinson, D. E. Gernaat, S. Langan, D. P. van Vuuren, and K. Riahi, "Global resource potential of seasonal pumped hydropower storage for energy and water storage," Nature communications, vol. 11, no. 1, pp. 1–8, 2020
17. Zeb, S., Nizamullah, F. N. U., Abbasi, N., & Qayyum, M. U. (2024). Transforming Healthcare: Artificial Intelligence's Place in Contemporary Medicine. *BULLET: Jurnal Multidisiplin Ilmu*, *3*(4).
18. T. Azar, A. Khamis, N. A. Kamal, and B. Galli, "Short term electricity load forecasting through machine learning," in Joint European-US Workshop on Applications of Invariance in Computer Vision. Springer, 2020, pp. 427–437.
19. Lodhi, S. K., Hussain, I., & Gill, A. Y. (2024). Artificial Intelligence: Pioneering the Future of Sustainable Cutting Tools in Smart Manufacturing. *BIN: Bulletin of Informatics, 2(1), 147-162*.
20. Gonsalves T. The summers and winters of artificial intelligence. In: Advanced methodologies and technologies in artificial intelligence, computer simulation, and human-computer interaction. IGI Global. 2019; 168–179.
21. Gurman M. Apple accelerates work on car project, aiming for fully autonomous vehicle; 2021. Available:https://www.bloomberg.com/new s/articles/2021-11-18/apple-accelerateswork-on-car-aims-for-fully-autonomousvehicle
22. IBM: Quantum computing; 2022. Available:https://research.ibm.com/quantu m-computing 17. Ireland C. Alan Turing at 100; 2012. Available:https://news.harvard.edu/gazette/ story/2012/09/alan-turing-at-100
23. Abbasi, N., Nizamullah, F. N. U., & Zeb, S. (2023). AI in Healthcare: Integrating Advanced Technologies with Traditional Practices for Enhanced Patient Care. *BULLET: Jurnal Multidisiplin Ilmu*, *2*(3), 546-556.
24. F. Leach, G. Kalghatgi, R. Stone, and P. Miles, "The scope for improving the efficiency and environmental impact of internal combustion engines," Transportation engineering, p. 100005, 2020.
25. Abbasi, N., Nizamullah, F. N. U., & Zeb, S. (2023). AI IN HEALTHCARE: USING CUTTING-EDGE TECHNOLOGIES TO REVOLUTIONIZE VACCINE DEVELOPMENT AND DISTRIBUTION. *JURIHUM: Jurnal Inovasi dan Humaniora*, *1*(1), 17-29.
26. Valli, L. N. (2024). A succinct synopsis of predictive analytics for fraud detection and credit scoring in BFSI. *JURIHUM: Jurnal Inovasi dan Humaniora*, *2*(2), 200-213.
27. S. Wang, D. Wang, Z. Yu, X. Dong, S. Liu, H. Cui, and B. Sun, "Advances in research on petroleum biodegradability in soil," Environmental Science: Processes & Impacts, vol. 23, no. 1, pp. 9–27, 2021
28. Lashari, Z. A., Lalji, S. M., Ali, S. I., Kumar, D., Khan, B., & Tunio, U. (2024). Physiochemical analysis of titanium dioxide and polyacrylamide nanofluid for enhanced oil recovery at low salinity. *Chemical Papers*, *78*(6), 3629-3637.
29. Hussain, S. M. Arif, and M. Aslam, "Emerging renewable and sustainable energy technologies: State of the art," Renewable and Sustainable Energy Reviews, vol. 71, pp. 12–28, 2017
30. Mehta, A., Niaz, M., Uzowuru, I. M., & Nwagwu, U. Implementation of the Latest Artificial Intelligence Technology Chatbot on Sustainable Supply Chain Performance on Project-Based Manufacturing Organization: A Parallel Mediation Model in the American Context.
31. S. Cao, Y. Chen, G. Cheng, F. Du, W. GAO, Z. He, S. Li, S. Lun, H. Ma, Q. Su et al., "Preliminary study on evaluation of smart-cities technologies and proposed uv lifestyles," in 2018 4th International Conference on Universal Village (UV). IEEE, 2018, pp. 1–49
32. Jamal, A. (2023). Novel Approaches in the Field of Cancer Medicine. *Biological times*, *2*(12), 52-53.
33. Valli, L. N. (2024). Predictive Analytics Applications for Risk Mitigation across Industries; A review. *BULLET: Jurnal Multidisiplin Ilmu*, *3*(4), 542-553.
34. Kejriwal M. Domain-specific knowledge graph construction. Springer; 2019. 19. Kejriwal M, Knoblock CA, Szekely P. Knowledge graphs: Fundamentals, techniques, and applications. MIT Press; 2021.

E-ISSN : 2962-1658
Volume 3, Number 4 , October , 2024
https://doi.org/10.47709/ijmdsa

35. Ruff KM, Pappu RV. Alphafold and implications for intrinsically disordered proteins. Journal of Molecular Biology. 2021; 433.
36. Hamid S. The opportunities and risks of artificial intelligence in medicine and healthcare; 2016. Available: http://www.cuspe.org/wpcontent/uploads/2016/09/Hamid_2016.pdf Access on 2020 May 29.
37. Secinaro S, Calandra D, Secinaro A, Muthurangu V, Biancone P. Artificial Intelligence for healthcare with a business, management and accounting, decision sciences, and health professions focus. Zenodo; 2021. Available:https://zenodo.org/record/458761 8#.YEScpl1KiWh Access on 2021 Mar 7.
38. Jacoby WG. Electoral inquiry section loess: A nonparametric, graphical tool for depicting relationships between variables q. In; 2000.
39. Lodhi, S. K., Hussain, H. K., & Gill, A. Y. (2024). Renewable Energy Technologies: Present Patterns and Upcoming Paths in Ecological Power Production. *Global Journal of Universal Studies*, *1*(1), 108-131.
40. Casadesus-Masanell R, Ricart JE. How to design a winning business model. Harvard Business Review; 2011. Available: https://hbr.org/2011/01/how-todesign-a-winning-business-model Access on 2020 Jan 8.
41. Baima G, Forliano C, Santoro G, Vrontis D. Intellectual capital and business model: A systematic literature review to explore their linkages. J Intellect Cap; 2020. Available:https://doi.org/10.1108/JIC-02- 2020-0055
42. Choudhary, V., Mehta, A., Patel, K., Niaz, M., Panwala, M., & Nwagwu, U. (2024). Integrating Data Analytics and Decision Support Systems in Public Health Management. *South Eastern European Journal of Public Health*, 158-172.
43. Lodhi, S. K., Gill, A. Y., & Hussain, I. (2024). 3D Printing Techniques: Transforming Manufacturing with Precision and Sustainability. *International Journal of Multidisciplinary Sciences and Arts*, *3*(3), 129-138.
44. U. of Haifa. Exposure to 'white' light leds appears to suppress body's production of melatonin more than certain other lights, research suggests. https://www.sciencedaily.com/releases/2011/ 09/110912092554.htm, last accessed on 04/04/21.
45. Lodhi, S. K., Gill, A. Y., & Hussain, H. K. (2024). Green Innovations: Artificial Intelligence and Sustainable Materials in Production. *BULLET: Jurnal Multidisiplin Ilmu*, *3*(4), 492-507.
46. Lashari, Z. A., Lalji, S. M., Ali, S. I., Kumar, D., Khan, B., & Tunio, U. (2024). Physiochemical analysis of titanium dioxide and polyacrylamide nanofluid for enhanced oil recovery at low salinity. *Chemical Papers*, *78*(6), 3629-3637.
47. Liu, J.; Wei, T.; Zhao, J.; Huang, Y.; Deng, H.; Kumar, A.; Wang, C.; Liang, Z.; Ma, X.; Liang, X.-J. Multifunctional AptamerBased Nanoparticles for Targeted Drug Delivery to Circumvent Cancer Resistance. Biomaterials 2016, 91, 44−56.
48. Yergeri, M.; Kapse-Mistry, S.; Srivastava, R.; Govender, T. Nanodrug Delivery in Reversing Multidrug Resistance in Cancer Cells. Front Pharmacol 2014, 5, 159. (164) Dong, X.; Mumper, R. J. Nanomedicinal Strategies to Treat Multidrug-Resistant Tumors: Current Progress. Nanomedicine 2010, 5 (4), 597−615.
49. Ding, X.; Qin, Y.; Bathini, T.; Hu, S.; Li, X.; Chen, X.; Xing, S.; Tang, L.; Xie, Y.; Mou, S.; Tan, W.; Wang, R. Unlocking the Potential of Pterostilbene: A Pharmaceutical Element for AptamerBased Nanomedicine. ACS Appl. Mater. Interfaces 2024, 16, 14434.
50. Zhou, H.; Li, Y.; Wu, W. Aptamers: Promising Reagents in Biomedicine Application. Adv. Biol. 2024, 2300584
51. Park, Y.; Hong, M.-S.; Lee, W.-H.; Kim, J.-G.; Kim, K. Highly Sensitive Electrochemical Aptasensor for Detecting the VEGF165 Tumor Marker with PANI/CNT Nanocomposites. Biosensors (Basel) 2021, 11 (4), 114.
52. Vacek, J.; Zatloukalová, M.; Dorcák,ˇ V.; Cifra, M.; Futera, Z.; Ostatná, V. Electrochemistry in Sensing of Molecular Interactions of Proteins and Their Behavior in an Electric Field. Microchimica Acta 2023, 190 (11), 442.
53. Crunchbase: Hugging face - funding, financials, valuation & investors; 2022. Available:https://www.crunchbase.com/org anization/hugging-face/company_financials 5. DARPA: Learning With Less Labeling (LwLL). Available:https://www.darpa.mil/program/le arning-with-less-labeling
54. DARPA: Low resource languages for emergent incidents (LORELEI). Available:https://www.darpa.mil/program/lo w-resource-languages-for-emergentincidents
55. Foundation NS. About America's seed fund powered by NSF; 2022. Available:https://seedfund.nsf.gov/about
56. Frank A. Are we in an AI summer or AI winter? 2021. Available: https://bigthink.com/13-8/arewe-in-an-ai-summer-or-ai-winter