

Building Public Trust: The Role of Ai in Preventing and Exposing Fraudulent Financial Reporting in the Public Sector – a Systematic Literature Review

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ABSTRACT

Undetected financial reporting fraud can undermine public trust in the government. Artificial Intelligence (AI) has emerged as a potential solution to detect and uncover financial reporting fraud more quickly and accurately. AI offers real-time big data analysis capabilities, which can help prevent misuse of public funds. The purpose of this study is to systematically review the existing literature on the role of AI in preventing and uncovering financial reporting fraud in the public sector, and to identify ethical and regulatory challenges in its implementation. The method used in this study is a Systematic Literature Review (SLR), where relevant literature is identified, screened based on inclusion and exclusion criteria, analyzed, and interpreted to provide a comprehensive overview of the topic. The results show that AI has great potential in improving the efficiency of fraud detection and strengthening public trust in government financial management. However, this study also highlights key challenges in the implementation of AI, including ethical, privacy, and bias issues, as well as the need for regulations that support the responsible use of AI.

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1. INTRODUCTION

In the era of globalization and digitalization, the public sector around the world faces increasingly complex challenges in maintaining the integrity and transparency of financial reporting. One of the main challenges is the problem of financial reporting fraud, which not only harms the government, but also the general public who depend on the accuracy of financial information for public trust. Financial reporting fraud can damage the reputation of

public institutions, disrupt the decision-making process, and ultimately reduce the legitimacy of government. Therefore, the need to improve fraud detection and prevention mechanisms is increasingly urgent.

As technology advances, Artificial Intelligence (AI) has emerged as an important tool in preventing and exposing financial reporting fraud in the public sector. AI has the ability to analyze large amounts of data quickly and effectively, and is able to detect suspicious patterns that are difficult to find

with traditional methods. This technology enables faster and more accurate decision-making in identifying indications of fraud, thereby helping government agencies to act proactively and more transparently. In this context, the role of AI in increasing public trust through the prevention and disclosure of financial reporting fraud is becoming increasingly important.

Financial reporting fraud has become a persistent problem in many countries. Financial scandals involving financial reporting manipulation, embezzlement of public funds, and corruption often rock public institutions. Data from the Association of Certified Fraud Examiners (ACFE) shows that the public sector is vulnerable to various forms of financial fraud, and the losses caused by these acts can reach trillions of dollars each year [1]. This problem is compounded by inadequate oversight systems and limited human resources to conduct audits effectively. This creates opportunities for irresponsible parties to exploit loopholes in the public financial system. Fraud in financial reporting not only reduces public trust in the government, but also hinders economic development and better public services. In many developing countries, financial fraud is often accompanied by weak law enforcement, making the situation worse. Therefore, the public sector needs to find innovative solutions that can help address this problem more effectively.

The application of AI technology in preventing financial reporting fraud in the public sector has received significant attention in recent years. AI is able to identify suspicious financial behavior patterns through machine learning and data mining techniques. By analyzing financial transaction data in depth, AI can find anomalies that are impossible for humans to find. For example, research conducted by [2] showed that machine learning models, such as ensemble learning, successfully detected fraud with an accuracy rate of up to 99% in cryptocurrency transactions. This shows the great potential of AI in detecting fraud in various sectors, including the public sector [3]. explains how AI is used in detecting banking fraud by

utilizing machine learning techniques that can identify suspicious transactions based on historical data. The use of AI in analyzing financial reports can also reduce the risk of human error in manual audits, which are often the cause of fraud going undetected. Thus, AI not only helps detect fraud faster but also strengthens financial audits through deeper and more transparent data analysis.

According to [4] Integration of AI with IT governance in accounting and auditing can improve the efficiency and accuracy of financial reporting, as well as improve auditors' decision-making capabilities. This integration is also important in ensuring that the use of AI in fraud detection complies with applicable ethical and regulatory standards in the public sector. Previous studies have highlighted the importance of using advanced technology in financial audits [5], examines how AI is used to detect fraud in the accounting sector and shows that machine learning methods such as supervised and unsupervised learning are effective in identifying anomalies in financial data. In the public sector context, this research is relevant because it highlights the importance of AI in detecting complex fraud patterns that often go undetected by human auditors.

Another study conducted by [6] focuses on the use of AI to address the problem of data imbalance in fraud detection in the banking sector. They show that AI algorithms such as XGBoost can significantly improve the fraud detection capability on imbalanced data, which is also a common challenge in the public sector. This research shows that AI technology can be effectively applied to analyze large and complex data in the public sector, where fraud is often hidden in piles of financial data [7]. In their literature review they also found that blockchain and AI have great potential in reducing fraud by providing a transparent and immutable platform for recording financial transactions. Blockchain combined with AI can create an environment where any suspicious transactions can be easily traced and verified, thereby increasing transparency and public trust in government institutions.

This study aims to provide a comprehensive literature review on the role of AI in preventing and disclosing financial reporting fraud in the public sector. By exploring various AI approaches that have been applied in the context of finance and accounting, this study is expected to provide new insights for governments and policymakers on how this technology can be used effectively to improve integrity and transparency in public financial management. This study also aims to identify challenges faced in adopting AI in the public sector, as well as provide recommendations to overcome these obstacles in order to realize a more transparent and accountable financial system. The research questions in this study are as follows:

RQ 1: How is AI implemented in the detection of financial fraud in the public sector?

RQ 2: What are the ethical and regulatory challenges in applying AI to build public trust?

2. LITERATURE REVIEW

2.1 *Understanding AI*

Understanding AI or Artificial Intelligence refers to the study and development of systems or machines that can perform tasks that typically require human intelligence. These tasks include reasoning, problem-solving, learning, language understanding, and perception. AI operates through algorithms and models that allow computers to process vast amounts of data, identify patterns, and make decisions based on that data [5]. AI systems can be broadly categorized into two types: narrow AI, which is designed to perform specific tasks (such as image recognition or speech translation), and general AI, which aims to replicate human-like intelligence across a wide range of activities. The advancements in AI have been driven by breakthroughs in machine learning, deep learning, and natural language processing, enabling more sophisticated and autonomous decision-making.

AI is increasingly being integrated into decision-making processes, offering enhanced efficiency and accuracy. In the public sector, AI can significantly improve

data management, fraud detection, and service delivery by automating routine tasks and analyzing large datasets. However, the application of AI also comes with challenges such as ethical concerns, potential biases, and the need for regulatory frameworks to ensure transparency and fairness. As AI continues to evolve, understanding its capabilities, limitations, and societal impact is essential for leveraging its full potential while mitigating risks.

2.2 *Understanding Fraud*

Understanding fraud particularly in the context of financial reporting, refers to deliberate acts of deception intended to secure unlawful or unfair gain. Fraud in financial reporting typically involves misstatements or omissions of material information in financial reports, with the intent to mislead stakeholders, such as investors, auditors, or regulators, regarding the true financial condition of an organization. According to previous studies, fraud can take various forms, including asset misappropriation, fraudulent financial statements, and corruption. The motivations for committing fraud are often explained by the "fraud triangle," which consists of three factors: pressure, opportunity, and rationalization. Financial fraud poses significant risks to organizational integrity and public trust, particularly in the public sector, where transparency and accountability are crucial [1]. Therefore, detecting and preventing fraud has become a critical focus for governments and organizations alike, with increasing attention on leveraging technology, such as Artificial Intelligence (AI), to enhance fraud detection and maintain ethical standards in financial management.

2.3 *Understanding Financial Reports*

Understanding financial reports is essential for assessing the financial health and performance of an organization. Financial reports, which typically include the balance sheet, income statement, and cash flow statement, provide a comprehensive overview of an organization's assets, liabilities, revenues, expenses, and overall financial position over a specific period. These

reports are used by a variety of stakeholders—such as investors, creditors, regulators, and management—to make informed decisions about investments, lending, or operational adjustments. Previous research has emphasized the importance of accurate and transparent financial reporting in ensuring accountability and trust, particularly in the public sector where public funds are involved [8]. The preparation and presentation of financial reports are guided by accounting standards and regulatory frameworks, such as Generally Accepted Accounting Principles (GAAP) or International Financial Reporting Standards (IFRS), to ensure consistency and comparability across organizations. Misstatements or manipulations in financial reports can lead to severe consequences, including financial losses, legal penalties, and reputational damage, highlighting the need for robust internal controls and external audits.

2.4 Understanding The Public Sector

Understanding the public sector involves recognizing its role as the segment of the economy that is responsible for providing essential services and infrastructure that benefit society as a whole, rather than generating profit. The public sector is composed of government agencies, public institutions, and organizations funded by taxes and governed by public policy to serve the needs of citizens [3]. Unlike the private sector, which operates for commercial gain, the public sector's primary objectives are to ensure public welfare, promote social equity, and manage resources in a way that benefits the collective good. Key areas of the public sector include healthcare, education, transportation, public safety, and social services. Previous research has highlighted the importance of transparency, accountability, and efficiency in public sector operations, as these characteristics directly impact public trust and the effectiveness of governance. The public sector is often subject to unique challenges, such as bureaucratic processes, resource constraints, and political influences, which can affect its capacity to

deliver services effectively. Recent advancements in technology, particularly in data management and automation, are being explored as ways to improve public sector performance, reduce inefficiencies, and enhance service delivery to citizens.

2.5 The Role of Artificial Intelligence (AI) In the Public Sector

Artificial Intelligence (AI) has become a critical component in the transformation of the public sector in many countries, particularly in efforts to improve efficiency, transparency, and accountability in public services. The application of AI in the public sector covers a wide range of functions, from data-driven decision-making to fraud detection and prevention in financial management. AI offers automation solutions that enable public institutions to process large amounts of data quickly, reduce administrative burdens, and provide more responsive services to the public. For example, AI is used to monitor budget management, predict resource needs, and ensure more targeted allocation of funds. This creates opportunities for governments to improve their work processes by minimizing the potential for human error, which often leads to inefficiencies and errors in financial management [8].

One of the biggest contributions of AI in the public sector is its ability to automatically detect and uncover financial fraud. Financial reporting fraud, whether intentional or unintentional, has become a serious problem in many public institutions. AI allows systems to analyze financial transaction patterns in detail and detect anomalies that may indicate fraud or cheating. Using machine learning techniques, AI can study historical data and identify suspicious financial behavior, such as transactions that do not match previous habits or activities that indicate data manipulation [3]. In this context, AI not only helps auditors to be more effective in carrying out their duties, but also contributes to increasing public trust in the transparency of public financial management [2].

AI also plays a significant role in improving the quality of decision-making in

the public sector. With AI's ability to analyze big data, governments can make more informed decisions based on real-time analytics provided by AI. The technology can also predict future trends based on historical data, helping governments plan more targeted and proactive policies. For example, AI can be used to project budget needs, monitor the performance of infrastructure projects, and ensure that public funds are used efficiently. In various countries, the application of AI has been shown to reduce corruption and strengthen accountability systems [9] [10].

While the potential of AI in the public sector is enormous, there are a number of challenges that need to be overcome. One is the availability and quality of data. AI requires complete and structured data to function optimally, but in many public institutions, data is often scattered and poorly integrated. In addition, other challenges are regulation and ethics, where governments must ensure that the use of AI complies with applicable legal and ethical standards [11]. In some countries, the adoption of AI in the public sector is still limited due to the lack of adequate technological infrastructure and human resources to support the widespread implementation of AI. Therefore, policies that support the development of AI and cooperation between institutions are needed to ensure that this technology can be implemented effectively and sustainably [12].

2.6 Detecting Financial Report Fraud with AI Technology

Financial reporting fraud has become one of the biggest challenges in financial management, both in the public and private sectors. Artificial Intelligence (AI) technology offers a promising solution in detecting and preventing such fraudulent activities. AI is able to analyze huge volumes of data with speed and accuracy that is impossible for humans to achieve, especially in the context of complex and intricate financial reporting [13]. In this case, AI can help identify anomalous patterns or unusual behavior, which may indicate fraud. For example, machine learning algorithms are able to recognize suspicious

transaction patterns and detect significant differences between actual data and the financial statements presented. Studies have shown that AI, when used to detect financial fraud, can increase detection accuracy by up to 99%, as found in a study on fraud detection in blockchain-based transactions [14].

AI leverages machine learning techniques that allow the system to learn from historical data and identify anomalies or fraudulent patterns in financial statements. The machine learning used by AI is not only limited to supervised learning methods, but also involves unsupervised learning methods, which allow the system to detect anomalies in unlabeled data. These techniques have been widely used in detecting financial fraud across various industries. For example, algorithms such as XGBoost and Support Vector Machine (SVM) have proven effective in identifying suspicious transactions in the banking and insurance industries [15]. Unsupervised learning techniques allow AI systems to find hidden patterns that are often undetectable by humans, thereby increasing the accuracy of identifying potential financial fraud.

AI can also combine various analytical techniques such as text analysis using Natural Language Processing (NLP) to examine financial documents in depth. This analysis allows AI to detect irregularities in the language or terminology used in financial statements, as well as check the correspondence between the numerical data and the narrative presented. This is very useful in forensic audits, where auditors need to examine thousands of documents in a relatively short time. AI supported by text analysis capabilities provides an advantage in examining financial documents in depth, which is often where fraud is hidden [16].

While AI offers many advantages in financial reporting fraud detection, there are challenges that need to be overcome. These challenges include the quality of the data used to train AI models, as well as potential biases in algorithms that could lead to incorrect conclusions. Incomplete or inaccurate data can hinder AI's ability to detect fraud effectively [12]. In addition, privacy and data

security issues are also major concerns, especially when AI is used to analyze sensitive financial information. Therefore, it is important to ensure that AI systems are equipped with adequate security protocols and comply with applicable regulations, such as ethical standards for the use of technology in the public sector [17].

3. METHODS

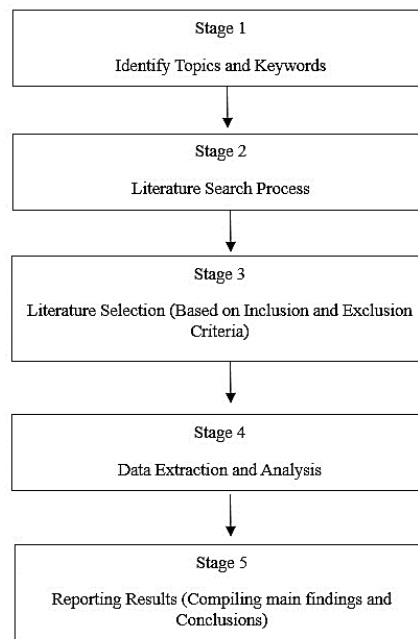


Figure 1. Systematic Literature Review Research Process

3.1. Formulating Research Questions

The research questions are formulated based on the exploration of existing literature and the latest developments in AI implementation for detecting financial fraud in the public sector. Relevant keywords such as "AI in the public sector," "AI in financial reporting fraud detection," "public trust," and "AI technology in accounting and auditing" were used in the search on the Scopus database. The focus of this study is to investigate the benefits and challenges of AI implementation in the public sector. The research questions are designed to deepen the understanding of how AI is implemented and the challenges in detecting financial fraud in the public sector.

3.2. Article Selection Process

The selection process was carried out thoroughly to identify relevant studies from various sources. The Scopus database was

used to collect articles from leading academic publishers such as Elsevier, MDPI, Springer, Wiley, and Taylor & Francis. Keywords used in the search included "AI in the public sector," "AI in financial reporting fraud detection," "public trust," and "AI technology in accounting and auditing." A specific search protocol was applied when exploring the Scopus database, focusing on relevant research variables.

The research method used in this study is the Systematic Literature Review (SLR), which aims to identify, review, and evaluate all relevant studies to obtain comprehensive results and summarize them as a whole [18]. This study follows the SLR methodology consisting of five stages or phases, in accordance with the guidelines described by [19]:

used to collect articles from leading academic publishers such as Elsevier, MDPI, Springer, Wiley, and Taylor & Francis. Keywords used in the search included "AI in the public sector," "AI in financial reporting fraud detection," "public trust," and "AI technology in accounting and auditing." A specific search protocol was applied when exploring the Scopus database, focusing on relevant research variables.

3.3. Selection and Evaluation

After implementing the planned search strategy on Scopus, 5,500 entries were identified in the database. Of these, 2,100 duplicates were removed as they were outside the established publication year range, leaving 3,400 articles for screening. The eligibility of these 3,400 articles was evaluated, with each article assessed using inclusion and exclusion criteria. Articles had to be published between 2020 and 2024. A

total of 2,000 articles were excluded in the first screening process based on subject areas. Subsequently, out of the remaining 1,400 articles, 1,100 were excluded in the second screening based on article type, publication status, and open access status, leaving 300 articles for further filtering. Of these, 50 articles were excluded as their abstracts were irrelevant to the field of accounting, 160 articles were excluded for not aligning with the research objectives, and 70 articles were removed due to limited contextual relevance or a too-narrow focus on specific issues. In the final analysis stage, 20 articles that met the criteria were included in the review.

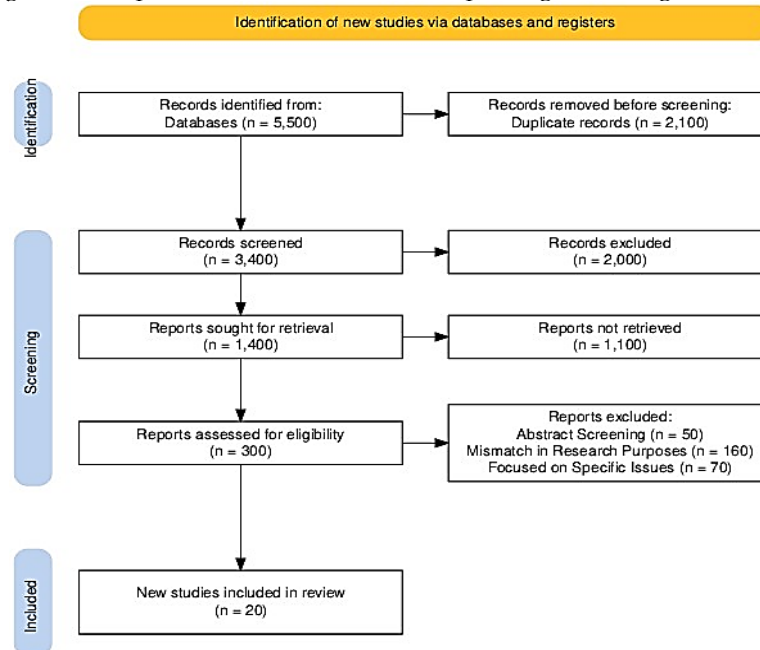
3.4. Analysis and Synthesis

By analyzing 20 articles and conducting data extraction, this study gains an understanding of the implementation and

challenges of AI in detecting financial fraud in the public sector. The researchers conducted content analysis on the relationship between the research topic of big data and the public sector in the collected literature. The results of the analysis were synthesized to address the research questions.

3.5. Reporting Findings

The detailed information presented includes search strategies, inclusion and exclusion criteria, the study selection process, quality assessment, data extraction, and data synthesis. The findings are then presented through a report or scientific article that contains comprehensive and structured information about the benefits and challenges of using big data, which can support the transformation of public sector accounting reporting in the digital era.



Source : Generated from PRISMA 2020 database

Figure 2. Prism Table

This Systematic Literature Review investigation follows the guidelines of the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) proposed by [20]. PRISMA is a comprehensive framework that provides clear, unbiased, and rigorous guidelines for reporting systematic reviews. Initially developed for health research, PRISMA has been widely adopted in the fields of business and marketing [21].

4. RESULTS AND DISCUSSION

4.1. Implementation of AI in Financial Fraud Detection in the Public Sector

Financial reporting fraud in the public sector has become a serious global issue. The public sector, as the manager of state resources, is responsible for ensuring transparency and accountability in its financial reporting. However, the oversight and audit processes in the public sector are often limited in identifying fraud hidden in

the very large and complex volume of data. In an effort to address this issue, Artificial Intelligence (AI) has been identified as a technology that can transform the way the public sector detects and addresses financial fraud. The application of AI in fraud detection offers tremendous capabilities to identify suspicious patterns, analyze financial data at scale, and improve the efficiency of financial audits, thereby helping the public sector maintain the integrity of the financial system.

AI in financial reporting fraud detection leverages machine learning algorithms to analyze historical data and detect anomalies in financial patterns. AI is capable of analyzing thousands, even millions of financial transactions at a speed and accuracy that is impossible for humans to achieve. This technology not only simplifies the financial audit process but also reduces the risk of fraud that is undetected by traditional methods. AI enables the identification of unusual transaction patterns, which are often early signs of fraud. For example, AI can recognize transactions that occur outside normal business hours or detect recurring flows of small amounts that are significant in total. These capabilities make AI an invaluable tool in fraud detection, especially in the public sector where financial transactions are often highly complex.

The implementation of AI in fraud detection in the public sector brings a number of significant benefits. First, AI is able to automate the financial monitoring process, allowing auditors to focus more on deeper analysis rather than routine tasks. This process not only increases the efficiency of auditors' work but also accelerates fraud detection. In a study conducted by [22], the application of AI to blockchain-based transactions shows that machine learning models, such as ensemble learning, have a very high level of accuracy, reaching 99% in detecting fraudulent transactions [7]. This technology can be applied to the financial system in the public sector, where AI can be used to identify suspicious patterns in financial data and provide early warnings before major fraud occurs. AI allows for broader oversight of all financial transactions

carried out by government agencies. With a very large and diverse transaction volume, such as budget management, procurement of goods and services, and routine expenditures, traditional auditors may be overwhelmed to monitor everything manually. [3] found that AI can efficiently identify fraud in banking transactions by using machine learning algorithms specifically designed to analyze imbalanced and big data [23]. In the public sector, AI can be used to automatically monitor every financial transaction, so that fraud can be detected at an early stage.

AI's ability to analyze huge amounts of data also allows for more precise fraud detection [4] emphasizes the importance of integrating AI with IT governance to maximize the benefits of AI in financial fraud detection. This integration ensures that the use of AI is effective and in accordance with applicable regulations, especially in terms of transparency and accountability [5]. In the public sector, where state budget management involves many stakeholders, the application of AI combined with good technology governance can help create a safer and more reliable system.

Several previous studies have revealed the superiority of AI in detecting financial fraud. [24] emphasizes the use of ensemble learning in blockchain-based fraud detection, whereas [3] more focused on the use of machine learning in detecting banking transaction fraud. While both studies highlight the potential of AI in detecting fraud, they highlight different approaches: [24] an ensemble learning method that combines multiple models to improve accuracy, while [3] uses a single customized machine learning algorithm to analyze banking transaction data. Both studies show that AI can be applied in various financial sector contexts, both public and private.

Meanwhile, research conducted by [4] highlights the importance of good technology governance to ensure that the use of AI complies with applicable standards and regulations, while [17] more emphasis on the ethical and social responsibility aspects of using AI in the financial sector. Both studies show that while AI offers many benefits, there

needs to be a clear ethical framework and good governance to ensure that this technology is used responsibly and transparently.

AI is not only used to detect fraudulent transactions directly, but also to identify financial anomalies that can be early signs of fraud. Anomalies in financial statements are often a sign that something is amiss, such as data manipulation or embezzlement. AI can quickly detect these anomalies by analyzing large amounts of financial data and finding unusual patterns. For example, AI can detect unusual fluctuations in budget spending or significant differences between estimates and actual budgets. This anomaly detection is especially important in the context of financial audits, where fraud is often hidden behind clever manipulation of numbers.

Study by [6] shows that AI can address the problem of data imbalance in fraud detection. In many cases, suspicious transactions are much smaller than normal transactions, making it difficult to detect fraud without algorithms that can handle imbalanced data. AI makes it possible to detect fraud even when the amount of suspicious data is very small compared to the total number of transactions, by using techniques such as oversampling and reweighting to give higher priority to potentially fraudulent transactions.

While AI offers many benefits in detecting financial fraud, its implementation in the public sector faces a number of challenges. One of the main challenges is related to data quality. AI requires complete, accurate, and well-structured data to function optimally. In many countries, public financial systems still use manual or semi-manual methods in managing their data, which often results in data not being well integrated. In addition, there is the problem of reliance on historical data that may not always reflect the current financial situation. Other issues faced in implementing AI in the public sector are related to regulation and ethics. [17] emphasizes the importance of implementing a clear ethical framework in the use of AI, especially in terms of privacy protection and

transparency. In the public sector, where the management of state funds involves many parties and highly sensitive data, privacy issues become very important. Financial data used to train AI algorithms must be strictly protected to avoid information leaks that could endanger the security of the state or individuals.

Despite the many benefits AI offers, many public institutions are still not ready to fully adopt this technology. These challenges include a lack of technological infrastructure, limited human resources skilled in operating and managing AI systems, and a lack of understanding of how this technology can be integrated into existing financial systems. [7] shows that integrating AI with existing financial systems often requires significant investment in time and resources.

Overall, the implementation of AI in detecting financial reporting fraud in the public sector offers great opportunities to improve transparency, efficiency, and accountability. With AI's ability to analyze data at scale, detect anomalies, and reduce human error, the public sector can be more proactive in preventing and exposing fraud. Although challenges such as data quality, regulation, and technology adoption still exist, various studies have shown that AI has great potential in supporting public financial audits and oversight. With good governance and the implementation of the right ethical framework, AI can be an important tool in maintaining public trust in the management of state finances.

4.2. Ethical and Regulatory Challenges in Applying AI for Public Trust

The application of Artificial Intelligence (AI) in various sectors, including the public sector, has a major impact on operational efficiency, accountability, and transparency. In the public sector, AI is used to detect and prevent financial fraud, improve decision-making [22] and simplify complex administrative processes. However, along with the benefits presented, there are ethical and regulatory challenges that need serious attention. These challenges relate to the ethical use of data, transparency in AI

algorithms, and enforcement of regulations that maintain privacy and fairness for all parties involved. The success of AI implementation in building public trust depends largely on how these challenges are addressed.

4.2.1 Ethical Challenges in AI Applications

Ethical challenges are one of the crucial aspects in the application of AI in the public sector. AI technology, especially those based on machine learning, requires large amounts of data to train algorithms and predict outcomes. In the public sector, this data often includes highly sensitive personal information, such as financial data, health data, or other personal information that can potentially pose privacy risks. When the data used is not managed properly, there is a risk of data leakage or misuse of information. Therefore, ethics in data management is very important in ensuring that AI is used responsibly and transparently.

[17] argues that AI ethics must prioritize the principles of transparency, fairness, and accountability. AI must be designed and implemented in a way that is understandable to all stakeholders, including the general public. This transparency includes how the AI algorithm works, the types of data used, and the purposes for which the data is used. If AI is used to detect financial reporting fraud, for example, the public must be confident that the AI is working fairly without bias that harms certain groups or individuals. This is important for building and maintaining public trust in institutions that use AI technology.

Another ethical challenge is bias in AI algorithms. AI algorithms learn from the historical data they are trained on, and if that data is biased, then the AI's predictions will be biased as well. [6] explains that one of the main risks in fraud detection is that if AI is trained on imbalanced data, it can lead to bias against certain groups, such as bias based on region, economic status, or other demographics. If AI consistently identifies patterns that are not representative of the wider population, then it is likely that certain groups will be targeted more often for investigation, even though they may not be

involved in fraudulent activity. Therefore, it is important to ensure that the data used to train AI reflects a fair and inclusive representation of the entire population involved.

4.2.2 Data Privacy and Security Challenges

One of the biggest challenges in implementing AI for public trust is related to data privacy and security. Extensive use of AI requires access to personal data, which often includes highly sensitive information. In the public sector, this data may include personal financial information, health records, or population data. Careless management of data can result in data leaks, data misuse, or even violations of individuals' privacy rights. [4] emphasizes the importance of strong IT governance to ensure that data used by AI systems is safe from internal and external threats. Data security includes not only protecting against unauthorized access, but also ensuring that data used to train AI algorithms is encrypted and protected from manipulation.

Privacy challenges are further complicated by the need to share data between different departments or agencies within the public sector. For example, detecting financial reporting fraud may require data from multiple sources, such as tax records, banking records, and other transaction records. Sharing data between agencies can pose risks if there are no clear regulations on how the data should be used and who has access rights. [11] revealed that blockchain technology can be a potential solution to address privacy and data security issues by providing an immutable record of transactions, allowing for monitoring and tracking of any suspicious activity. Blockchain can help increase transparency in the use of data in the public sector, but there are still technical and regulatory challenges that need to be overcome.

4.2.3 Regulations and Ethical Standards

Regulatory challenges in the application of AI in the public sector are also important issues that need to be considered. Each country has different regulations regarding the use of technology, especially in terms of data management and privacy. However, existing regulations are often not

sufficient to accommodate the complexity and rapid development of AI technology. [7] emphasizes that one of the main obstacles to the implementation of AI is the lack of uniform regulatory standards, especially at the international level. For example, in the European Union, the implementation of the General Data Protection Regulation (GDPR) has helped address some of the challenges related to data privacy, but similar regulations are not always implemented in other countries. This creates a gap in data protection when AI is used across borders or in an international context.

Existing regulations must also ensure that AI is used ethically and does not compromise human rights. In the public sector, where decisions made by AI systems can have a direct impact on citizens' lives, it is important to ensure that AI is not used for purposes that discriminate or harm certain groups. [17] argue that adopting a strong ethical framework is essential to ensure that AI is used in a fair and responsible manner. This includes strict oversight of the algorithms used, regular audits to ensure that AI does not exhibit bias, and regulatory enforcement that ensures the protection of individual rights.

4.2.4 The Challenge of Transparency and Accountability

Transparency in the use of AI is a key factor in building public trust. AI, especially those using complex machine learning techniques, is often considered a "black box," where the public or even internal stakeholders have difficulty understanding how decisions are made by the AI system. This poses a serious challenge in the public sector, where transparency is a key prerequisite for maintaining public trust. For example, if AI is used to detect financial fraud or make decisions about public policy, the public needs to know how the AI came to those conclusions. [4] emphasizes that transparency in AI must include a clear understanding of how algorithms work, including the data used, the variables considered, and the logic used in decision-making. In the public sector context, it is important for government agencies to provide mechanisms that allow

the public to understand and, if necessary, challenge decisions made by AI. Without adequate transparency, there is a risk that AI will be used in unfair or unethical ways, which in turn could undermine public trust.

Accountability is also a major challenge. When AI is used to detect fraud or make important decisions, the question often arises of who is responsible for errors or bias. [10] emphasizes that technologies like blockchain can help improve accountability in systems that use AI. By recording every transaction or decision made by AI in a transparent and immutable system, blockchain can help track and audit every step taken by AI, making it easier to determine responsibility if something goes wrong.

Addressing the ethical and regulatory challenges of AI deployment in the public sector requires a comprehensive approach involving collaboration between government, the private sector, and civil society. Existing regulations need to be updated to reflect the complexities of AI, particularly in terms of data privacy and the use of algorithms. Governments need to establish regulatory frameworks that ensure AI is used responsibly and transparently, and encourage the safe and ethical adoption of technology in the public sector. Adequate education and training for public sector decision-makers is essential. Leaders and managers in government agencies must understand how AI works, the potential risks, and how to apply this technology ethically. This training should also cover aspects of effective technology governance, ensuring that stakeholders have a sufficient understanding of how AI can be used transparently and responsibly.

International cooperation is needed to create more uniform regulatory standards. As AI adoption expands across countries, global regulation can help address challenges arising from differing standards on privacy, data security, and the ethics of AI use. While AI offers many benefits in building public trust through increased transparency and efficiency, its implementation must be carefully managed to address ethical and regulatory challenges. With the right

approach, AI can be a powerful tool to strengthen integrity in the public sector and maintain public trust in government institutions.

DISCUSSION

In the increasingly advanced digital era, Artificial Intelligence (AI) has become an important part of financial management in the public sector. One of the most significant applications is the use of AI in detecting and exposing financial reporting fraud. AI is able to provide more effective solutions in analyzing large amounts of financial data, identifying suspicious patterns, and finding anomalies that may indicate fraudulent actions. With the automation offered by AI, the public sector can not only speed up the audit process but can also reduce the risk of human error in examining complex transactions. This implementation of AI significantly helps in maintaining public trust in the management of state finances, especially when the public demands greater transparency and accountability.

One of the relevant theories to analyze how AI helps increase public trust in financial management in the public sector is Agency Theory, which was first introduced by Jensen and Meckling in 1976. Agency Theory explains the relationship between principals (owners or society) and agents (managers or government) where agents are expected to act on behalf of the principals to achieve their best interests [25]. However, there is often a conflict of interest when the agent does not act in accordance with the principal's expectations, known as the agency problem. In the context of the public sector, this problem arises when the government, acting as an agent, misuses public funds or commits financial reporting fraud, which harms the public as the principal. The application of AI can reduce this agency problem by increasing transparency and providing objective, automated oversight of government financial reporting [26].

The application of AI in addressing the problem of financial reporting fraud is very relevant to Agency Theory because AI acts as a tool that can minimize errors or deviations made by agents (government). AI,

with its fast ability to process big data and detect fraud patterns, allows for tighter and more consistent supervision. For example, research conducted by [2] shows that AI, especially using ensemble learning methods, has high accuracy in detecting fraud in blockchain-based transactions. By using AI, the government can improve supervision of public budget usage, prevent financial manipulation, and reveal suspicious activities early.

The application of AI in detecting financial reporting fraud also strengthens the relationship between society and government. In Agency Theory, trust is a key element that must be maintained by agents to ensure that principals continue to believe in their actions. AI allows governments to act more transparently, as every financial action can be analyzed objectively and free from human bias. Research by [3] supports this by showing that AI is effective in identifying banking transaction fraud through machine learning, which can be similarly applied in the public sector to increase public trust in government financial reporting.

AI also helps improve existing financial governance systems in the public sector. [4] emphasizes the importance of strong IT governance to support AI implementation. When AI is integrated into good governance, the result is a more transparent and accountable financial system. AI, which continuously monitors and analyzes financial data, allows governments to proactively prevent and uncover fraud, before the problem escalates. Thus, AI is not only a tool to address technical issues, but also improves oversight and accountability mechanisms at the institutional level.

The application of AI in detecting financial reporting fraud also faces several challenges, especially related to ethics and regulations. The data used by AI to train the algorithm must be complete, accurate, and secure. [17] highlighted that the application of AI in the public sector must be accompanied by a clear ethical framework to ensure that the technology is used fairly and does not harm certain individuals or groups. Therefore, it is important for the government to not only

focus on the benefits of AI technology, but also ensure that its application is in accordance with applicable ethical and legal standards.

The results of this study indicate that the application of AI in detecting financial reporting fraud in the public sector not only increases efficiency, but also strengthens public trust in the government. The use of AI to detect financial fraud allows for more objective supervision, increases transparency, and provides assurance to the public that public funds are being managed properly. Within the Agency Theory framework, AI plays an important role in minimizing conflicts of interest between principals and agents, and helps ensure that agents act in the best interests of the principal. Thus, the results of this study confirm that AI is not only a technical tool, but also an important component in maintaining a relationship of trust between the public and the government in the context of financial management.

Based on the research referred to in these articles, there is a difference in focus between research conducted in industrialized

countries and in developing countries. Research in industrialized countries generally focuses on the development and application of advanced technologies, including Artificial Intelligence (AI), to improve efficiency and accuracy in detecting financial reporting fraud. This focus is often directed at leveraging established technological infrastructure and strict regulatory support, which allows for the development of more complex AI systems integrated with good governance. On the other hand, research in developing countries tends to focus on the application of these technologies in simpler contexts, with the main goal of increasing transparency and reducing the risk of corruption, given the challenges related to limited technological infrastructure and human resources. In developing countries, issues such as data management, access to technology, and socio-economic challenges are often factors that influence the application of AI in the public sector. The articles used in this study are mapped by location in Figure 2 and Figure 3 below:

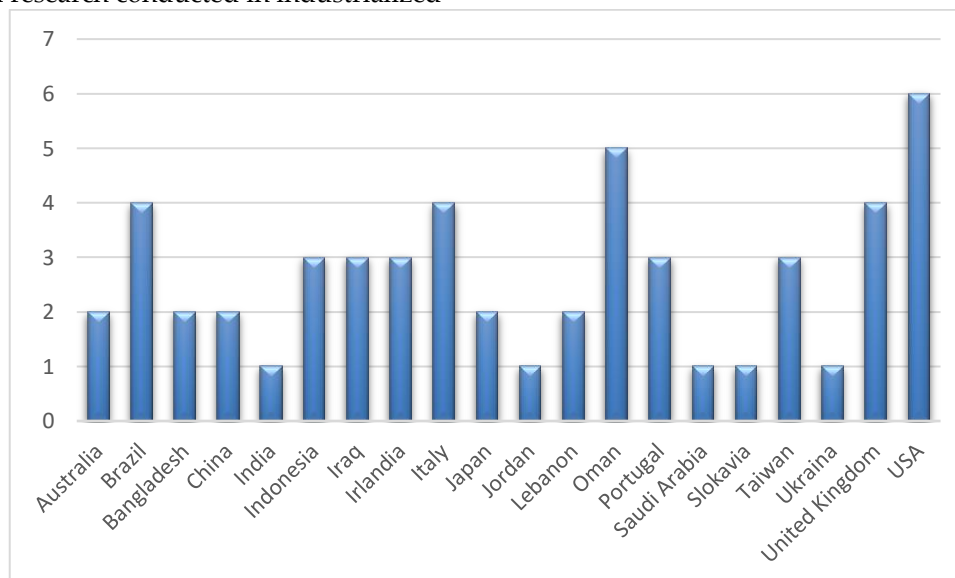


Figure 2. Number of Research by Country

Based on the data presented in Figure 1, which shows the number of studies by country, it can be seen that the United States (USA) is the country with the largest number of studies, reaching 6, followed by Oman and Italy, which each have 4 studies. Countries such as Brazil, Iran, Portugal, and the United Kingdom also have significant research

contributions. In contrast, several countries such as Bangladesh, Indonesia, Taiwan, and Iraq have relatively fewer studies, around 1 to 2 studies. This shows that there are differences in research focus in various countries, where developed countries such as the United States and countries with rapid technological growth such as Oman tend to conduct more

research related to the implementation of technology, especially in the context of Artificial Intelligence (AI) in the financial sector. Meanwhile, developing countries tend to have limitations in the number of studies, which may be due to resource factors, technological infrastructure, or different priority focuses. These data reflect that the geographic and economic context of a country affects the intensity and focus of research, especially in topics related to technology and financial management.

This is in line with research conducted by [4] which shows that countries with more advanced technological

infrastructure, such as the United States and European countries, tend to have more research focused on the application of Artificial Intelligence (AI) in the public sector, especially in financial fraud detection. This study highlights how advances in technological infrastructure and strong regulatory support drive research intensity in developed countries. In contrast, developing countries with limited technological infrastructure and resources, such as Indonesia and Bangladesh, show fewer studies, indicating challenges in adopting AI technologies widely in the public sector [14].

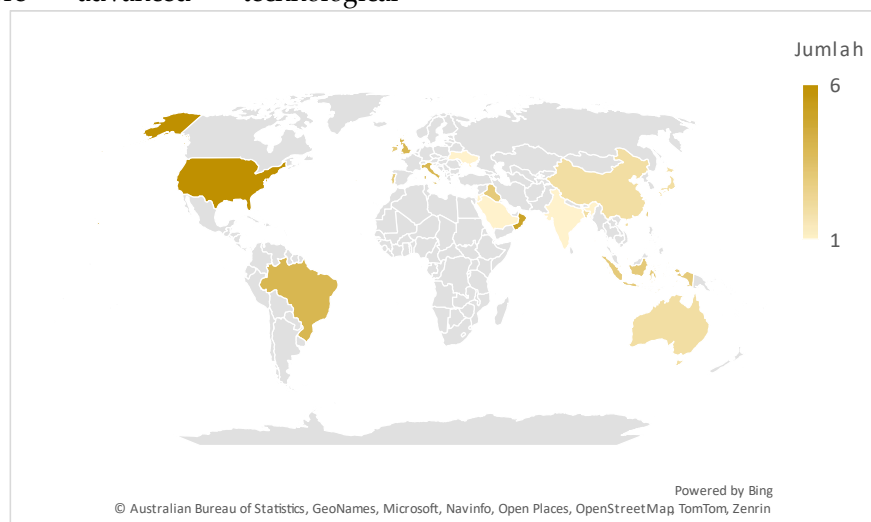


Figure 3. Geographic Chart of Number of Research by Country

Based on Figure 3, which shows the geographical distribution of the number of studies by country, it can be seen that countries with more advanced economies, such as the United States, the United Kingdom, and several European countries, have a higher number of studies related to certain topics, including the application of Artificial Intelligence (AI) in detecting financial fraud in the public sector. These countries are shown in darker colors on the map, indicating a more significant number of studies. In contrast, countries in the Asia and Africa regions, including Indonesia and several other countries, have fewer studies, indicated by lighter colors. This reflects the

differences in the level of technological advancement and access to research resources in various regions. Countries with more developed technological infrastructure tend to lead in research on AI technology, while developing countries are still struggling to overcome various challenges, such as limited resources and lack of regulations that support the implementation of this advanced technology. This geographical map reinforces the view that economic and infrastructure factors greatly influence the intensity and focus of research in various countries. This assumption is also supported by research conducted by [27].

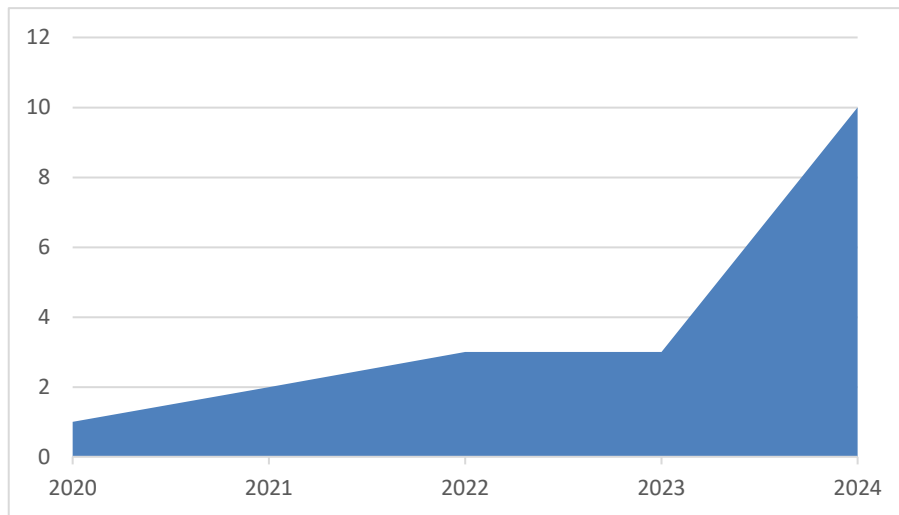


Figure 4. Number of Research by Year of Publication

Based on Figure 4, the number of studies related to the application of Artificial Intelligence (AI) in detecting financial fraud in the public sector shows a significant increase since 2020, with the peak number of publications in 2024. This graph reflects the increasing trend in research in this field, which is influenced by the increasing need for technological solutions to improve transparency and accountability in the public sector. The sharp increase in 2024 shows that this topic is increasingly becoming a major

5. CONCLUSION

The application of Artificial Intelligence (AI) in the public sector, particularly for detecting and exposing financial reporting fraud, plays a crucial role in enhancing transparency and accountability. AI's ability to analyze large datasets with precision offers an effective solution for uncovering fraud that may be difficult to detect using traditional methods. It enables governments to monitor transactions efficiently and identify suspicious patterns. However, the implementation of AI also presents challenges, particularly in ethical and regulatory areas such as data privacy, algorithm transparency, and managing bias. Effective regulation and governance are essential to ensure AI's ethical use and

focus in academic studies and practice in the field. This is in line with research conducted by [4], which shows that the development of technology and the application of AI in the public sector are getting more attention, especially in addressing challenges related to financial fraud. The increase in research can also be attributed to the increasing development of technological and regulatory infrastructure in various countries, which allows for wider and deeper adoption of AI.

maintain public trust. Furthermore, disparities in technological infrastructure across countries mean that developing nations face obstacles in adopting AI, highlighting the need for international collaboration and policy support. Overall, the study emphasizes that AI can significantly enhance fraud detection, but its success depends on proper regulation and ethical management.

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