AlgoVista: Journal of AI & Computer Science

Volume 2, Issue 3, Year 2025
Emerging Technologies in AI and Machine Learning
ISSN: 3079-5338

Dual Applications of AI in Healthcare: Enhancing Petroleum Fraud Detection and Pioneering Cancer Therapies

Mohammad Ali[1*]
[1]Independent Researcher Iraq
[1]m.ali.m2000m@gmail.com

Abstract

Artificial intelligence (AI) is developing at a rapid pace, offering revolutionary possibilities in a number of fields, most notably cancer treatment and petroleum fraud detection. The dual uses of AI are examined in this study, which shows how advanced techniques like data mining, machine learning, and predictive analytics may boost operational effectiveness and better patient outcomes. Artificial intelligence (AI) technologies are used in the petroleum industry to detect fraudulent activity, streamline procedures, and uphold compliance, protecting operational dependability and financial integrity. AI also helps cancer medicine by accelerating medication discovery, improving diagnostic precision, and developing tailored treatment plans. The paper emphasizes the linkages between these domains and the opportunities for cooperation and knowledge sharing that might spur creativity. Additionally, the ethical implications of algorithmic bias, transparency, and data privacy are rigorously analyzed, highlighting the necessity of implementing AI responsibly. With expected trends including improved algorithms, increased connectivity to the Internet of Things (IoT), and an emphasis on explain ability, the future of AI in these fields is bright. To fully utilize AI, a call to action is made, asking interested parties to fund research and development, encourage interdisciplinary cooperation, and have ethical conversations. In the end, this paper makes the case that the dual use of AI not only demonstrates the adaptability of technology but also paves the way for a day when AI will significantly enhance operational integrity and health outcomes.

Keywords: Predictive analytics, cancer treatment, machine learning, artificial intelligence, detecting petroleum fraud, data protection.

1. Introduction

Healthcare is one of the industries most affected by artificial intelligence (AI), which is changing many other industries as well. The way medical professionals identify, treat, and manage illnesses is being completely transformed by the incorporation of AI technologies. At the same time, sectors outside of traditional healthcare, like the petroleum industry, are using AI to fight fraud, which has a big impact on their financial stability and operational integrity [1]. This twin use of AI—improving the identification of petroleum fraud and driving the development of cancer treatments—emphasizes the technology's adaptability and potential as a game-changing instrument in a variety of industries [2].

Rapid changes in the healthcare industry have been mostly caused by technological breakthroughs. In particular, artificial intelligence (AI) has become a potent enabler that enables medical practitioners to use enormous volumes of data to make better decisions. Artificial intelligence (AI) systems can evaluate patient data, spot trends, and offer insights that improve therapeutic outcomes by utilizing machine learning algorithms, natural language processing, and data analytics. In a profession as

ISSN: 3079-5338

complicated as healthcare, where timely and accurate information can have a huge impact on patient lives, the ability to handle and comprehend complex datasets is especially important [3]. AI is being used in healthcare in a variety of ways, from predictive analytics that anticipate patient outcomes to diagnostic tools that help interpret medical imaging. For example, artificial intelligence (AI) algorithms have demonstrated exceptional ability to detect anomalies in radiology images, frequently matching or even exceeding human radiologists' accuracy. Furthermore, especially in oncology, AI-driven platforms may evaluate genomic data to create individualized therapy regimens that match patient profiles [4].

AI helps the healthcare sector improve patient care and results, but the petroleum sector faces its own problems, most notably fraud. Petroleum fraud includes a number of illegal practices, such as resource theft, quantity deception, and data manipulation. In addition to causing significant financial losses, these dishonest tactics jeopardize supply chain integrity and regulatory compliance. The intricacy of fraudulent schemes is increasing along with the worldwide need for petroleum, therefore businesses must embrace innovative ways to protect their operations. Petroleum fraud has far-reaching effects on availability, pricing, and even national economies. Therefore, there is an urgent need for cutting-edge solutions that can efficiently identify and stop these fraudulent operations [5]. AI is a tremendous tool in the petroleum industry because of its capacity to instantly scan massive information and spot patterns that could be signs of fraud.

The field of cancer medicine is seeing a boom in novel medicines and treatment approaches at the same time that artificial intelligence is being developed for fraud detection. As one of the world's leading causes of death, cancer requires constant research and development to enhance patient outcomes, treatment regimens, and diagnostic methods. Given the distinct genetic and molecular traits of many cancer kinds, traditional cancer treatment frequently takes a one-size-fits-all strategy, which may not work for every patient [6]. In this field, AI is becoming more widely acknowledged as a game-changer. AI can assist in the discovery of novel biomarkers and therapeutic targets by evaluating data from clinical trials, patient records, and molecular investigations. This will make the creation of tailored medicines easier. Additionally, by optimizing clinical trial designs, AI systems can help researchers find qualified individuals more quickly and hasten the development of viable therapies.

A larger trend of multidisciplinary innovation is highlighted by the convergence of AI applications in cancer care and petroleum fraud detection. The potential for cross-sector collaboration becomes evident as industries become more aware of AI's possibilities [7]. The operational efficiency and integrity of both industries could be improved, for example, by using techniques developed to identify irregularities in petroleum transactions to healthcare data management. This essay will examine these two uses of AI in greater detail, looking at the most recent technological developments, the difficulties encountered in both fields, and the potential for AI-driven solutions to improve healthcare delivery and operational integrity in the petroleum sector in the future. A thorough overview is given in this introduction, laying the groundwork for a more in-depth investigation of AI's application in healthcare and petroleum fraud detection. Please let me know if you require any more sections or information

ISSN: 3079-5338

[8].

2. AI's Function in Identifying Petroleum Fraud

Being the main source of energy and a major force behind industrial expansion, the petroleum sector is essential to the world economy. It is, nevertheless, also vulnerable to many types of fraud, which can result in large monetary losses, fines from the authorities, and harm to one's image. Traditional detection techniques are frequently insufficient to protect against these changing dangers as fraudsters become more skilled [9]. As a result, using artificial intelligence (AI) to detect petroleum fraud has become a crucial tactic for improving financial security and operational integrity.

Knowing the Different Types and Effects of Petroleum Fraud: Fuel theft, measurement manipulation, shipping document falsification, and false claims about product quality are just a few examples of the many ways petroleum fraud can appear. Every kind of fraud has different difficulties and repercussions, frequently leading to financial losses of millions of dollars. For instance, gasoline theft is a common problem that impacts businesses' immediate financial results as well as consumers' costs and governments' tax collections. Petroleum fraud has effects that go beyond financial ones; it can also alter market dynamics and erode public confidence in energy suppliers [10]. Thus, creating reliable detection techniques is crucial to preserving the integrity of the petroleum supply chain and guaranteeing adherence to legal requirements.

AI-Powered Fraud Detection Tools: AI technologies offer strong instruments for improving the petroleum industry's capacity to detect fraud. At the vanguard of these developments are machine learning, data analytics, and pattern recognition, which allow businesses to instantly examine enormous volumes of transactional data. Organizations can spot irregularities and trends suggestive of fraud by using algorithms that learn from past data [11].

Machine Learning Algorithms: To identify patterns and forecast results, machine learning entails training algorithms using past data. These algorithms can examine transactional data, operational indicators, and environmental elements to find anomalies in the context of petroleum fraud detection [12]. Machine learning methods, for instance, can identify anomalous variations in gasoline delivery amounts that might point to theft or manipulation.

Data Analytics and Pattern Recognition: Businesses can find hidden insights by sorting through large databases using sophisticated data analytics tools. Organizations can monitor performance measures and set benchmarks by using statistical analysis and visualization tools, which facilitates the identification of disparities. Non-standard transactional behaviors, including frequent differences between reported and actual delivery quantities, can be identified by pattern recognition algorithms [13].

Case Studies: Effective AI Implementations: Numerous businesses in the petroleum sector have successfully deployed AI-powered fraud detection systems, with encouraging outcomes. For example, a large oil and gas company analyzed transaction data from thousands of fuel distribution stations using machine learning algorithms. The corporation greatly decreased fuel theft incidents by keeping an eye out for odd trends, which resulted in yearly savings of millions. A company that used AI-powered drones with cameras and sensors to keep an eye on pipelines and storage tanks is

 ISSN: 3079-5338

highlighted in another case study [14]. These drones may identify irregularities, such leaks or illegal entry, and notify the operations team in real time, enabling prompt action. This kind of AI integration has reduced losses while improving the infrastructure's overall security.

Obstacles and Restrictions: AI has the ability to detect fraud, but there are still a number of obstacles to overcome. The efficiency of AI applications may be hampered by the difficulty of integrating data from various sources, including sensors, transaction logs, and supply chain management systems [15]. The quality of the data that is given into AI algorithms is very important; erroneous or incomplete data can produce false positives or negatives, which erodes confidence in automated systems. Additionally, competent staff members who can decipher AI-generated insights and take the necessary action are needed. Organizations must spend money on up skilling and training their employees to use AI systems as they become more sophisticated. Maximizing the advantages of AI in petroleum fraud detection requires addressing these issues [16].

As the petroleum business navigates a terrain distinguished by complex problems and evolving dangers, artificial intelligence (AI) plays an increasingly important role in improving the identification of petroleum fraud. Businesses may greatly enhance their capacity to detect and stop fraudulent activity by utilizing machine learning algorithms and sophisticated data analytics. Even though there are obstacles to overcome, the effective application of AI technologies shows how they can improve operational integrity, safeguard financial interests, and advance a safer petroleum sector [17]. The use of AI in fraud detection will probably advance in sophistication as technology develops further, opening the door to even more potent solutions.

3. AI Advances in the Treatment of Cancer

Millions of people die from cancer every year, making it one of the world's most urgent health issues. Because of its complexity—which includes a wide range of forms and unpredictable behavior—new methods of diagnosis, therapy, and patient care are required. At the front of this change is artificial intelligence (AI), which offers instruments that improve our comprehension of cancer biology and maximize treatment approaches. AI speeds up drug discovery, improves diagnostic precision, and enables tailored care by evaluating large datasets—all of which benefit cancer patients in the long run [18]. From early detection to therapy improvement, AI applications in cancer are diverse and multifaceted. By enhancing diagnostic accuracy, forecasting treatment outcomes, and discovering new therapeutic targets, the incorporation of AI technology into clinical practice holds the potential to completely transform the treatment of cancer. As healthcare systems struggle with issues including expanding patient populations, mounting costs, and the requirement for customized treatment plans, this integration is becoming more and more crucial [19].

4. Using Predictive Analytics to Create Tailored Treatment Programs

Predictive analytics is one of the most important developments in cancer care made possible by AI. Clinicians can create individualized treatment regimens by using machine learning algorithms to examine a patient's genetic data, medical history, and reaction to treatment [20].

Analysis of Genomic Data: Artificial intelligence (AI) technologies are highly proficient in processing and interpreting genomic data, which enables a more thorough comprehension of the

ISSN: 3079-5338

genetic alterations causing particular cancer kinds [21]. Algorithms, for instance, can examine Next-Generation Sequencing (NGS) data to find mutations and changes that certain treatments might target. This makes it possible for oncologists to choose the best course of action for each patient according to their distinct genetic profiles.

Patient Risk Assessment: By examining variables including tumor features, treatment history, and demographic data, AI models can also determine the patient's risk of cancer progression or recurrence. Clinicians can enhance outcomes by customizing adjuvant medicines and surveillance regimens by classifying patients into risk groups [22].

5. AI-Powered Drug Development and Discovery

It frequently takes more than ten years and billions of dollars to bring a novel cancer treatment to market due to the infamously drawn-out and costly drug discovery process. This procedure is being streamlined by AI, which helps researchers find promising medication candidates more quickly [23].

Target Identification: By analyzing biological data, AI algorithms are able to find new medication targets, such as certain proteins or pathways implicated in the development of cancer. Researchers can identify previously missed targets by using machine learning models to sort through large biological datasets [24]. High-throughput screening of chemical compounds to determine their efficacy against certain cancer cells can also be made easier by AI technologies. The most promising options for additional testing can be identified by researchers by modeling the interactions of various chemicals with target molecules.

Enhancing Clinical studies: Artificial Intelligence is revolutionizing the planning and conduct of clinical studies. Researchers can increase the effectiveness of clinical trials by employing predictive analytics to estimate possible outcomes, enhance trial designs, and identify appropriate patient populations [25].

6. Using AI to Improve Diagnostic Accuracy

The precision of cancer diagnosis is being greatly increased by AI technologies, which is essential for efficient treatment planning.

Medical Imaging: To improve the interpretation of medical images like mammograms, CT scans, and MRIs, radiologists are using AI algorithms more and more. A subset of artificial intelligence called deep learning models has shown impressive accuracy in identifying cancers and other anomalies, frequently surpassing human radiologists in this regard [26]. Early cancer identification is essential for effective therapy, and these algorithms can identify small abnormalities in imaging data [27].

Pathology: By helping to analyze tissue samples, AI systems can help pathologists more precisely identify malignant cells. AI-powered image analysis can measure characteristics like cellular shape and tumor size, offering important information that helps with diagnostic and treatment choices [28].

Volume 2, Issue 3, Year 2025
Emerging Technologies in AI and Machine Learning
ISSN: 3079-5338

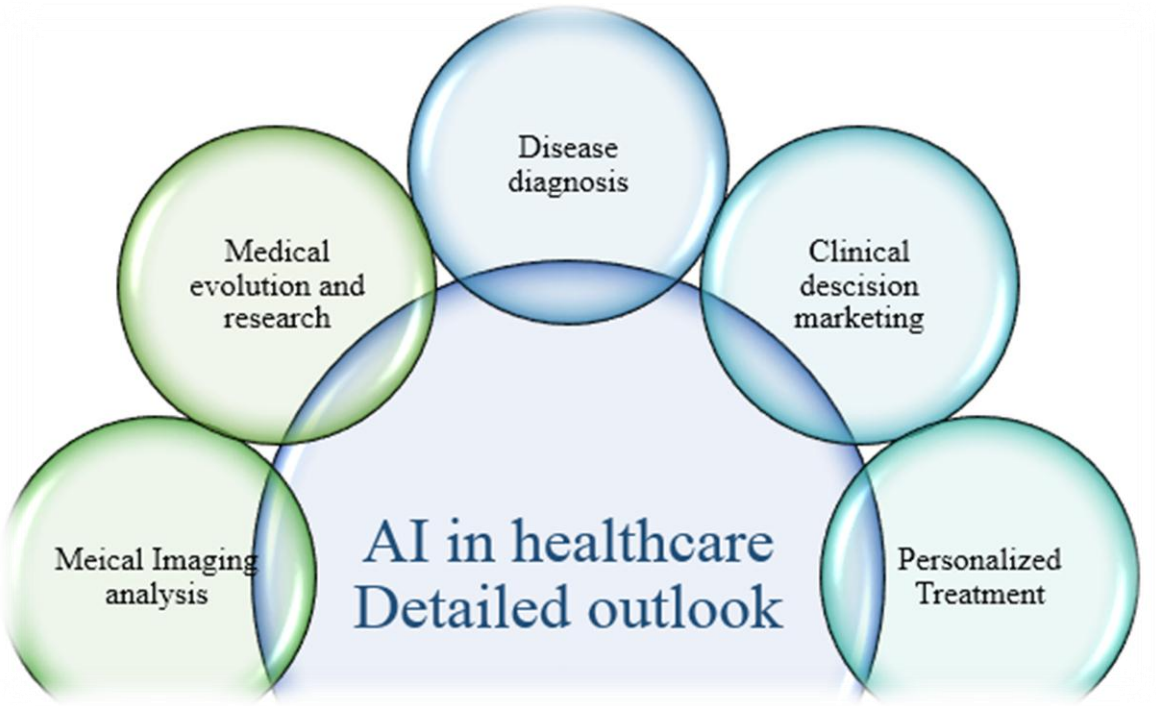

Figure: 1 showing detailed outlook of AI in healthcare

7. New Technologies: Biomarkers and Imaging

AI's application in oncology is expanding beyond drug development and diagnostic imaging to include the finding of biomarkers that might inform therapy choices. When assessing a patient's response to a particular treatment, biomarkers—biological signs of disease—are essential [28].

Biomarker Discovery: AI systems are able to examine multi-omics data, including proteomics, metabolomics, and genomes, in order to find possible biomarkers linked to the course of a disease or its response to treatment. This feature makes it possible to create companion diagnostics that can forecast a patient's response to a specific treatment [29].

Real-Time Monitoring: Wearable technology and smartphone apps are enabling real-time cancer patient monitoring thanks to AI technologies. By monitoring symptoms, adverse effects, and treatment outcomes, these instruments give medical professionals useful information to modify treatment regimens as necessary. The field of oncology is changing as a result of AI advancements in cancer medicine, which present new chances for individualized care, improved diagnostic precision, and quicker medication discovery. Healthcare professionals can improve patient outcomes by using machine learning algorithms, predictive analytics, and advanced imaging technology to make better judgments [30]. AI will probably become more deeply incorporated into cancer care as it develops, opening the door to more individualized and efficient strategies for treating this complicated illness. To fully realize AI's potential to transform cancer medicine, oncologists, biomedical engineers, and AI researchers must continue their partnership.

Volume 2, Issue 3, Year 2025
Emerging Technologies in AI and Machine Learning
ISSN: 3079-5338

8. Relationships between Cancer Medicine and Petroleum Fraud Detection

Applications of artificial intelligence (AI) in a variety of industries are revealing unexpected links and knowledge-sharing opportunities as the technology develops. The methods used to detect petroleum fraud and advancements in cancer treatment, in particular, make a strong argument for cross-industry learning. We can learn a great deal about how AI can be used in both domains by looking at the parallels between data analysis, predictive modeling, and pattern recognition [31]. This section examines the common technology and approaches, identifies possible lessons from other industries, and discusses the moral issues raised by the application of AI in these various fields.

AI Techniques and Technologies That Are Shared

AI technologies like machine learning, data mining, and advanced analytics are beneficial to both the petroleum sector and cancer treatment. Although the context of their uses may vary, the fundamental ideas are always the same [32].

Machine Learning: To find patterns and forecast results, machine learning algorithms are employed to process massive amounts of data in both industries. Machine learning, for example, may examine transactional data to find irregularities suggestive of fraud in the petroleum industry. Similar to this, machine learning models are used in cancer care to tailor treatment by analyzing patient data, genomic information, and treatment responses [33].

Data Mining: To find hidden patterns in large datasets, data mining techniques are essential in both domains. In oncology, data mining can reveal associations between particular biomarkers and treatment effectiveness, while in petroleum fraud detection, it can find disparities in fuel transactions. Professionals in these fields may make data-driven decisions that improve patient care and operational efficiency by having the ability to sort through complicated datasets. Predictive modeling is an essential part of cancer treatment planning as well as the detection of petroleum fraud. Using past data and present patterns, predictive models in the petroleum industry can estimate the probability of fraudulent conduct [34]. Predictive models in cancer medicine use a patient's genetic profile and past clinical results to forecast how the patient will react to treatment. The possibility for reciprocal learning and technique adaptation is highlighted by the shared emphasis on prediction.

Cross-Sector Collaborations and Learnings

Cross-industry collaborations that potentially improve AI applications in both cancer therapy and petroleum fraud detection are made possible by the ties between these two sectors.

Anomaly Detection: Methods like anomaly detection algorithms that were created for petroleum fraud detection can be modified to find odd trends in patient data related to cancer. AI programs that track how well a medication is working, for instance, may identify unanticipated side effects or subpar results and encourage more research [35].

Volume 2, Issue 3, Year 2025
Emerging Technologies in AI and Machine Learning
ISSN: 3079-5338

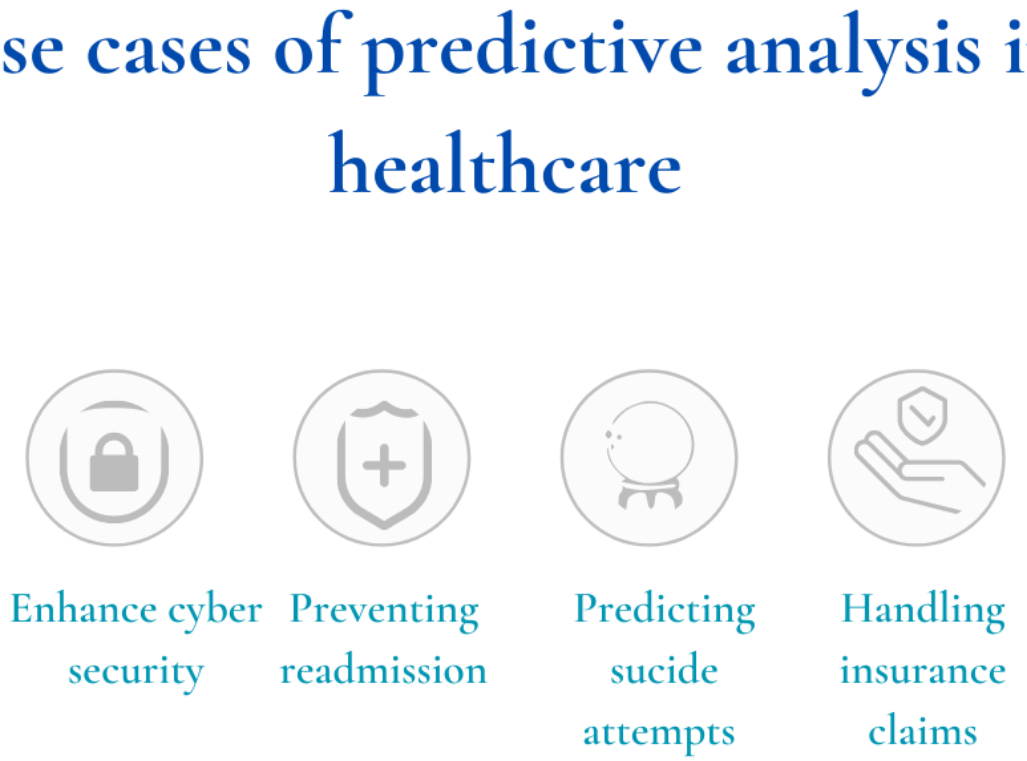

Figure: 2 showing use cases of predictive analysis in healthcare

Data Standardization: The integration and standardization of data provide difficulties for both businesses. The healthcare industry's efforts to standardize electronic health records (EHRs) in order to guarantee that data is accessible and consistent can teach the petroleum business a few things [36]. To develop a more thorough picture of patient care, the healthcare industry can then apply some of the techniques employed in the petroleum industry to integrate different data sources, such as IoT devices and transactional systems.

Partnership with Tech Companies: To create cutting-edge AI fraud detection solutions, the petroleum sector has progressively teamed up with tech companies. Partnerships with digital businesses can speed up the development of AI applications in cancer medicine, reflecting this collaborative model in the healthcare industry [37]. Stakeholders may create stronger solutions that tackle difficult problems by utilizing knowledge from both fields.

9. AI Applications with Ethical Considerations

Ethical issues must be at the forefront of conversations as AI technologies continue to enter the healthcare and petroleum sectors.

Data Security and Privacy: Managing private patient information presents serious privacy issues in the healthcare industry. Additionally, the petroleum industry handles sensitive transactional data that might cause serious financial and reputational harm if compromised. For all businesses, creating strong data governance structures that put security and privacy first is crucial [38].

Fairness and Bias: AI systems are vulnerable to biases in training data, which may produce unjust

ISSN: 3079-5338

results. While biased detection systems in petroleum may unjustly target particular regions or groups, biased algorithms in cancer medicine may lead to unequal access to therapies or misdiagnoses [39]. Thorough testing and validation procedures are necessary to reduce bias and guarantee fairness in AI systems.

Accountability and Transparency: In both fields, AI decision-making must be transparent. Understanding how AI models make decisions is crucial for stakeholders, especially when those decisions have an effect on patient care or financial integrity. Building trust with stakeholders and users in the healthcare and petroleum industries can be facilitated by the development of explainable AI systems. The potential for cross-disciplinary learning and innovation is highlighted by the ties between cancer medicine and petroleum fraud detection. Both disciplines can increase operational efficiency and improve results by utilizing common AI technologies and approaches. Collaboration opportunities and a dedication to ethical principles can result in AI applications that are more efficient and just. In order to advance and improve outcomes for all parties involved, it will be crucial to integrate insights and practices from one industry to another as industries embrace AI's potential more and more [40].

10.Prospects for the Future

Artificial intelligence (AI) in cancer treatment and petroleum fraud detection is expected to make significant strides in the future because to ongoing research, technical innovation, and a growing dependence on data-driven decision-making. The application of AI offers tremendous potential to boost operational effectiveness, increase patient outcomes, and address new trends as industries struggle with intricate problems and changing demands [41]. This section examines the possible applications of AI in different healthcare domains, the expected developments in AI technology, and suggestions for practitioners and policymakers.

Improved Algorithms and Models: One of the main trends in AI applications for cancer treatment and petroleum fraud detection will be the creation of increasingly complex algorithms. More accurate predictions and insights are anticipated from advanced machine learning models, such as deep learning and reinforcement learning. Better anomaly detection in petroleum transactions and improved patient classification in cancer treatment will be made possible by these algorithms' ability to handle more complex information [42].

AI and IoT Integration: Data collection and analysis in both industries will undergo a radical change as a result of the convergence of AI and the Internet of Things (IoT). IoT tools like smart sensors and drones can track data from pipelines and storage facilities in real time, allowing for the quick detection of anomalies or possible fraud in the petroleum industry [43]. Wearable technology can continuously monitor patient metrics in the healthcare industry, giving AI systems real-time data to enhance treatment strategies and enhance results.

Natural Language Processing (NLP): In both domains, NLP technology will be crucial for drawing insightful conclusions from unstructured data. NLP may examine contracts, transaction records, and regulatory papers in the petroleum industry to find possible fraud or compliance problems. NLP can be used to evaluate research papers and clinical notes in cancer medicine, which helps find new

 ISSN: 3079-5338

treatment plans and clinical trial chances [44].

Increased Focus on Explain ability: The development of explainable AI systems will be given more attention as AI is incorporated more and more into crucial decision-making procedures. The transparency of AI models' decision-making processes will be demanded by stakeholders in the healthcare and petroleum industries [45]. Users' trust will grow as a result of this transparency, which will also assist AI technology become more widely accepted.

11.AI's Potential in Other Healthcare Domains

Although this article has focused on cancer medicine, there are numerous other healthcare domains where AI technologies could be used, such as:

Management of Chronic Diseases: AI has the potential to be extremely helpful in the treatment of long-term illnesses like diabetes and heart disease. AI systems can forecast the course of a disease, customize treatment regimens, and improve patient adherence to treatments by evaluating patient data [46].

Telemedicine and remote monitoring: As telemedicine gains traction, there are chances for AI to improve virtual consultations and remote patient monitoring. Chatbots and virtual assistants driven by AI can give patients quick information and assistance, increasing access to medical services [47].

Mental Health: With technologies that examine speech patterns, social media activity, and wearable device data to identify indicators of mental health disorders, artificial intelligence (AI) applications in mental health care are growing [48]. Customized treatment plans and early interventions may be made possible by these findings.

Public Health Surveillance: By evaluating big datasets to instantly spot trends, outbreaks, and risk factors, artificial intelligence (AI) can improve public health operations. In the context of worldwide health emergencies like pandemics, this competence is especially pertinent [49].

12.Suggestions for Practitioners and Policymakers

As AI's application in cancer treatment and petroleum fraud detection develops further, policymakers and practitioners should take into account the following suggestions:

Invest in Research and Development: Funding for studies that investigate novel AI applications and technology should be given top priority by governments and organizations [50]. Innovative solutions can be developed more quickly when industry, academia, and regulatory agencies work together.

Create Regulatory Frameworks: To guarantee safety, effectiveness, and moral application, precise regulatory requirements for AI applications in both industries must be established. Policymakers ought to involve stakeholders in the creation of these frameworks in order to solve issues with accountability, bias, and data privacy [51].

Encourage Interdisciplinary Collaboration: Fostering cooperation among many industries, including healthcare, technology, and energy, can help to exchange knowledge and spur innovation. Collaborations across industries can result in the creation of AI solutions that tackle difficult problems in both domains [52].

Emphasis on Education and Training: Professionals with expertise in AI applications will be in

 ISSN: 3079-5338

more demand as AI technology proliferate. To equip the workforce of the future to handle the changing environment, educational institutions should modify their curricula to incorporate training in AI and data science [53].

Engage Stakeholders in Ethical Discussions: To guarantee that AI applications are created and used ethically, it is important to involve a variety of stakeholders in conversations regarding the ethical implications of AI, including patients, business executives, ethicists, and legislators. Future prospects for AI in cancer treatment and petroleum fraud detection are bright, marked by notable technical developments and growing chances for inter-sector cooperation. Both industries can increase operational effectiveness and improve patient outcomes by utilizing common insights and innovations. Realizing the full potential of AI applications in these crucial fields will need a dedication to ethical considerations, education, and interdisciplinary collaboration as stakeholders traverse the rapidly changing AI landscape [54]. Policymakers and practitioners can help create a future where artificial intelligence (AI) significantly advances healthcare and maintains operational integrity in the petroleum sector by adopting these ideas.

13.Conclusion

Artificial intelligence's (AI) quick development is radically changing businesses by offering creative solutions that improve productivity, precision, and judgment. This dual use of AI in cancer treatment and petroleum fraud detection demonstrates how revolutionary technology can be in solving difficult problems in a variety of domains. The connections between these industries, as discussed in this article, highlight the value of cooperation and ethical considerations going forward in addition to highlighting similarities in the application of AI. Investigating AI applications in petroleum fraud detection demonstrates how the technology can evaluate enormous datasets, spot irregularities, and streamline operational procedures. Advanced machine learning algorithms and data analytics can be extremely helpful to the petroleum business, which is frequently beset by problems like fuel theft and measurement manipulation. Businesses can lower financial losses, improve compliance, and preserve operational integrity by putting AI-driven solutions into place.

AI is also transforming patient care in cancer medicine through enhanced diagnostic precision, predictive analytics, and tailored therapy plans. Healthcare professionals can deliver individualized treatments that take into account the particulars of each patient's cancer by utilizing genomic data and cutting-edge imaging technologies. AI integration improves patient outcomes by facilitating early identification and prompt intervention, in addition to speeding up the drug research and clinical trial processes. The linkages between these two fields imply that approaches and technology created in one can be successfully modified to solve problems in the other. For example, predictive modeling frameworks developed in the healthcare industry can guide risk assessment procedures in the energy sector, while anomaly detection techniques used in petroleum fraud detection can be reused to find odd patterns in patient treatment reactions.

Addressing the ethical issues that come up when AI is used is crucial as we embrace its potential. To gain the trust of stakeholders, concerns including algorithmic bias, data privacy, and the requirement for openness must be given top priority. The interests of patients, customers, and business experts

ISSN: 3079-5338

will all be protected if AI systems are developed and used properly. Regulatory agencies, ethical committees, and technology developers will need to work together to build frameworks that support accountability, transparency, and equity in AI applications. In order to fully utilize AI in the future, it is imperative that those involved in the healthcare and petroleum sectors move pro-actively. The following crucial steps can help to speed up this process Funding for AI research projects that investigate novel uses and tackle current issues should be given top priority by policymakers and business executives. Working together on research projects can lead to developments that are advantageous to both industries and promote an innovative atmosphere. New AI solutions that tackle challenging issues can be developed by fostering collaborations across a range of industries, such as technology, healthcare, and energy. Stakeholders can develop synergies that boost operational effectiveness and promote patient outcomes by exchanging knowledge and skills.

It's critical to set precise rules governing the application of AI in healthcare and petroleum fraud detection. These frameworks should prioritize data security, privacy, and ethical considerations to ensure that AI applications serve the public good. To prepare the workforce for the future, educational institutions should incorporate AI and data science training into their curricula. By equipping the next generation of professionals with the skills needed to navigate the evolving landscape, we can foster a more capable workforce ready to tackle the challenges of tomorrow. It is vital to involve a diverse range of stakeholders—including patients, industry experts, and ethicists—in discussions surrounding the ethical implications of AI. These conversations will help identify potential risks and ensure that AI technologies are developed and implemented in a way that is equitable and just.

The potential of AI to revolutionize both the petroleum and healthcare sectors is immense, and the time to act is now. By fostering collaboration, investing in research, and prioritizing ethical considerations, we can unlock the full benefits of AI applications. The journey towards a future enriched by AI requires a collective commitment to innovation, responsibility, and integrity. The dual application of AI in petroleum fraud detection and cancer medicine offers a compelling narrative of how technology can drive progress across industries. By embracing these opportunities and addressing the challenges ahead, we can shape a future where AI serves as a powerful tool for enhancing operational integrity and improving health outcomes. Stakeholders from all sectors must come together to seize this moment, ensuring that the promise of AI translates into real-world benefits for society as a whole.

References

[1]. S. Liu, R. Shi, Y. Huang, X. Li, Z. Li, L. Wang, D. Mao, L. Liu, S. Liao, M. Zhang, G. Yan, and L. Liu, ‘‘A data-driven and data-based framework for online voltage stability assessment using partial mutual information and iterated random forest,’’ Energies, vol. 14, no. 3, p. 715, Jan. 2021

[2]. N. A. M. Kamari, I. Musirin, A. A. Ibrahim, and S. A. Halim, ‘‘Intelligent swarm-based optimization technique for oscillatory stability assessment in power system,’’ IAES Int. J. Artif. Intell., vol. 8, no. 4, p. 342, Dec. 2019.

[3]. N. Amjady and F. Fallahi, ‘‘Determination of frequency stability border of power system to set the thresholds of under frequency load shedding relays,’’ Energy Convers. Manage. vol. 51, no. 10, pp. 1864–1872, Oct. 2010.

[4]. Z. El Mrabet, N. Kaabouch, H. El Ghazi, and H. El Ghazi, ‘‘Cybersecurity in smart grid: Survey and challenges,’’ Comput. Elect. Eng., vol. 67, pp. 469–482, Apr. 2018.

[5]. J. Wu, K. Ota, M. Dong, J. Li, and H. Wang, ‘‘Big data analysis-based security situational awareness for smart grid,’’ IEEE Trans. Big Data., vol. 4, no. 3, pp. 408–417, Sep. 2016.

[6]. Y. Zhang and J. Yan, ‘‘Semi-supervised domain-adversarial training for intrusion detection against false data injection in the smart grid,’’ in Proc. Int. Joint Conf. Neural Netw. (IJCNN), Jul. 2020, pp. 1–7.

[7]. Malik FS, Sahibzada S, Nasir S, Lodhi SK. Machine Learning-Enhanced Turbulence Prediction and Flow Optimization for Advanced Aerodynamic Design in High-Speed Regimes. European Journal of Science, Innovation and Technology. 2024; 4(6):39-46.

[8]. Nasir S, Zainab H, Hussain HK. Artificial-Intelligence Aerodynamics for Efficient Energy Systems: The Focus on Wind Turbines. BULLET: Jurnal Multidisiplin Ilmu. 2024; 3(5):648-59.

[9]. Khan M, Sherani AM. Healthcare Meets AI: Innovations, Applications, and Ethical Considerations. BULLET: Jurnal Multidisiplin Ilmu. 2024; 3(5):725-37.

[10]. Valli LN, Sujatha N, Sreelekshmi AN. ChatGPT as a virtual data science assistant: An empirical investigation. InRecent Advances in Sciences, Engineering, and Information Technology & Management (pp. 718-726). CRC Press.

[11]. Neoaz N, Amin MH. Leveraging Artificial Intelligence for Early Lung Cancer Detection through Advanced Imaging Analysis. Global Journal of Computer Sciences and Artificial Intelligence. 2025 Jan 26; 1(1):55-65.

[12]. Rauf, M. A., Jim, M. M. I., Rahman, M. M., & Tariquzzaman, M. (2024). AI-POWERED PREDICTIVE ANALYTICS FOR INTELLECTUAL PROPERTY RISK MANAGEMENT IN SUPPLY CHAIN OPERATIONS: A BIG DATA APPROACH. *International Journal of Science and Engineering*, *1*(04), 32-46.

[13]. Uzzaman, A., Jim, M. M. I., Nishat, N., & Nahar, J. (2024). Optimizing SQL databases for big data workloads: techniques and best practices. *Academic Journal on Business Administration, Innovation & Sustainability*, *4*(3), 15-29.

[14]. Rahman, M. A., & Jim, M. M. I. (2024). Addressing Privacy And Ethical Considerations In Health Information Management Systems (IMS). *International Journal of Health and Medical*, *1*(2), 1-13.

[15]. Mehta A, Niaz M, Adetoro A, Nwagwu U. Advancements in Manufacturing Technology for the Biotechnology Industry: The Role of Artificial Intelligence and Emerging Trends. International Journal of Chemistry, Mathematics and Physics. 2024; 8(2):12-8.

[16]. Raza A, Farhan S, Nasir S, Salamat S. Applicability of 3D printed fighter aircraft model for subsonic wind tunnel. In2021 International Bhurban Conference on Applied Sciences and Technologies (IBCAST) 2021 Jan 12 (pp. 730-735). IEEE.

[17]. Neoaz N, Bacha A, Khan M, Sherani AM, Shah HH, Abid N, Amin MH. AI in Motion: Securing the Future of Healthcare and Mobility through Cybersecurity. Asian Journal of Engineering, Social and Health. 2025 Jan 29; 4(1):176-92.

[18]. Neoaz N. Human Factors in Information Assurance: A Review of Behavioral and Cultural Aspects. International Journal of Multidisciplinary Sciences and Arts.;3(4):235-42.

[19]. Valli LN, Sujatha N. Predictive Modeling and Decision-Making in Data Science: A Comparative Study. In2024 5th International Conference on Recent Trends in Computer Science and Technology (ICRTCST) 2024 Apr 9 (pp. 603-608). IEEE.

[20]. Neoaz N, Amin MH. Advanced AI Paradigms in Mental Health: An In-depth Exploration of Detection, Therapy, and Computational Efficacy. Global Insights in Artificial Intelligence and Computing. 2025 Jan 25; 1(1):40-6.

[21]. Neoaz N, Amin MH, Shah HH. Predicting Depression Trajectories: A Novel AI Approach for Personalized Mental Health Treatment. Global Journal of Emerging AI and Computing. 2025 Jan 21; 1(1):15-24.

[22]. Khan M, Sherani AM. Leveraging AI for Efficient Healthcare Workforce Management: Addressing Staffing Shortages and Reducing Burnout. Global Journal of Computer Sciences and Artificial Intelligence. 2025 Jan 25; 1(1):43-54.

[23]. X. Meng, P. Zhang, Y. Xu, and H. Xie, ‘‘Construction of decision tree based on C4. 5 algorithms for online voltage stability assessment,’’ Int. J. Electr. Power Energy System. vol. 118, Jun. 2020, Art. No. 105793.

[24]. Sahibzada S, Nasir S, and Malik FS, Lodhi SK. AI-Driven Aerodynamic Design Optimization for High-Efficiency Wind Turbines: Enhancing Flow Dynamics and Maximizing Energy Output. Eur. J. Sci. Innov. Technol. 2024; 4:47-53.

[25]. Sujatha N, Valli LN, Prema A, Rathiha SK, Raja V. Initial centroid selection for K-means clustering algorithm using the statistical method. International Journal of Science and Research Archive. 2022 Dec 30; 7(02):474-8.

[26]. Mehta A, Patel N, Joshi R. Method Development and Validation for Simultaneous Estimation of Trace Level Ions in Purified Water by Ion Chromatography. Journal of Pharmaceutical and Medicinal Chemistry. 2024 Jan; 10(1).

[27]. Nasir S, Hussain HK, Hussain I. Active Learning Enhanced Neural Networks for Aerodynamics Design in Military and Civil Aviation. International Journal of Multidisciplinary Sciences and Arts. 3(4):152-61.

[28]. Khan M, Sherani AM. Ethical Implications of AI in Healthcare: Balancing Innovation with Patient Privacy and Security. Global Journal of Machine Learning and Computing. 2025 Jan 23; 1(1):15-28.

[29]. Neoaz N. Cybersecurity and Information Assurance: Bridging the Gap. International Journal of Social, Humanities and Life Sciences. 2024; 2(1):37-46.

[30]. Sahibzada S, Malik FS, Nasir S, Lodhi SK. AI-Augmented Turbulence and Aerodynamic Modelling: Accelerating High-Fidelity CFD Simulations with Physics-informed Neural Networks. International Journal of Innovative Research in Computer Science and Technology. 2025 Feb 21; 13(1):91-7.

[31]. Khan M, Sherani AM. Understanding AI-Driven Cardiovascular Risk Prediction in Underserved Populations: Addressing Social Determinants of Health through Data Analytics. Global Journal of Universal Studies. 1(2):591052.

[32]. Beduschi, F., Turconi, F., De Gregorio, B., Abbruzzese, F., Tiozzo, A., Amabili, M., & Prospero, A. (2021, December). Optimizing rotating equipment maintenance through machine learning algorithm. In *Abu Dhabi International Petroleum Exhibition and Conference* (p. D031S088R001). SPE.

[33]. Rahman, A., Ashrafuzzaman, M., Jim, M. M. I., & Sultana, R. (2024). Cloud Security Posture Management Automating Risk Identification and Response In Cloud Infrastructures. *Academic Journal on Science, Technology, Engineering & Mathematics Education*, *4*(03), 151-162.

[34]. Rauf, M. A., Jim, M. M. I., Rahman, M. M., & Tariquzzaman, M. (2024). AI-POWERED PREDICTIVE ANALYTICS FOR INTELLECTUAL PROPERTY RISK MANAGEMENT IN SUPPLY CHAIN OPERATIONS: A BIG DATA APPROACH. *International Journal of Science and Engineering*, *1*(04), 32-46.

[35]. Khan M, Sherani AM. From Data to Decisions: the Impact of AI on Healthcare Systems. BULLET: Jurnal Multidisiplin Ilmu. 2024; 3(4):589-98.

[36]. Shaji A, Amritha AR, Rajalakshmi VR. Weather prediction using machine learning algorithms. In2022 International Conference on Intelligent Controller and Computing for Smart Power (ICICCSP) 2022 Jul 21 (pp. 1-5). IEEE.

[37]. Autor, D. H. (2015). Why Are There Still So Many Jobs? The History and Future of Workplace Automation. Journal of Economic Perspectives, 29(3), 3-30. https://doi.org/10.1257/jep.29.3.3

[38]. Susskind, R. (2020). Online Courts and the Future of Justice. Oxford University Press.

[39]. Uzzaman, A., Jim, M. M. I., Nishat, N., & Nahar, J. (2024). Optimizing SQL databases for big data workloads: techniques and best practices. *Academic Journal on Business Administration, Innovation & Sustainability*, *4*(3), 15-29.

[40]. Rahman, M. A., & Jim, M. M. I. (2024). Addressing Privacy and Ethical Considerations In Health Information Management Systems (IMS). *International Journal of Health and Medical*, *1*(2), 1-13.

[41]. Jeni, F. A., Mutsuddi, P., & Das, S. (2020). The impact of rewards on employee performance: a study of commercial banks in Noakhali Region. *Journal of Economics, Management and Trade*, *26*(9), 28-43

[42]. Khan M, Sherani AM. Transforming Aging and Dementia Care with Artificial Intelligence: Opportunities and Challenges. Global Journal of Machine Learning and Computing. 2025 Jan 25; 1(1):29-42.

[43]. Zhou, H.; Li, Y.; Wu, W. Aptamers: Promising Reagents in Biomedicine Application. Adv. Biol. 2024, 2300584

[44]. Weis CV, Jutzeler CR, Borgwardt K. Machine learning for microbial identifica-tion and antimicrobial susceptibility testing on MALDI-TOF mass spectra: a systematic review. Clin Microbiol Infect. 2020; 26(10):1310–7. https://doi.org/10.1016/j.cmi.2020.03.014.

[45]. Choudhary V, Mehta A, Patel K, Niaz M, Panwala M, Nwagwu U. Integrating Data Analytics and Decision Support Systems in Public Health Management. South Eastern European Journal of Public Health. 2024:158-72.

[46]. Joshi, M. (2024). Artificial Intelligence (AI) in healthcare. *International Journal of Innovative Research in Science, Engineering and Technology*, *13*(2), 451-453.

[47]. MERAD, M., ARIF, L., & SOLTANE, M. M. *Artificial intelligence-based monitoring and control of drilling operation and well integrity in unconventional reservoirs shale gas exploration''A Comprehensive Case Study on Well Integrity throughout the Full Life Cycle'* (Doctoral dissertation).

[48]. Shaheen, M. Y. (2021). Applications of Artificial Intelligence (AI) in healthcare: A review. *ScienceOpen Preprints*.

[49]. Lechner, M., & Mareckova, J. (2024). Comprehensive Causal Machine Learning. *arXiv preprint arXiv:2405.10198*.

[50]. Valli LN. Under the titles for Risk Assessment, Pricing, and Claims Management, write Modern Analytics. Global Journal of Universal Studies. 2024; 1(1):132-51.

[51]. Shehzad K. Predictive AI Models for Food Spoilage and Shelf-Life Estimation. Global Trends in Science and Technology. 2025 Feb 17; 1(1):75-94.

[52]. Choudhary V, Patel K, Niaz M, Panwala M, Mehta A, Choudhary K. Implementation of Next-Gen IoT to Facilitate Strategic Inventory Management System and Achieve Logistics Excellence. In2024 International Conference on Trends in Quantum Computing and Emerging Business Technologies 2024 Mar 22 (pp. 1-6). IEEE.

[53]. Sucharitha, G., & Chary, D. V. (2021). Predicting the effect of Covid-19 by using artificial intelligence: A case study. Materials Today: Proceedings.

[54]. Smith KP, Kirby JE. Image analysis and artificial intelligence in infectious disease diagnostics. Clin Microbiol Infect. 2020; 26(10):1318–23. https://doi.org/10.1016/j.cmi.2020.03.012.