International Journal of Religion
2024
Volume: 5| Number 7 | pp. 303 – 315
ISSN: 2633-352X (Print) | ISSN: 2633-3538 (Online)
ijor.co.uk
DOI: https://doi.org/10.61707/py0fe669

Gravitating towards Artificial Intelligence on Anti-Money Laundering A PRISMA Based Systematic Review

Md Noor Uddin Milon[1]

Abstract

In Bangladesh, like many other countries, the implementation of Anti-Money Laundering (AML) measures plays a crucial role in the fight against financial offences and the maintenance of the financial system's integrity. The integration of Artificial Intelligence (AI) is one of the technologies for AML that has emerged as a promising approach to enhance the detection and prevention of financial crimes. The researcher aims to investigate the current state of AML, the impact of AI, the roles involved, and the legislation to achieve economic stability for the transformation of Bangladesh into a smart nation by 2041. In this systematic review study, the PRISMA framework is utilized to provide a comprehensive analysis of existing literature on the application of AI in AML, with a focus on risks, laws, and implications, particularly within the context of Bangladesh. The review synthesizes findings from diverse sources (Web of Sciences, Scopus, PubMed, and DOAJ indexing articles and reports) including academic research, industry reports, and regulatory documents, to assess the effectiveness, challenges, and ethical considerations associated with AI-driven AML solutions. Through a structured search strategy and rigorous selection criteria, the researchers discovered a total of 299 research papers, consisting of 181 latest studies and 117 previous relevant studies identified and analyzed to elucidate key trends, methodologies, and gaps in the current landscape of AI-enabled AML practices. The review also offers insights and recommendations for policymakers, practitioners, and researchers interested in leveraging AI technologies to combat money laundering effectively while navigating regulatory frameworks and safeguarding privacy rights. By critically examining the intersection of AI, AML, and legal frameworks, this study contributes to the ongoing discourse on the role of technology in addressing financial crime challenges in Bangladesh and beyond.

Keywords: *Artificial Intelligence, Anti-Money Laundering, PRISMA, Systematic Review, Risks and Laws, Money Laundering, Bangladesh*

INTRODUCTION

Artificial Intelligence (AI) is widely used in anti-money laundering (AML) operations because it can analyze large volumes of data, find complicated patterns, and identify questionable transactions better than traditional approaches (Han et al., 2020). AI-powered systems can monitor financial transactions in real-time and identify suspicious activity based on predetermined parameters such as odd transaction volumes, high-risk jurisdictions, or strange transaction patterns (Usman et al., 2023). These systems can adapt to changing money laundering methods by learning from historical data. Garcia-Bedoya et al. (2021) showed that AI systems can analyse linkages between persons, corporations, and financial institutions to reveal money laundering networks. AI systems can detect suspicious entity hierarchies and relationships by analysing transactional data and other data (Sobh, 2020).

Money laundering poses an enormous challenge to Bangladesh's economic stability and integrity (Chen et al., 2018). Despite numerous initiatives to combat it, this issue persists, primarily fueled by underground mechanisms such as the hundi system (Latif, 2022). This comprehensive guide offers an in-depth exploration of AML efforts in Bangladesh, covering its historical context, legal framework, government involvement, money laundering risks, and proposed solutions (Shah, 2024). Working in AML in Bangladesh involves a multifaceted approach aimed at preventing, detecting, and combating financial crimes (MILON et al., 2023). Professionals in this field play a crucial role in ensuring compliance with AML regulations and safeguarding the integrity of the financial system (Sullivan, 2023). Responsibilities typically include conducting risk assessments, developing and implementing AML policies and procedures, and conducting due diligence on customers and transactions to identify suspicious activities (Shah, 2024). AML professionals in Bangladesh collaborate closely with regulatory agencies such as the BFIU and the Bangladesh Bank to exchange information, report suspicious

[1] Deputy Commissioner, National Board of Revenue, Bangladesh. E-mail: noor.milon414@gmail.com, ORCID: http://orcid.org/0009-0001-4359-6575, Research gate: https://www.researchgate.net/profile/Md-Noor-Milon

transactions, and support investigations (Abedin et al., 2021). They also stay abreast of developments in AML/CFT regulations and international standards set by organizations like the Financial Action Task Force (FATF) to ensure adherence to best practices (Snaijer, 2024).

Anti-Money-Laundering regimes use silent, unnoticed surveillance (Cone, 2022). Human trafficking, small-scale tax evasion, forced labour, and weapons trafficking are predicate crimes that increase money laundering risk. Money laundering risk assessment is a response to FATF-mandated AML regulations (Sultan et al., 2023). The FATF develops legislative and regulatory policies to combat terrorist financing and money laundering. FATF updates these rules and issues guidelines (Pereverzyeva & Gadjiev, 2020). AML professionals must make crucial decisions about material that may indicate money laundering. Money laundering is prevented and identified by AML legislation. Tan et al. (2023) state that the AML responsibility requires all financial sectors to strictly follow Know Your Customer (KYC) regulations to get to know their clients and identify and report suspicious, high-value transactions, customer due diligence (CDD), and transaction monitoring to prevent money laundering (Powelson, 2022).

Know Your Customer (KYC): KYC is essential for AML efforts. It entails checking clients' identities, suitability, honesty, and financial transaction risks (Tiutiunyk & Kozhushko, 2022). Financial institutions and other regulated businesses must use KYC procedures to avoid money laundering and other illegal acts (Cassella, 2019).

Customer Due Diligence (CDD): Depending on the risk level, institutions may conduct enhanced due diligence (EDD) procedures for high-risk customers. This may involve gathering additional information and scrutinising the purpose of the relationship and expected transactions (Yong & Asano, 2018).

Record-keeping and Reporting: Financial institutions maintain comprehensive records of customer information and transaction activity. They are also obligated to report suspicious transactions to relevant regulatory authorities as part of their SAR (Suspicious Activity Report) obligations (Kędzierski, 2023).

Suspicious Activity Reporting (SAR): SAR is a critical aspect of AML compliance, requiring financial institutions to report any transactions or activities that they suspect may be linked to money laundering, terrorist financing, or other illicit activities (Teichmann et al., 2022).

Transaction Monitoring: Transaction monitoring continuously monitors customer transactions for unusual or suspicious activity that may suggest money laundering or other illegal activity (Reite et al., 2023). Automated and manual systems monitor transactions in real time or retrospectively for patterns, irregularities, and red flags that may require additional inquiry by financial institutions (Han et al., 2020).

Research Gaps and Objectives

AML safeguards are essential for fighting drug trafficking, terrorism financing, corruption, and organized crime. Financial institutions must follow AML standards to avoid fines and lawsuits (Lisanawati, 2023). Global money-laundering prevention also relies on law enforcement collaboration and information exchange. AML compliance safeguards the financial system, deters crime, and upholds the law. Financial institutions can protect the global economy by establishing strong AML controls (Milon & Zafarullah, 2024). There is a limited amount of research that has been published on AI for AML (Kute et al., 2021; Usman et al., 2023). Few studies have emphasized AML for different strategies and regulations to combat money laundering activities (Garcia-Bedoya et al., 2021). Chen et al. (2018) asserted that the control and visibility of AML activities in international transactions can lead to economic stability. Therefore, it is evident that there is a tremendous research gap in AML-related research in emerging countries like Bangladesh. The researcher would like to find out the present scenario of AML, AI impact, roles, and regulations so that economic stability would be possible for transforming a smart Bangladesh within 2041. The following objectives of the study are stated below:

Representing the present scenario of the AML usages, risks, government and regulatory roles and Acts for the prevention of AML.

Evaluating the effectiveness and potential of AI applications in detecting and preventing money laundering activities.

Providing insights and recommendations for policymakers, practitioners, and researchers interested in leveraging AI for AML purposes.

LITERATURE REVIEW

Machine learning and predictive modeling can discover money laundering tendencies in consumer and entity behavior (Han et al., 2020). AI systems can recognize aberrant activity and prompt for further research by developing profiles of typical client behavior. NLP methods allow AI systems to examine unstructured data sources like text documents, emails, and social media postings to find money laundering information (Usman et al., 2023). NLP can detect illegitimate financial transactions and suspect behavior in news stories, regulatory filings, and other sources. AI algorithms may assess customers, transactions, and entities based on transaction history, geographic location, industrial sector, and customer profile (Chen et al., 2018). These risk rankings focus AML investigations and resource allocation on high-risk areas and persons.

AI speeds up regulatory reporting, KYC due diligence, and transaction monitoring for financial institutions to comply with AML standards (Kute et al., 2021). AI-powered solutions can automate compliance, decrease errors, and ensure regulatory compliance. Garcia-Bedoya et al. (2021) stated that AI systems are constantly learning and adapting to new data and threats, boosting their accuracy and efficacy. Feedback loops and data training can help AI algorithms outperform complex money laundering and evasion methods (Milon & Zafarullah, 2024). AI in AML processes could improve financial crime detection and prevention efficiency, accuracy, and agility. To maximize AI's benefits in AML while minimizing risks, data privacy, model openness, and regulatory compliance must be addressed (Powelson, 2022).

A money laundering technique involves placement, layering, and integration to hide ill-gotten gains meant for use and make them appear to come from legitimate sources (Hidayati & Sahri, 2023). This crime harms the economy, society, and government. Thus, AML legislation is crucial to combating money laundering, which spreads globally due to globalization and destabilizes financial institutions and their systems (Wang, 2020; Bhuiyan et al., 2023). AML laws, enforcement, processes, and regulations prevent illegally obtained money from entering financial systems, protecting the financial system, preventing crime, and upholding the rule of law (Truntsevsky & Dolganov, 2021). Laws, regulations, and processes aim to reveal attempts to conceal criminal assets as legitimate revenue (Frisse & Misulis, 2019). Risk assessment by AML professionals is imprecise since interpretations are contextually sensitive and findings are probabilistic (Milon & Zafarullah, 2024).

Table 1: Artificial intelligence effects on AML stated by Authors

Name of Tools	How to effect on AML	Source
AI Algorithms for Monitoring Transactions	Advanced machine learning algorithms analyses large volumes of transaction data in real-time. These algorithms can identify unusual patterns, detect anomalies, and recognize potentially suspicious transactions that may indicate money laundering.	(Lokanan & Maddhesia, 2023)
Customer Behavior Profiling	AI builds profiles by examining past consumer behavior. Any departure from these characteristics might set off alarms, giving banks the opportunity to look into and judge the validity of transactions.	(Lin & Mâsse, 2021)
Network Analysis	Network analysis is a technique used to detect and uncover instances of money laundering. In the field of AML research, network analysis often involves the use of relational data to identify both direct and concealed linkages with a money laundering node. Centrality evaluation was an early technique in network analysis that aimed to identify the most significant node in a network.	(Shaikh et al., 2021)
Automated CDD Processes	AI streamlines the consumer due diligence procedure by authenticating client identities, evaluating risk levels, and tracking modifications in customer profiles. This ensures compliance with regulatory requirements.	(Mzukisi, 2021).
Pattern and Link Analysis	AI systems utilise pattern recognition to pinpoint connections and linkages between people or things involved in questionable behavior. This aids in the discovery of intricate money laundering schemes.	(Lisanawati, 2023)
Natural Language Processing (NLP)	NLP algorithms can analyse unstructured data, such as text from emails, chat logs, and news articles, to identify potential AML-related information. This helps in gathering intelligence and understanding the context surrounding suspicious activities.	(Reite et al., 2023)
Predictive Models	Machine learning algorithms evaluate the risk attached to transactions, clients, or geographical areas.	(Cassella, 2019)

Table 2: Historical Evolution and legal Framework of AML in Bangladesh

Legal Framework	Evaluation	Description
Membership of APG	1997	Joining APG signifies Bangladesh's commitment to international cooperation in combating money laundering.
Formation National & Regional Task Force	2002	Establishment of task forces indicates a coordinated approach to address money laundering at both national and regional levels. MLPA likely refers to the initial enactment of the Money Laundering Prevention Act, which criminalizes money laundering activities. The establishment of this department suggests a specialized entity dedicated to combating money laundering within the legal framework.
Money Laundering Prevention Act		
AML Department		
1st round Mutual Evaluation	2002-2003	The evaluation likely aimed to assess Bangladesh's AML regime's effectiveness and compliance with international standards.
2nd round Mutual Evaluation	2008-2009	Another evaluation round signifies ongoing efforts to improve the AML framework based on previous assessments.
MLPA, Anil. Terrorism Act	2009	Enactment of legislation specifically targeting terrorism financing indicates a broader approach to combat financial crimes.
MLPR. ATR 2013		
ICRC Process Started	2010	Initiation of the ICRC(Immediate Compliance Review Committee) process suggests a review of compliance with international AML standards and recommendations.
NCC and Working Committee		
Bangladesh Financial Intelligence Unit(BFIU) (Operational Independence)	2012	Establishment of BFIU with operational independence enhances the effectiveness of financial intelligence gathering and dissemination. Revision of AML laws and regulations reflects efforts to adapt to evolving challenges and international standards.
MLPA,2012(MLPR,2013)		
Egmont Group Membership	2013	Joining the Egmont Group facilitates international cooperation in exchanging financial intelligence.
3rd round Mutual Evaluation (Compliant Country)	2014-2015	Attaining compliance status indicates progress in strengthening the AML/CFT regime based on evaluations.
Amendment of MLPA 2012 (Operational Independence)	2015	Amendments likely aimed at enhancing operational independence and efficiency in AML enforcement.
Restructure Central and Divisional Task Forces	2017	Task force restructuring demonstrates ongoing efforts to streamline AML enforcement mechanisms.
MLPR 2019 (MLPR,2013)	2019	Likely refers to the enactment or revision of Money Laundering Prevention Rules in 2019, further refining AML measures.
20- Year Celebration	2022	Marks two decades of efforts and achievements in combating money laundering, highlighting the commitment to sustained AML efforts.

METHODOLOGY

The gathering of data is impractical because respondents engaged in money laundering activities are unable to definitively confirm or identify specific individuals participating in money laundering as offenders or criminals (Akter et al., 2023). The research is conducted using primarily secondary data sources such as papers, journals, websites, newspapers, online portals, and television broadcasts. These sources were considered to gather the necessary information for the investigation (Bhuiyan et al., 2023). The study analysed key concepts such as money laundering, artificial intelligence, anti-money laundering, emerging economy, prevention acts and rules, government, financial institutions, public investment, international transactions, and more.

According to the 2020 PRISMA statement, publications are typically clustered using Web of Sciences, Scopus, PubMed, and DOAJ (Bhuiyan & Akter, 2024). The PRISMA standard outlines the essential components for effectively reporting evidence-based systematic reviews and meta-analyses (Molla et al., 2023; Islam et al., 2024) in Figure 1. PRISMA places a high priority on conducting reviews of randomised trials. It can also be utilised for publishing systematic reviews of other studies, such as therapy assessments. In order for customers to evaluate the credibility and usefulness of the review, it is essential to provide a comprehensive description of the systematic review methods and results in Figure 1 (Molla et al., 2023). The research study focused on important topics such as money laundering, AI, and AML in order to combat illegal financial activities and contribute to the development of Bangladesh.

Only relevant records are included when retrieving information. When making decisions about rejecting publications and reports, it's important to consider factors such as the availability of limited data, papers published in different categories, multiple languages, diverse outcomes, and disconnected impacts and findings (Bhuiyan, 2019). Throughout the investigation, the researchers discovered a total of 299 research papers, consisting of 181 latest studies and 117 previous studies Figure 1.

Upon thorough examination of the aforementioned publications, reports, news, data, and information, the researcher aims to give an analysis of the present-day utilization, risks, governmental and regulatory roles, and preventive legislation related to anti-money laundering (AML). Evaluating the capacity of artificial intelligence to identify and thwart money laundering. Providing guidance to policymakers, practitioners, and academics on the utilization of AI for Anti-Money Laundering (AML) purposes.

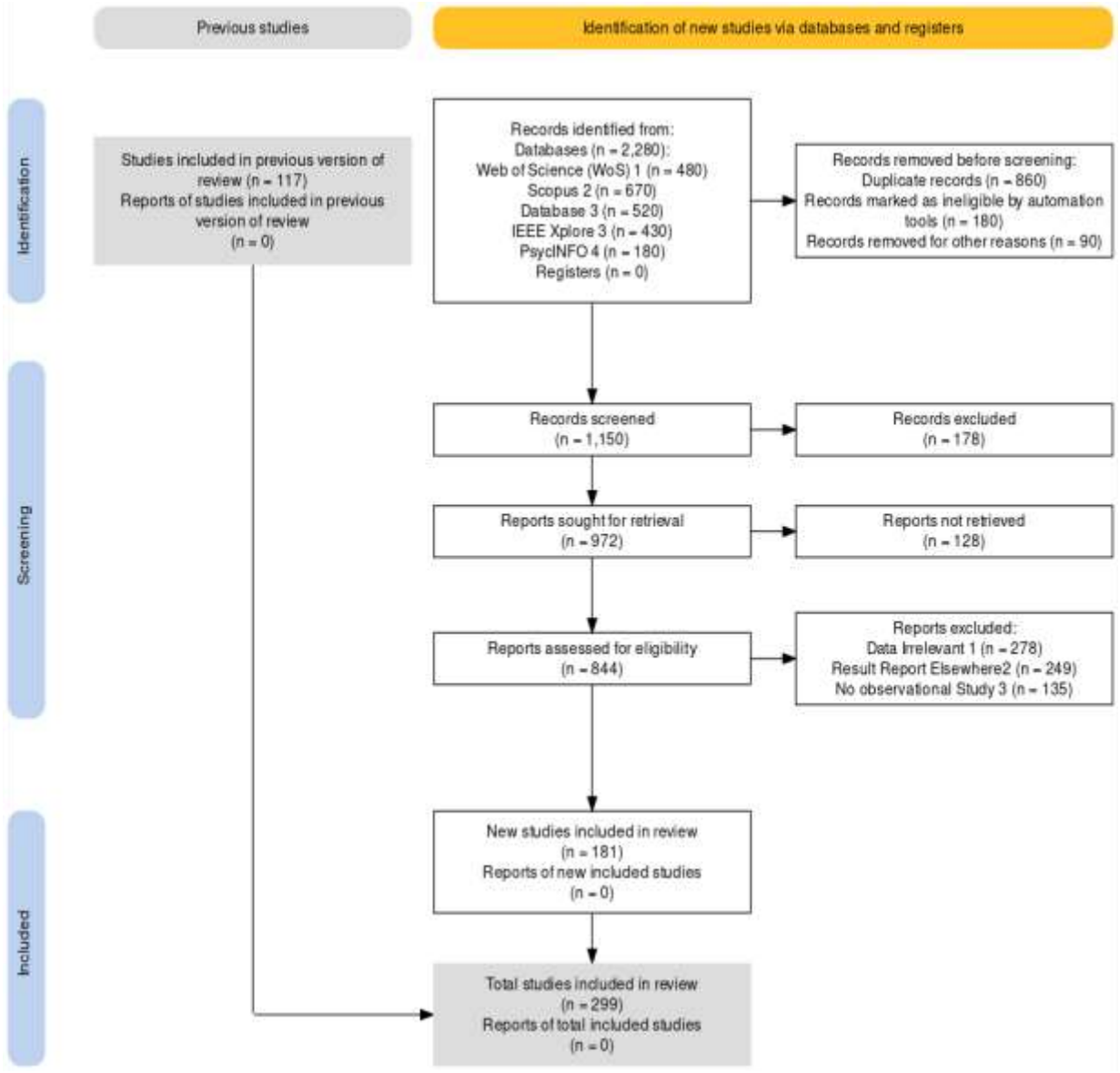


Figure 1: PRISMA Flow Diagram (2020)
Source: (Haddaway et al., 2022) [Access on April 8, 2024]

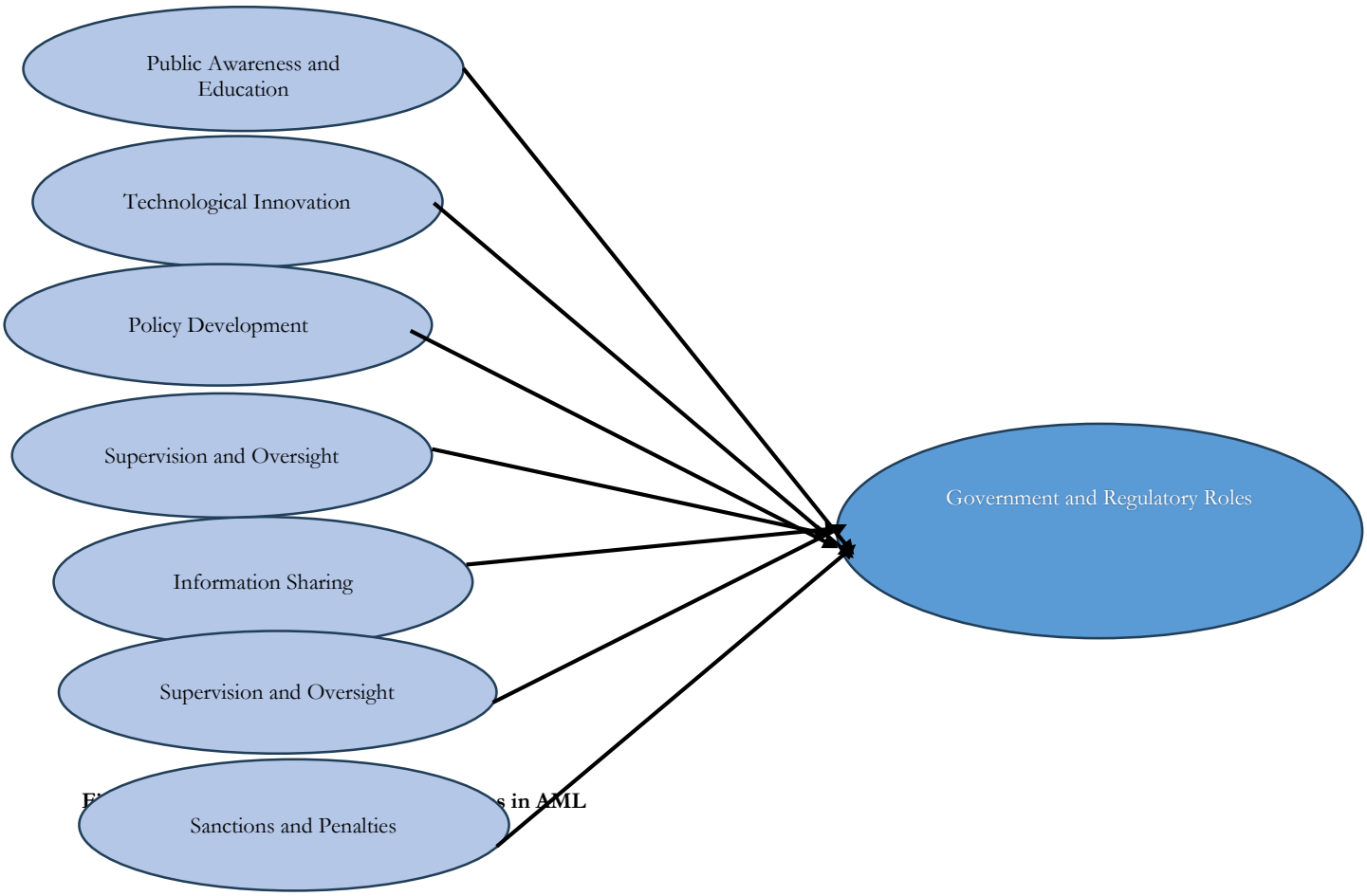
DISCUSSION

According to Lodge (2020), government and regulatory roles in AML are critical for preventing and detecting illicit financial activities. Although banks operating within a certain jurisdiction are often required to adhere to

the same anti-money laundering (AML) laws and regulations, financial institutions vary in how they organize and implement their AML initiatives. Complying with anti-money laundering (AML) requirements entails actively collaborating with financial regulatory authorities and thoroughly understanding both domestic and global regulations in all areas where your organization operates (Islam & Bhuiyan, 2022). Ultimately, it is crucial to guarantee that your business adheres to these rules in order to maintain the safety of both your clients and your organization (Fagan, 2024). Financial institutions must stay abreast of evolving rules and regulations in the broad global anti-money laundering (AML) landscape to fulfill their compliance requirements. Government and regulatory roles in AML are pivotal in mitigating financial crimes and preserving the integrity of the financial system (Lisanawati, 2023).

In Bangladesh, these roles encompass legislative enactment, regulatory oversight, and enforcement efforts. The government establishes and updates laws such as the Money Laundering Prevention Act (MLPA) to criminalize money laundering and terrorist financing activities (Akter et al., 2023). Regulatory bodies like the BFIU supervise financial institutions' compliance with AML regulations, conduct inspections, and facilitate information sharing to combat illicit financial flows (Sullivan, 2023). Moreover, international cooperation through organizations like the FATF aids in setting standards and fostering collaboration among jurisdictions. By fulfilling these roles, governments and regulatory bodies in Bangladesh work towards ensuring transparency, accountability, and stability in the financial sector, thereby contributing to national security and economic development (Makumbe, 2023) in Figure 2.

As the central bank of Bangladesh, the Bangladesh Bank plays a pivotal role in overseeing the country's financial system. It is responsible for controlling currency issuance, maintaining economic stability, and fostering employment and income growth (Chowdhury, 2022). Serving as the national FIU, the AMLD collects, analyzes, and disseminates financial intelligence related to money laundering and terrorist financing. This entity is instrumental in identifying suspicious transactions and sharing crucial information with law enforcement agencies (Kokkinis & Miglionico, 2021).



F s in AML

Table 3: Bangladeshi Legislation and Regulations

Roles	Description	Reference
Legislation and Regulation	In Bangladesh, legislation and regulation play a pivotal role in the government's efforts to combat money laundering and terrorist financing. The primary legislative framework governing AML and Combating the Financing of Terrorism (CFT) activities is the Money Laundering Prevention. This criminalizes money laundering and imposes penalties on offenders, including imprisonment and fines.	(Azinge-Egbiri, 2021)
Information Sharing	Information sharing in Bangladesh among regulatory agencies, financial institutions, and law enforcement is crucial for combating money laundering and terrorist financing. The BFIU facilitates the exchange of financial intelligence and suspicious transaction reports (STRs) to aid investigations. Additionally, the BFIU collaborates with other domestic and international agencies to share intelligence on illicit financial activities.	(Sultan & Mohamed, 2022)
Cryptocurrency Exploitation	The anonymity of cryptocurrency is used by criminals to transfer money covertly. It is imperative to comprehend blockchain technology and put strong safeguards in place to stop digital assets from being misused.	((Bhuiyan & Akter, 2024; Chowdhury, 2022)
Emerging Technologies	Advances in AI, machine learning, and big data analytics are exploited by money launderers. Experts should make use of these technologies to use intelligent AML systems to improve risk assessments and identify abnormalities.	(Bhuiyan et al., 2023; Abedin et al., 2021)
Public Awareness and Education	Governments play a role in raising public awareness about the risks of money laundering and the importance of reporting suspicious activities. They may conduct outreach programs and provide educational resources to stakeholders. The effectiveness of transaction monitoring depends on employees' knowledge and expertise. By familiarizing themselves with the rules and mechanisms of ongoing transaction monitoring, employees can effectively identify and report suspicious activities.	(Shah, 2024)
Reporting Suspicious Activities	Awareness campaigns encourage employees to promptly report suspicions, playing a vital role in fighting terrorist financing and money laundering. Government and regulatory roles in AML include establishing frameworks for reporting mistrustful actions. Financial institutions in Bangladesh are required to disclose such actions to the BFIU, which serves as the central agency for receiving, evaluating, and distributing financial intelligence.	(Sullivan, 2023)
Technological Innovation	Government and regulatory bodies leverage technological innovation to enhance AML efforts in Bangladesh. This includes implementing advanced data analytics, AI, and blockchain technology to detect suspicious transactions and patterns. By utilizing these tools, regulatory agencies like the BFIU can improve risk assessment processes, enhance monitoring capabilities, and streamline regulatory oversight. Additionally, technological innovations enable more efficient information sharing among stakeholders, facilitating collaboration in combating financial crimes. Overall, embracing technological advancements strengthens AML measures, making them more effective in safeguarding the financial system against illicit activities.	(Bhuiyan et al., 2023; Shah, 2024)

Money laundering poses an enormous challenge to Bangladesh's economic stability and integrity (Chen et al., 2018). Despite numerous initiatives to combat it, this issue persists, primarily fueled by underground mechanisms such as the hundi system (Latif, 2022). This comprehensive guide offers an in-depth exploration of AML efforts in Bangladesh, covering its historical context, legal framework, government involvement, money laundering risks, and proposed solutions in Figure 2 and Table 3 (Shah, 2024).

Money Laundering Risks

In Bangladesh, like many other countries, the implementation of Anti-Money Laundering (AML) measures plays a crucial role in the fight against financial offenses and the maintenance of the financial system's integrity in Table 4. The integration of Artificial Intelligence (AI) is one of the technologies for AML that have emerged as a promising approach to enhance the detection and prevention of financial crimes and risks in Table 4.

Key point	Description	Reference
Informal Economy	A significant portion of economic activities in Bangladesh occurs in the informal sector, which operates outside regulatory oversight. This creates opportunities for individuals and businesses to conduct illicit financial transactions without detection.	(Ahmad & Hussain, 2024)
Corruption	Bangladesh has long struggled with corruption across various levels of government and society. Corrupt officials and institutions enable money laundering activities by either ignoring questionable financial transactions or actively engaging in them.	(Chakravorty, 2023)
Financial Sector Vulnerabilities	Banks and financial institutions in Bangladesh are susceptible to being used as conduits for money laundering. The banking sector is vulnerable to abuse by money launderers due to weak internal controls, inadequate customer due diligence, and insufficient AML compliance procedures.	(Abedin et al., 2021)
Terrorist Financing	Bangladesh faces risks related to terrorist financing, given the presence of extremist groups within its borders. These groups may exploit weak controls in the financial system to finance their activities through illicit means.	(Chowdhury, 2022)
Trade-Based Money Laundering	Trade-based money laundering schemes are prevalent in Bangladesh due to its significant import-export activities. Criminals exploit gaps in trade finance and documentation to disguise the origins of illicit funds through over/under-invoicing, misrepresentation of goods, and other trade-related methods.	(Shah, 2024)
Terrorist Financing	Bangladesh faces risks related to terrorist financing, given the presence of extremist groups within its borders. These groups may exploit weak controls in the financial system to finance their activities through illicit means.	(Sullivan, 2023)

Table 4: Money Laundering Risks in Bangladesh

Key AML Laws in Bangladesh

The cornerstone of AML legislation in Bangladesh includes the Money Laundering Prevention Act, the UNCAC, and the MLPO 2008. These laws establish a robust legal framework for identifying, preventing, and prosecuting money laundering activities within the country. Moreover, they empower authorities to collaborate with foreign counterparts in cross-border investigations (Akter et al., 2023).

Some of the key AML laws to combat money laundering and terrorist financing. Some of the significant laws and regulations show in Table 5:

Table 5: Key AML Laws in Bangladesh

Laws	Explanation	Reference
Money Laundering Prevention Act, 2012 (MLPA)	This act provides the legal framework for preventing money laundering in Bangladesh. It defines money laundering offenses, establishes the AML Department, and outlines the duties and powers of various authorities involved in combating money laundering.	(Dhali, 2024)
Anti-Terrorism Act, 2009	It is primarily focused on preventing terrorism, this act also contains provisions related to combating the financing of terrorism. It empowers law enforcement agencies to investigate and prosecute individuals or organizations involved in terrorist financing activities.	(Nizzero, 2024)
Financial Intelligence Unit (FIU) Bangladesh	FIU Bangladesh, established under the MLPA, functions as the primary organization entrusted with the task of gathering, evaluating, and distributing financial intelligence pertaining to money laundering and terrorist funding.	(Shah, 2024)
Guidelines and Circulars by Bangladesh Bank	The central bank of Bangladesh, Bangladesh Bank, issues guidelines and circulars to banks and financial institutions to ensure compliance with AML regulations. These guidelines cover customer due diligence, reporting requirements, and suspicious transaction monitoring.	(Reza et al., 2024)
United Nations Security Council (UNSC) Resolutions	Bangladesh complies with multiple United Nations Security Council resolutions pertaining to the prevention and suppression of terrorism and the funding of terrorist activities. These resolutions establish global norms and responsibilities for member countries to address and prevent money laundering and terrorist funding operations.	(Akintayo et al., 2024)
Mutual Legal Assistance (MLA) Treaties	Bangladesh has established mutual legal assistance accords with multiple nations to enhance collaboration in the investigation and prosecution of money laundering and associated crimes. These accords facilitate the transfer of information and the provision of aid in legal procedures.	(Ochnio, 2024)

RECOMMENDATIONS OF THE STUDY

Using the PRISMA framework and researcher statement on publications and reports, the review intends to offer insights and recommendations to policymakers, practitioners, and researchers that are interested in utilizing AI for AML objectives (Usman et al., 2023).

Policy Framework Enhancement: Policymakers should contemplate revising current AML legislation to incorporate the assimilation of AI technologies. This may entail elucidating legal prerequisites and rules for the utilization of AI in AML, guaranteeing adherence to data privacy and security regulations, and fostering cooperation between regulatory entities and AI developers to construct optimal methodologies (Islam et al., 2024).

Investment in AI Technologies: Policymakers and industry stakeholders should give utmost importance to investing in AI research and development specifically for the aim of combating AML. This encompasses financial support for the creation of sophisticated AI algorithms, tools, and platforms designed specifically to meet the unique requirements of AML compliance.

Interdisciplinary Collaboration: It is essential for practitioners and researchers to work together across many fields such as AI, finance, law enforcement, and cybersecurity, in order to create comprehensive solutions for AML (Mani, 2019). Interdisciplinary teams can utilize a range of specialized knowledge to create and execute AI systems that efficiently identify and stop money laundering operations (Usman et al., 2023).

Enhancements: It should be implemented to enhance the accuracy and availability of data for AI-driven AML systems (Kute et al., 2021). This may need the establishment of data-sharing agreements among financial institutions, regulatory agencies, and law enforcement authorities, along with the implementation of data standards protocols to enable seamless communication and cooperation (Bhuiyan, 2019; Powelson, 2022).

Transparency and explain ability: There are essential algorithms in AI employed in AML to guarantee accountability and dependability (Bhuiyan, 2017; Sobh, 2020). It is important for practitioners to give priority to creating (Bhuiyan et al., 2024). AI models that are easy to understand and provide explicit explanations for their judgments. This will allow users to comprehend and verify the reasoning behind AML warnings and recommendations (Rahman et al., 2024).

Ongoing Surveillance and Assessment: AML systems driven by AI should be subject to regular monitoring and evaluation in order to gauge their effectiveness and performance (Kute et al., 2021). Practitioners must establish procedures for continuous testing, validation, and optimization of AI algorithms to adjust to changing money laundering risks and regulatory demands (Usman et al., 2023).

Capacity Enhancement and Training: It is essential to create training programs that enable AML experts to acquire the requisite expertise and understanding to proficiently utilize AI technologies (Usman et al., 2023). This encompasses instruction in data analysis, machine learning methodologies, and ethical factors in the implementation of AI for AML objectives (Garcia-Bedoya et al., 2021).

By applying these observations and suggestions, policymakers, practitioners, and researchers can collectively utilize the capabilities of AI to improve AML endeavors, reinforce the identification and prevention of financial crimes, and protect the credibility of the worldwide financial system (Usman et al., 2023).

CONCLUSIONS

Artificial Intelligence (AI) integration is a technology that has emerged as a promising solution to improve the identification and prevention of financial crimes in Anti-Money Laundering (AML) efforts (Garcia-Bedoya et al., 2021). The researcher's objective is to examine the present condition of AML (anti-money laundering), the influence of AI (artificial intelligence), the many roles involved, and the legislation, with the goal of attaining economic stability for the transition of Bangladesh into a smart nation by 2041. This systematic review study using the PRISMA framework to conduct a thorough analysis of the current literature regarding the use of

artificial intelligence (AI) in anti-money laundering (AML). The study specifically examines the risks, laws, and implications associated with AI in the setting of Bangladesh (Powelson, 2022). The review consolidates information from various sources, such as Web of Sciences, Scopus, PubMed, and DOAJ indexed articles and reports. It includes academic research, industry reports, and regulatory documents. The purpose is to evaluate the effectiveness, challenges, and ethical considerations related to AI-driven AML solutions. By employing a methodical search approach and strict criteria for selection, we identify and analyze past studies that are pertinent to shed light on significant patterns, approaches, and deficiencies in the present state of AI-powered anti-money laundering activities (Chen et al., 2018). The paper provides valuable insights and recommendations for policymakers, and researchers that are interested in effectively using AI technology to prevent money laundering, while simultaneously negotiating legal frameworks and protecting privacy rights. This paper contributes to the continuing discourse on the role of technology in addressing financial crime concerns in Bangladesh and abroad by conducting a critical examination of the nexus of AI, AML, and legal frameworks. The implementation of Anti-Money Laundering (AML) procedures in Bangladesh, as in other countries, is vital for combating financial misdeeds and upholding the integrity of the financial system.

LIMITATIONS AND FUTURE DIRECTIONS OF THE STUDY

The extent and accessibility of the current literature on the subject may constrain the study's findings and conclusions. We attempted a thorough examination using the PRISMA framework, but obstacles like language hurdles, publication bias, or access restrictions may have prevented the inclusion of certain relevant studies (Garcia-Bedoya et al., 2021). Differences in study techniques, sample sizes, and data sources might lead to bias or discrepancies when combining the results. The rapid advancements in AI technologies and AML processes may quickly render some of the evaluated literature obsolete. Advancements in AI algorithms, data analytics methodologies, and legal frameworks may make certain findings or suggestions no longer relevant. The study may not sufficiently consider ethical issues associated with the use of AI in AML, including privacy concerns, algorithmic bias, and the possibility of unforeseen effects (Bhuiyan, 2023).

Future research could be enhanced by conducting longitudinal studies that monitor the installation and efficacy of AI-driven AML solutions over an extended period of time. The collaboration among scholars from several fields, such as computer science, finance, law, and ethics, can enhance our comprehension of the intricate interaction between AI and AML. To ensure responsible and accountable deployment of AI in AML initiatives, it is crucial to conduct additional research on ethical considerations and stakeholder viewpoints.

REFERENCES

Ahmad, W., & Hussain, B. (2024). Shadow Economy and Environmental Pollution Nexus in Developing Countries: What is the Role of Corruption?. International Economic Journal, 1-19. https://doi.org/10.1080/10168737.2024.2331463

Akintayo, J., Njoku, E. T., & Romaniuk, S. N. (2024). Civil Society organisations and the Framing of United nations Counter-terrorism Financing Regulations. Countering Terrorist and Criminal Financing (pp. 43-52). CRC Press.

Akter, M. S., Bhuiyan, M. R. I., Poli, T. A., & Hossain, R. (2023). Web-based Banking Services on E-Customer Satisfaction in Private Banking Sectors: A Cross-Sectional Study in Developing Economy. Migration Letters, 20(S3), 894-911. https://doi.org/10.59670/ml.v20iS3.3976

Akter, M. S., Bhuiyan, M. R. I., Tabassum, S., Alam, S. A., Milon, M. N. U., & Hoque, M. R. (2023). Factors Affecting Continuance Intention to Use E-wallet among University Students in Bangladesh. https://doi.org/10.14445/22315381/IJETT-V71I6P228

Chakraborty, S., & Elahi, F. (2023). Comparison of soil salinity prediction by machine learning algorithms in coastal areas of Bangladesh. https://doi.org/10.22541/au.168899271.10982979/v1

Chakravorty, N. N. (2023). Corruption in Bangladesh: Background Causes and Current Scenario. Journal of Leadership, Accountability & Ethics, 20(1).

Chen, Z., Van Khoa, L. D., Teoh, E. N., Nazir, A., Karuppiah, E. K., & Lam, K. S. (2018). Machine learning techniques for anti-money laundering (AML) solutions in suspicious transaction detection: a review. Knowledge and Information Systems, 57, 245-285. https://doi.org/10.1007/s10115-017-1144-z

Chowdhury, M. U. (2022). 5. Role of financial inclusion on bank stability in Bangladesh. IIUC Business Review, 10(1). https://doi.org/10.3329/iiucbr.v10i1.62098

Cone, T. E. (2022). Learning with unobserved regimes. Journal of Macroeconomics, 73, 103441. https://doi.org/10.1016/j.jmacro.2022.103441

De Snaijer, J. (2024). Financial action task force (FATF). Elgar Encyclopedia of Crime and Criminal Justice. https://doi.org/10.4337/9781789902990.financial.action.task.force

Dhali, H. H. (2024). The Role of Coloniality, Decoloniality, and Education in Shaping Perspectives on Extremism: Exploring Perceptions Among Students in Bangladesh. Taylor & Francis.

Erp, J. V., & Linden, T. V. (2021). Silencing those who speak up against corporate power: Strategic lawsuits against public participation (SLAPPs) in Europe. European White-Collar Crime, 207-220. https://doi.org/10.1332/policypress/9781529212327.003.0013

Fagan, P. (2024). The enforcement of compliance. The Business of Cyber, 167-191. https://doi.org/10.1201/9781003380962-7

Frisse, M. E., & Misulis, K. E. (2019). Policies, laws, regulations, contracts, and procedures. Essentials of Clinical Informatics, 29-37. https://doi.org/10.1093/med/9780190855574.003.0005

Garcia-Bedoya, O., Granados, O., & Cardozo Burgos, J. (2021). AI against money laundering networks: the Colombian case. Journal of Money Laundering Control, 24(1), 49-62. https://doi.org/10.1108/JMLC-04-2020-0033

Gaviyau, W., & Sibindi, A. B. (2023). Global Anti-Money Laundering and Combating Terrorism Financing Regulatory Framework: A Critique. Journal of Risk and Financial Management, 16(7), 313. https://doi.org/10.3390/jrfm16070313

Haddaway, N. R., Page, M. J., Pritchard, C. C., & McGuinness, L. A. (2022). PRISMA2020: An R package and Shiny app for producing PRISMA 2020-compliant flow diagrams, with interactivity for optimised digital transparency and Open Synthesis. Campbell systematic reviews, 18(2), e1230. https://doi.org/10.1002/cl2.1230

Han, J., Huang, Y., Liu, S., & Towey, K. (2020). Artificial intelligence for anti-money laundering: a review and extension. Digital Finance, 2(3), 211-239. https://doi.org/10.1007/s42521-020-00023-1

Hidayati, H., & Sahri, F. (2023). Confiscation of asset proceedings from Corruptor money laundering for the use of legal action in returning loss of state property. Proceedings of the 3rd Multidisciplinary International Conference, MIC 2023, 28 October 2023, Jakarta, Indonesia. https://doi.org/10.4108/eai.28-10-2023.2341696

Islam, M. A., & Bhuiyan, M. R. I. (2022). Digital Transformation and Society. Available at SSRN: https://ssrn.com/abstract=4604376 or http://dx.doi.org/10.2139/ssrn.4604376

Islam, Z., Bhuiyan, M. R. I., Poli, T. A., Hossain, R., & Mani, L. (2024). Gravitating towards Internet of Things: Prospective Applications, Challenges, and Solutions of Using IoT. International Journal of Religion, 5(2), 436-451. https://doi.org/10.61707/awg31130

Kebbell, S. (2021). The suspicious activity reporting (SARs) regime. Anti-Money Laundering Compliance and the Legal Profession, 154-197. https://doi.org/10.4324/9780429019906-6

Khan, M. T. (2021). Journey towards sustainable banking and financial inclusion in Bangladesh through innovation. SD Conference PROCEEDINGS 2021. https://doi.org/10.52987/sdc.2021.004

Khanom, K., Islam, M. T., Hasan, A. A. T., Sumon, S. M., & Bhuiyan, M. R. I. (2022). Worker Satisfaction in Health, Hygiene and Safety Measures Undertaken by the Readymade Garments Industry of Bangladesh: A Case Study on Gazipur. Journal of Business Studies Pabna University of Science and Technology ISSN 2410-8170 2022, 3(1), 93–105. https://doi.org/DOI:10.58753/jbspust.3.1.2022.6

Kokkinis, A., & Miglionico, A. (2021). Money laundering and terrorist financing. Banking Law, 179-200. https://doi.org/10.4324/9781003133636-12

Kute, D. V., Pradhan, B., Shukla, N., & Alamri, A. (2021). Deep learning and explainable artificial intelligence techniques applied for detecting money laundering–a critical review. IEEE access, 9, 82300-82317. Doi:10.1109/ACCESS.2021.3086230

Latif, L. (2022). Intensifying the fight against corruption and money laundering in Africa. Latif, Lyla A,(2022), Study: Intensifying the fight against corruption and money laundering in Africa. United Nations, Office of the Special Adviser on Africa. http://dx.doi.org/10.2139/ssrn.4080273

Lin, Y., & Mâsse, L. C. (2021). A look at engagement profiles and behavior change: A profile analysis examining engagement with the Aim2Be lifestyle behavior modification app for teens and their families. Preventive Medicine Reports, 24, 101565. https://doi.org/10.1016/j.pmedr.2021.101565

Lisanawati, G. (2023). Unravelling legal issues related to financial transactions in money laundering. AML/CFT Journal: The Journal of Anti Money Laundering and Countering the Financing of Terrorism, 1(2), 183-204. https://doi.org/10.59593/amlcft.2023.v1i2.59

Lodge, H. D. (2020). Financial sanctions. Blackstone's Guide to The Sanctions and Anti-Money Laundering Act. https://doi.org/10.1093/oso/9780198844778.003.0003

Lokanan, M., & Maddhesia, V. (2023). Predicting suspicious money laundering transactions using machine learning algorithms. https://doi.org/10.21203/rs.3.rs-2530874/v1

Makumbe, R. .. (2023). Regulation and repression of civil society through the financial action task force (FATF) recommendation 8: How a restrictive interpretation limits civil society contributions to development in Africa. https://doi.org/10.15868/socialsector.42030

Mani, L. (2019). An Analysis of loan portfolio of Janata Bank Limited. Available at SSRN 4644687. or http://dx.doi.org/10.2139/ssrn.4644687

Marotta, A., & Madnick, S. (2023). Decoding cyber incident reporting requirements: A cross-regulatory examination. 2023 10th International Conference on Future Internet of Things and Cloud (FiCloud). https://doi.org/10.1109/ficloud58648.2023.00061

Milon, M. N. U., & Zafarullah, H. (2024). Uncovering the depths of trade-based money laundering: evidence from a seaport in Bangladesh. Journal of Money Laundering Control, 27(3), 604-618. https://doi.org/10.1108/JMLC-03-2023-0063

MILON, M. N. U., KAMAL, Y., & POLI, T. A. (2023). Supremacy of Value-Added Tax: A Perspective from South Asian Nations. The Journal of Asian Finance, Economics and Business (JAFEB), 10(2), 49-60. doi:10.13106/jafeb.2023.vol10.no2.0049

Molla, C., Mani, L., Bhuiyan, M. R. I., & Hossain, R. (2023). Examining the Potential Usages, Features, and Challenges of Using ChatGPT Technology: A PRISMA-Based Systematic Review. Migration Letters, 20(S9), 927-945. https://doi.org/10.59670/ml.v20iS9.4918

Mzukisi Niven Njotini. (2021). The transaction or activity monitoring process: An analysis of the customer due diligence systems of the United Kingdom and South Africa. Obiter, 31(3). https://doi.org/10.17159/obiter.v31i3.12324

Neimane, L. (2023). Criminal Legal and Procedural Problems and Prospects for Improvement in Preventing and Combating Money Laundering. Summary of the Doctoral Thesis. https://doi.org/10.25143/prom-rsu_2023-13_dts

Nizzero, M. (2024). Anti-Money Laundering and Countering Terrorist Financing from an IR, Criminology, and Compliance Perspective: A Theoretical Marriage of Convenience. In Countering Terrorist and Criminal Financing (pp. 19-30). CRC Press. eBook ISBN: 9781003092216

Ochnio, A. H. (2024). Recent developments in EU anti-corruption strategy: the missing element of the return of corrupt assets to "victim countries". Journal of Money Laundering Control, 27(7), 1-12. https://doi.org/10.1108/JMLC-11-2023-0176

Pavlidis, G. (2023). Deploying artificial intelligence for anti-money laundering and asset recovery: the dawn of a new era. Journal of Money Laundering Control, 26(7), 155-166. https://doi.org/10.1108/JMLC-03-2023-0050

Pereverzyeva, O., & Gadjiev, V. (2020). Features of legal nature financial action task force on money laundering FATF. Law Review of Kyiv University of Law, (3), 370-374. https://doi.org/10.36695/2219-5521.3.2020.68

Powelson, K. (2022). The impact of artificial intelligence on anti-money laundering programs to detect and prevent financial crime (Doctoral dissertation, Utica University).

Radi, J. K., Dent, R. A., Allen, C. A., Anderson, J. A., Atkins, J. B., & Kozlik, J. (2024). The weapons of mass destruction-civil support team PA. JAAPA, 37(2), 1-5. DOI: 10.1097/01.JAA.0000995656.06965.36

Rahman, M. M., Bhuiyan, M. R., & Alam, S. M. (2024). The Empirical Study on the Impact of the COVID-19 on Small and Medium Enterprises (SMEs) in Bangladesh. Journal of Information Systems and Informatics, 6(1), 527-547. https://doi.org/10.51519/journalisi.v6i1.686

Reza, F., & Islam, M. S. Kaium Siddik Anando (2024). Money Laundering Hinders the Growth of the Economy of a Country. Saudi J Econ Fin, 8(1), 9-13. DOI: 10.36348/sjef.2024.v08i01.002

Sakib, N. H. (2021). Corruption Prevention through Community Organizing:: The Case of CCCs and YES Groups of Transparency International Bangladesh. Bangladesh Journal of Public Administration, 29(1), 1-25.

Sakib, N. H., & Mollik, M. M. (2023). Patterns of Corruption During COVID-19 in Bangladesh. https://doi.org/10.21203/rs.3.rs-3380296/v1

Schneider, F. (2021). Economic and financial crime: Corruption, shadow economy, and money laundering: Book review. Written by Monica Violeta Achim and Sorin Nicolae Borlea. Springer nature: Cham, Switzerland, 2021. ISBN 978-3-030-51780-9. Risks, 9(4), 71. https://doi.org/10.3390/risks9040071

Shah, K. M. (2024). Anti Money Laundering: Proactive involvement and perception of Internal Auditors in Anti-Money Laundering Compliance Review (Doctoral dissertation, GUJARAT TECHNOLOGICAL UNIVERSITY AHMEDABAD).

Shaikh, A. K., Al-Shamli, M., & Nazir, A. (2021). Designing a relational model to identify relationships between suspicious customers in anti-money laundering (AML) using social network analysis (SNA). Journal of Big Data, 8(1). https://doi.org/10.1186/s40537-021-00411-3

Sobh, T. S. (2020). An intelligent and secure framework for anti-money laundering. Journal of Applied Security Research, 15(4), 517-546. https://doi.org/10.1080/19361610.2020.1812994

Sullivan, K. (2023). Building a quality AML program for financial institutions. Anti-Money Laundering in a Nutshell, 95-126. https://doi.org/10.1007/979-8-8688-0066-5_5

Sultan, N., & Mohamed, N. (2022). Financial intelligence unit of Pakistan: An evaluation of its performance and role in combating money laundering and terrorist financing. Journal of Money Laundering Control, 26(4), 862-876. https://doi.org/10.1108/jmlc-04-2022-0060

Sultan, N., Mohamed, N., Said, J., & Mohd, A. (2023). The sustainability of the international AML regime and the role of the FATF. The objectivity of the greylisting process of developing jurisdictions like Pakistan. Journal of Money Laundering Control, 27(1), 76-92. https://doi.org/10.1108/jmlc-12-2022-0166

Truntsevsky, Y., & Dolganov, S. (2021). Anti-money laundering by restricting financial transactions. Proceedings of the VII International Scientific-Practical Conference "Criminal Law and Operative Search Activities: Problems of Legislation, Science and Practice". https://doi.org/10.5220/0010625100003152

Usharani, B. (2022). Machine learning and deep learning techniques for phishing threats and challenges. Cyber-Physical Systems, 123-146. https://doi.org/10.1002/9781119836636.ch6

Usman, A., Naveed, N., & Munawar, S. (2023). Intelligent anti-money laundering fraud control using graph-based machine learning model for the financial domain. Journal of Cases on Information Technology, 25(1), 1-20. DOI: 10.4018/JCIT.316665

Van Thai, H. (2023). Combating money laundering in Vietnam–The role of the police force. URI http://pea.lib.pte.hu/handle/pea/44500

Vijayan, A. (2023). A prompt engineering approach for structured data extraction from unstructured text using conversational LLMs. 2023 6th International Conference on Algorithms, Computing and Artificial Intelligence. https://doi.org/10.1145/3639631.3639663

Wang, D. (2020). Impact on the firm value of financial institutions from penalties for violating anti-money laundering and economic sanctions regulations. https://doi.org/10.26226/morressier.5f0c7d3058e581e69b05cf7b