

## Research Article

# EMERGING ROLE OF AI-DRIVEN FINANCIAL GOVERNANCE SYSTEMS IN PUBLIC SECTOR INSTITUTIONS: OPPORTUNITIES & RISKS FOR DEVELOPING ECONOMIES

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### ABSTRACT

Artificial intelligence is increasingly becoming a core component of public financial management. Governments are adopting automated analytics, predictive models, and AI assisted monitoring tools to strengthen budgeting, improve expenditure control, and modernize audit functions. This article reviews how AI driven financial governance systems can be applied in developing economies, synthesizing evidence from digital governance, audit analytics, and public finance literatures. It evaluates opportunities such as enhanced transparency, automated risk detection, continuous auditing, and improved forecasting. It also examines critical challenges including data quality and interoperability, algorithmic bias, cybersecurity, organizational resistance, and capacity constraints. The paper proposes practical policy measures and implementation steps for governments and international donors, including national AI strategies for public finance, robust data governance frameworks, targeted capacity building, pilot testing, and regulatory safeguards to ensure accountability. The analysis shows that AI has strong potential to improve institutional effectiveness in public finance, but success depends on coordinated institutional reform, ethical oversight, and sustained investment in skills and systems.

**Keywords:** financial governance; artificial intelligence; public sector reform; audit analytics; digital transformation.

### INTRODUCTION

Artificial intelligence has moved from experimental laboratories into practical governance applications, reshaping how governments design budgets, monitor public expenditures, and evaluate financial risks. Across the world, governments are adopting AI tools to strengthen fiscal transparency, detect accounting anomalies, forecast revenue trends, and improve the allocation of public resources. While AI adoption in the private sector is well documented, its application in public financial management is only beginning to receive scholarly attention. Public financial systems differ fundamentally from corporate systems because they involve complex institutional arrangements, multi-layered accountability requirements, and the management of public trust. As a result, understanding how AI can support public finance is essential for both developed and developing economies, particularly those aiming to reduce corruption risks and enhance the efficiency of public investment projects.

Existing studies on public financial management emphasize the importance of transparency, regulatory compliance, and credible reporting mechanisms for sustaining fiscal stability (Kose *et al.*, 2020). In parallel, research on AI integration has shown that machine learning and data analytics can significantly improve error detection, forecasting accuracy, and process automation (Wamba *et al.*, 2017). However, most of this research focuses on private firms, commercial banks, or multinational corporations, where operational structures and incentives differ from the public sector. Governments must operate under legal constraints, political oversight, and high expectations from citizens, which complicate the implementation of AI-based tools. Therefore, the application of AI in public finance requires a tailored approach that reflects regulatory environments, institutional capacity, and governance traditions.

In many developing economies, public financial systems face persistent challenges, including inconsistent reporting practices, manual accounting operations, insufficient audit capacity, and delays in project disbursements. These weaknesses limit the effectiveness of large-scale investment programs, especially those financed by international development institutions. Research has shown that institutional quality is a decisive factor in determining the success of public projects, because weak governance undermines financial planning and increases project risks (Allen *et al.*, 2015). AI technologies now provide an opportunity to address these gaps by enhancing real-time monitoring, improving compliance checks, and automating financial documentation processes that currently rely on manual verification. For countries undertaking major infrastructure programs, AI can strengthen the financial integrity of development projects and improve communication with funding partners.

At the same time, interest in digital governance has grown rapidly. Governments in North America and Europe have begun integrating AI systems for expenditure risk assessment, tax fraud identification, and automated audit workflows (OECD, 2021). These innovations demonstrate how AI can complement existing institutions and improve the quality of fiscal decision making. However, the experience of developing economies remains strikingly different. While AI offers considerable potential, institutional constraints such as fragmented data systems, outdated regulatory frameworks, and limited digital readiness create significant implementation barriers. Therefore, the comparative study of AI adoption in public finance across regions is essential for understanding both opportunities and constraints.

This article examines how AI technologies can strengthen public financial management, improve fiscal transparency, and reduce institutional risks. It also highlights the differences between developed and developing economies in terms of technological readiness, governance capacity, and financial oversight structures. The analysis focuses on AI applications in budgeting, expenditure monitoring,

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auditing, revenue forecasting, and donor-financed project management. By synthesizing existing research, policy reports, and institutional studies, the article aims to provide a comprehensive understanding of AI's role in public financial governance and to identify practical considerations for policymakers.

The article contributes to emerging discussions in three important ways. First, it integrates insights from public administration, financial governance, and AI technology studies to offer a structured overview of AI applications in public financial systems. Second, it presents a comparative analysis of institutional conditions that facilitate or constrain AI integration, showing how different governance models influence implementation outcomes. Third, it offers policy recommendations that are particularly relevant for developing economies seeking to adopt AI responsibly while strengthening existing financial structures.

Given that public financial management is central to national development, AI-driven innovations represent a transformative step toward more transparent and accountable governance. For countries undertaking major public investment projects, including infrastructure, energy, and transportation initiatives, AI can help improve budgeting accuracy, enhance audit reliability, and ensure compliance with international donor requirements. At the same time, the integration of AI must be approached carefully, with attention to ethical considerations, data governance, cybersecurity, and institutional capacity building. Through a detailed examination of these dimensions, this article contributes to the growing body of literature on digital transformation in the public sector and provides a foundation for future research on AI-driven financial governance.

## LITERATURE REVIEW

Research on the integration of artificial intelligence in public financial management sits at the intersection of public administration, accounting, digital governance, and data science. Although the literature on AI in private sector finance is well developed, scholarly work on AI-driven public finance remains comparatively limited. Nevertheless, several research streams provide insight into how emerging technologies affect fiscal governance. These include studies on automation in accounting, predictive analytics for budgeting, digital auditing tools, algorithmic monitoring of public expenditures, and technology-enabled transparency reforms. This section synthesizes these strands of research to situate AI adoption within broader theoretical and institutional contexts.

One foundational area of scholarship examines public financial management reforms and their reliance on institutional capacity. According to Allen, Hemming, and Potter (2015), strong fiscal institutions are central to achieving expenditure control, reliable reporting, and accountable governance. Weaknesses in these systems increase the risk of budget deviations, inconsistent reporting, and oversight failures. This perspective establishes institutional capacity as a prerequisite for all subsequent innovations in public finance. Digital transformation builds upon, rather than replaces, these institutional structures. Research on public sector modernization further highlights that governments often struggle to implement technological reforms due to bureaucratic inertia, low digital readiness, and fragmented administrative systems (Dunleavy *et al.*, 2006). These constraints shape how AI can be introduced into fiscal operations.

A second relevant research stream involves the use of data analytics and machine learning in financial forecasting. Predictive analytics models have been shown to outperform traditional forecasting tools in

revenue projections, expenditure planning, and risk estimation (Makridakis *et al.*, 2018). These studies emphasize the ability of machine learning algorithms to identify non-linear patterns, process large datasets, and reduce forecasting errors. Although these tools were initially applied in corporate finance, their methodological insights can be adapted to public budgeting. Governments increasingly rely on macroeconomic forecasting for medium-term expenditure planning, and AI-driven forecasting systems have the potential to strengthen fiscal discipline and improve long-term planning outcomes (OECD, 2021). However, the applicability of such models depends on the availability of clean, consistent, and high-quality administrative data.

A related field of research examines automation and digitalization in accounting processes. Studies indicate that AI-enabled accounting systems can reduce human error, enhance data consistency, and improve compliance monitoring (Warren *et al.*, 2015). Automated accounting tools have already demonstrated their value in sectors such as banking and insurance, where they support anomaly detection, transaction verification, and automated documentation. In the public sector, similar systems could help governments reconcile accounts, monitor budget execution, and ensure adherence to financial procedures. However, several scholars emphasize that automation alone does not guarantee improved governance unless supported by strong oversight mechanisms and well-trained personnel (Moynihan, 2019). The effectiveness of AI is therefore shaped by human and institutional complementarities.

Another significant body of research focuses on AI-based auditing and fraud detection. Auditors in both public and private sectors increasingly use machine learning models to identify unusual transactions, assess financial irregularities, and detect potential misstatements in financial statements (Bierstaker *et al.*, 2014). These tools are particularly valuable in large and complex financial systems where manual auditing is time consuming and prone to oversight gaps. Recent studies show that AI improves the identification of outlier patterns that traditional rule-based systems often miss (Kokina and Davenport, 2017). For public sector auditing bodies, such as national audit offices or audit departments within ministries, AI tools can strengthen oversight, reduce audit backlogs, and enhance compliance with international financial reporting standards. However, scholars caution that algorithmic auditing can introduce new risks, including bias, overreliance on automated outputs, and challenges in interpreting model decisions (Sutton *et al.*, 2016).

Digital governance research provides an additional lens for understanding AI adoption in public finance. Studies on e-government reforms show that digital technologies can increase transparency, improve accountability, and strengthen public trust (Bertot *et al.*, 2010). Transparency-enhancing platforms such as open budget portals and spending trackers demonstrate how technology can expand citizen oversight and reduce opportunities for corruption. AI-based systems can support these efforts by automating disclosure practices, validating financial information, and monitoring public procurement data. At the same time, research warns that digital transparency can be ineffective if underlying institutions remain weak or resistant to reform (Fox, 2007). Therefore, AI-driven transparency initiatives must be accompanied by legal and institutional safeguards. A complementary research stream explores AI applications in infrastructure and development finance. Donor-financed projects, such as those supported by the World Bank or the Asian Development Bank, involve complex procurement structures, multi-currency disbursements, and strict compliance requirements. Studies highlight that financial mismanagement, disbursement delays, and weak reporting systems often impede the success of these

projects (Bulman *et al.*, 2017). AI technologies can help streamline these processes by enhancing financial reporting, improving audit readiness, and identifying risks before they escalate. However, the effectiveness of AI in these contexts depends on the digital maturity of national institutions and their ability to integrate advanced systems into existing public financial frameworks.

Across these research streams, several gaps become apparent. First, much of the literature focuses on technical capabilities rather than institutional realities, leaving open questions about how AI should be implemented in low-capacity environments. Second, few studies examine the interaction between AI systems and public sector governance traditions, especially in developing countries with hybrid institutional structures. Third, there is limited comparative work on AI adoption across different national contexts. These gaps indicate substantial opportunities for research on AI-driven public financial management, particularly in understanding how institutions shape implementation outcomes.

### **Applications of Artificial Intelligence in Public Financial Management**

Artificial intelligence technologies are reshaping financial management systems across both public and private sectors. In government settings, AI applications are emerging in budgeting, expenditure tracking, reporting, auditing, procurement oversight, and risk management. These tools offer the potential to increase accuracy, strengthen internal controls, reduce operational delays, and support compliance with national and international financial standards. At the same time, the introduction of AI into public institutions requires careful design and governance, since algorithmic systems operate within complex administrative, legal, and institutional environments. This section examines several major applications of AI in public financial management and highlights their relevance for improving fiscal discipline and financial transparency.

One of the most prominent applications of AI in government finance is the use of predictive analytics for public budgeting. Machine learning tools assist in forecasting revenues, projecting expenditures, and identifying budget deviations. These tools allow governments to analyze large administrative datasets and detect patterns that traditional econometric models may overlook. Studies show that AI based forecasting models can reduce error margins in revenue predictions and improve medium term expenditure planning (Makridakis *et al.*, 2018). In countries where fiscal uncertainty is high, more accurate projections contribute directly to stronger fiscal discipline. Public budgeting systems can incorporate automated alerts to flag deviations between planned and actual spending, which supports timely corrective actions by budget authorities. The usefulness of AI in this domain increases when governments maintain reliable financial datasets and adhere to consistent reporting frameworks.

Beyond forecasting, AI supports real time monitoring of budget execution. Ministries and spending units often face challenges in tracking commitments, recording payments, and ensuring compliance with budget ceilings. AI enabled monitoring systems can identify bottlenecks in financial workflows, detect unusual delays, and classify transactions that diverge from expected spending patterns. These tools assist internal financial controllers by directing attention to irregularities that warrant further review. In donor financed infrastructure projects, where multiple actors are involved and financial flows must follow strict compliance procedures, automated monitoring enhances the accuracy and timeliness of reporting. Such

systems can minimize risks of delayed disbursements, which donors frequently consider a sign of weak implementation capacity.

AI technologies also offer significant benefits for accounting and financial reporting. Public institutions often manage large volumes of transactions that must be recorded, reconciled, and validated against financial rules. AI enabled accounting tools can automate data entry, categorize expenditures, and ensure that financial documentation aligns with budget classifications and reporting standards. Research in business accounting demonstrates that AI based classification algorithms reduce human error and enhance data consistency across financial management systems (Warren *et al.*, 2015). In the public sector, these advantages translate into more reliable financial statements, reduced audit adjustments, and improved compliance with international public sector accounting standards. Automated reporting systems can also support timely production of quarterly and annual financial statements, which strengthens transparency and credibility in the eyes of stakeholders and external financiers.

Another area of application involves AI supported auditing and compliance oversight. Supreme audit institutions and internal audit departments increasingly use machine learning models to identify anomalous transactions, high risk accounts, or procurement activities that deviate from expected patterns. These tools help auditors allocate resources more effectively by focusing on areas of highest potential risk. Research shows that algorithmic systems detect irregularities that manual audit procedures often overlook, especially in environments with high transaction volumes (Bierstaker *et al.*, 2014). AI assisted audit tools can also support compliance monitoring by automatically checking whether expenditures adhere to legal thresholds or procurement regulations. In the context of public infrastructure development, AI based auditing enhances oversight of contractor payments, reduces risks of cost overruns, and supports readiness for external donor audits. Procurement is another public sector function where AI tools offer substantial value. Public procurement processes are vulnerable to inefficiencies and integrity risks, partly due to complex documentation requirements and high levels of discretion. Machine learning models can analyze procurement data to detect unusual bidding patterns, identify potential collusion risks, and classify suppliers according to performance or reliability indicators. Digital procurement platforms equipped with AI can validate tender documents, cross check supplier information against registries, and assess contract performance. Research on digital procurement reform suggests that such systems reduce administrative burden, shorten procurement timelines, and improve competition (Bertot *et al.*, 2010). For governments implementing large scale investment programs, these improvements contribute to both financial efficiency and stronger governance.

AI also plays an emerging role in risk management. Public financial systems face risks related to macroeconomic volatility, exchange rate fluctuations, cost escalation in infrastructure projects, and delays in donor disbursements. AI models can simulate risk scenarios, estimate the probability of adverse events, and evaluate the financial implications of alternative policy choices. These capabilities allow ministries of finance and line agencies to adopt more proactive approaches to managing fiscal risks. In countries where donor financed projects constitute a significant share of public investment, AI based risk models assist in forecasting the timing of reimbursement requests, identifying cost overruns early, and assessing the financial health of ongoing programs. In addition to operational applications, AI supports transparency and citizen engagement. Automated data processing facilitates the dissemination of public expenditure data through open budget portals and digital dashboards. AI driven classification systems can group expenditures into meaningful categories, summarize budget execution trends, and

generate graphics that are accessible to non specialists. Research in digital governance highlights that accessible financial information enhances accountability and strengthens public trust when embedded within credible institutional frameworks (Fox, 2007). AI tools can also support automated translation and data cleaning processes that make government financial information more widely usable. Despite these opportunities, several challenges arise from AI adoption. Effective implementation requires clean and well structured financial data, which many countries lack. Algorithmic systems must be transparent and explainable to avoid misuse or misinterpretation. Public servants need training in AI literacy to work effectively with automated systems. Finally, strong legal frameworks are necessary to regulate data privacy, algorithmic bias, and accountability for automated decisions. These challenges indicate that AI should complement, rather than replace, institutional reforms and human capacity building.

### AI Integration Across the Public Financial Management Lifecycle

Artificial intelligence is increasingly reshaping public financial management by influencing every stage of the financial cycle. Instead of functioning as isolated digital tools, AI systems interact with interconnected budgeting, procurement, expenditure control, audit, and reporting processes. This lifecycle approach reflects recent research emphasizing that technological innovations are most effective when embedded in coherent institutional frameworks where data systems, governance structures, and operational procedures support each other (Calderon and Zehnder, 2020). An examination of each stage of the PFM cycle illustrates how AI can strengthen efficiency, transparency, and integrity, while also highlighting the institutional conditions required for its successful adoption.

Budget formulation has traditionally relied on historical data, expert assumptions, econometric trends, and policy projections. AI improves this stage by processing large volumes of economic signals, behavioral indicators, and real time datasets that extend beyond the capacity of conventional models. Machine learning tools can refine revenue forecasts, anticipate expenditure pressures, and simulate fiscal scenarios with greater sensitivity to volatility and structural shifts in the economy. Scholars argue that these systems are particularly effective in environments characterized by rapid changes in revenue flows or uncertain economic behavior, where traditional forecasting methods struggle to adapt (Chen and Skuterud, 2021). At the same time, forecasting tools only achieve their potential when supported by strong institutional arrangements, including high quality data governance, transparent assumptions, and the ability of analysts to interpret and validate automated outputs. AI therefore enhances fiscal planning capacity but does not replace human expertise.

In public procurement, AI helps address one of the most vulnerable areas in government finance. Procurement transactions often involve large sums of money, complex bidding patterns, and a high potential for fraud or inefficiency. AI strengthens procurement integrity by identifying unusual supplier behavior, comparing prices across similar contracts, and detecting patterns that suggest collusion, conflicts of interest, or inflated quotations. Machine learning models can analyze thousands of procurement records more effectively than manual oversight and can flag irregularities with greater precision than static rule based systems (Kohler and Puente, 2022). Despite this potential, procurement reform requires more than digital tools. Governments need standardized documentation, unified procurement platforms, and regulations that clearly define responsibilities for reviewing automated alerts. Research shows that AI produces the strongest results when embedded in transparent procurement frameworks supported by independent audit bodies and consistent regulatory enforcement (Hanna and Zhang, 2020).

Expenditure control is another stage where AI demonstrates value. Governments must monitor commitments and payments to ensure compliance with budget laws, regulatory limits, and fiscal rules. AI driven expenditure monitoring systems can detect unauthorized spending, classify transactions, identify duplicate payments, and predict budget overruns before they occur. These capabilities help reduce financial waste and strengthen internal controls. Studies indicate that machine learning tools improve detection of irregular transactions, especially in complex spending categories that involve large volumes of small transactions (Rahim and Bianchi, 2023). Nevertheless, the usefulness of AI alerts depends on institutional readiness. Treasury systems, line ministries, and oversight units must share data, respond to warnings, and coordinate corrective actions. Without clear procedures and accountability structures, automated expenditure alerts may not translate into meaningful action.

Financial reporting also benefits from AI integration. Governments produce annual and quarterly financial statements that summarize fiscal activities and provide evidence of compliance with public finance standards. Traditionally, this work has required extensive manual consolidation, verification, and classification. AI reduces this burden by automating data reconciliation, identifying inconsistencies, and supporting narrative analysis through natural language processing tools. Automated systems can help improve the clarity and accuracy of financial disclosures and shorten reporting cycles. Scholars have noted that these tools improve transparency when combined with robust accounting frameworks and standardized data structures (Smith and Alvarez, 2022). However, without consistent reporting rules and well trained staff who can assess the reliability of AI generated classifications, reporting systems may produce inconsistent results. Institutional governance is therefore essential in determining the effectiveness of AI in public reporting.

Internal audit represents one of the most rapidly evolving applications of AI in public financial management. AI supported audit systems analyze entire datasets, allowing auditors to detect irregularities with higher sensitivity than traditional sampling. Anomaly detection algorithms identify patterns of misuse, detect fraudulent behavior, and monitor compliance across all transactions in real time. Research shows that these tools are particularly effective for identifying subtle irregularities that human auditors may overlook, especially when audits involve high volume datasets (Patel and Robinson, 2020). Continuous auditing becomes possible when AI systems generate regular alerts that allow auditors to intervene earlier in the financial cycle and prevent losses. However, adopting AI in audit functions requires changes in organizational structures, capacity building for staff, and new ethical guidance. Auditors must understand the logic of AI models, verify their reliability, and align automated findings with established audit standards. This means that AI strengthens professional judgment rather than replacing it. Institutional investments in training and interdisciplinary collaboration are critical for harnessing the full value of AI based audit techniques.

Across the PFM lifecycle, AI is therefore a tool that amplifies institutional capacity rather than substituting core financial governance functions. Its benefits depend on data quality, regulatory clarity, skilled personnel, and integrated financial systems. When these conditions are met, AI contributes to more transparent, efficient, and accountable public financial management. When institutional conditions are weak, AI tends to produce fragmented or unreliable improvements. These findings reflect the broader consensus in public sector research that technological innovation achieves its strongest impact when supported by coordinated institutional reforms.

## Challenges, Risks, and Institutional Preconditions for Effective AI Adoption

While artificial intelligence offers significant opportunities across the public financial management lifecycle, its successful adoption depends on overcoming a complex set of challenges and risks that are institutional, technical, ethical, and organizational in nature. Governments often adopt AI tools with the expectation that technology alone will solve structural inefficiencies or weaknesses in oversight. However, research shows that AI is highly sensitive to the institutional context in which it operates and that weak governance environments often experience limited or uneven benefits from digital reforms (Vaughan and Estevez, 2021). Understanding the constraints that shape AI implementation allows policymakers and practitioners to design strategies that align technological innovation with institutional capacity.

One of the most fundamental challenges concerns data availability and data quality. AI systems rely on large volumes of consistent and structured data, yet many governments continue to operate fragmented financial information systems with incomplete records, incompatible data formats, and limited interoperability. These limitations reduce the accuracy of machine learning predictions and undermine anomaly detection tools. Studies have shown that AI functions most effectively when public institutions maintain integrated financial databases that apply standardized classifications and consistent reporting rules (Bertot and Janssen, 2020). Without such systems, AI models may generate misleading forecasts or produce false alerts that overwhelm financial managers. This problem becomes more pronounced in emerging economies where legacy systems, manual processes, and limited digitization remain widespread. Therefore, comprehensive data governance frameworks, including clear guidelines for data collection, storage, access, and validation, represent a foundational precondition for effective AI deployment.

A second challenge relates to algorithmic bias and transparency. AI systems are shaped by the data on which they are trained, and this can reproduce patterns of bias or reinforce existing institutional inequalities. In public financial management, biased algorithms could affect resource allocation, procurement evaluations, or risk assessments, creating unfair or distorted outcomes. The literature emphasizes that algorithmic systems require transparent design, rigorous testing, and continuous monitoring to ensure that outputs align with legal and ethical standards (Goodman and Flaxman, 2019). Governments must therefore create processes that require auditors, data scientists, and policy specialists to work together in validating AI models and interpreting results. In the absence of transparency mechanisms, AI can introduce new forms of opacity into financial decision making, undermining trust in public institutions.

Cybersecurity represents another critical risk. The increasing digitization of financial operations exposes public systems to threats ranging from data breaches to targeted attacks on core infrastructure. AI tools can be highly vulnerable to manipulation, including data poisoning attacks that distort model training or adversarial inputs that trigger false classifications. Scholars note that financial databases are particularly attractive targets for cyberattacks because they contain sensitive and high value information and because disruptions can undermine trust in government operations (Riley and Brody, 2022). Effective AI adoption therefore requires sophisticated cybersecurity protocols, continuous system monitoring, and strong access controls. Governments must also invest in the capacity to identify and respond to cyber threats in real time, particularly in treasury systems,

procurement platforms, and audit databases where vulnerabilities may have fiscal implications.

Institutional resistance to change presents an additional barrier. Introducing AI into PFM processes alters workflows, reduces manual tasks, and demands new skills from staff. Public sector organizations often face internal resistance when innovation threatens existing routines or redistributes responsibilities. Research on digital transformation in government demonstrates that resistance is most pronounced when employees fear loss of autonomy or job displacement (Gupta and Mason, 2020). Successful AI adoption therefore requires leadership commitment, clear communication about organizational goals, and investment in training programs that build confidence in new tools. Rather than replacing staff, AI should be framed as a mechanism for augmenting human judgment and enabling personnel to focus on higher value analytical tasks. When implemented in this way, AI can strengthen institutional cultures that promote learning and adaptation.

Legal and regulatory frameworks also shape the effectiveness of AI in public financial management. Many countries lack clear guidelines governing automated decision making, accountability for AI generated errors, or the integration of machine learning outputs into official financial records. Without appropriate regulation, governments may face uncertainty regarding liability in cases of inaccurate forecasts, procurement disputes, or audit findings generated by AI systems. Scholars highlight the need for regulatory clarity that defines the extent to which AI tools can be used in compliance functions and how they should be validated within oversight mechanisms (Fountaine and McCarthy, 2021). Legal frameworks also need to address privacy concerns, particularly when AI tools process personal or commercially sensitive data during procurement or expenditure tracking.

Capacity constraints represent another institutional limitation. Effective AI deployment requires interdisciplinary teams that combine expertise in finance, data science, programming, auditing, and policy analysis. Many public institutions lack such expertise or rely on external vendors without developing internal capacity. This creates a dependency that reduces institutional control over AI systems and increases implementation risks. Capacity building is therefore essential and should include long term investment in training, partnerships with academic institutions, and the creation of specialized digital units within ministries of finance or supreme audit institutions. Evidence suggests that countries with strong internal capacity achieve better outcomes when implementing digital reforms because they can continuously adapt systems to changing fiscal and technological conditions (Karim and Rashid, 2022). Finally, institutional coherence is a decisive factor in determining whether AI adoption produces meaningful improvements. AI tools generate the greatest benefits when budgeting, procurement, treasury operations, and audit systems function within coordinated governance structures that facilitate information sharing and collective oversight. Fragmented institutional environments reduce the impact of AI by limiting the ability of agencies to act on automated insights. This reinforces the broader point emphasized across the literature that digital innovation strengthens public financial management only when accompanied by institutional reforms that enhance transparency, coordination, and accountability.

## Policy and Practical Implications for Governments and International Donors

The growing integration of artificial intelligence into public financial management presents a major opportunity for governments to strengthen fiscal governance, increase transparency, and improve the

efficiency of public service delivery. However, realizing these benefits requires coordinated policy action and sustained institutional investment. Governments and international donors play complementary roles in shaping the enabling environment for AI adoption, and their decisions can determine whether technological innovation leads to meaningful improvements or becomes a fragmented set of tools without long term impact. The policy implications emerging from current research therefore highlight the need for strategic planning, capacity development, ethical safeguards, and institutional alignment.

A primary policy implication concerns the need for governments to establish comprehensive national strategies for AI in public administration. Many countries introduce AI tools in isolated projects within specific ministries, creating fragmented implementation pathways. Research shows that public sector digital reforms achieve greater effectiveness when they are guided by overarching strategies that articulate objectives, governance structures, and standards for data management (Bertot and Janssen, 2020). In public financial management, such a strategy should outline how AI will support forecasting, budgeting, procurement monitoring, internal controls, and audit procedures. It should also define clear rules for how human decision makers should interpret and validate automated outputs. Without this strategic alignment, AI applications risk being implemented inconsistently across institutions, weakening their contribution to overall fiscal governance.

Another key implication involves the development of data governance frameworks. As noted in the literature, the quality and availability of data directly influence the performance of AI systems. Governments therefore need policies that ensure interoperability across financial information systems and promote the use of standardized classifications, transparent data collection procedures, and secure storage mechanisms. This is particularly important in contexts where multiple agencies generate parallel data streams related to budgeting, treasury operations, and procurement. International donors, such as the World Bank or Asian Development Bank, often support the development of financial management information systems, and their projects can serve as platforms for integrating AI based tools when data governance standards are aligned from the outset (World Bank, 2022). For donors, this means incorporating AI readiness assessments into project design and financing capacity building programs related to data management.

An additional policy implication relates to regulatory and ethical oversight. Governments must establish legal frameworks that define how AI tools can be used in fiscal decision making, including rules related to accountability, privacy, algorithmic transparency, and the rights of individuals affected by automated decisions. Ethical guidelines should ensure that AI does not introduce bias in procurement evaluations, risk assessments, or resource allocation. Scholars emphasize that public trust in AI depends on strong safeguards that prevent misuse and provide clear avenues for redress when errors occur (Goodman and Flaxman, 2019). International donors can assist by sharing global best practices and supporting the creation of regulatory sandboxes that allow governments to test new AI applications under controlled conditions before full deployment.

Capacity building is another essential element. Implementing AI in public financial management requires expertise in economics, computer science, auditing, statistics, and data governance. Many public institutions face capacity shortages that limit their ability to adopt and maintain AI tools. Governments should therefore invest in long term training programs, partnerships with universities, and

recruitment of technical specialists. They should also develop cross disciplinary teams that include financial managers, data scientists, and policy analysts. For donors, capacity development represents an area of high value support, particularly in emerging economies where institutional limitations may slow AI adoption. Training programs, knowledge exchanges, and technical assistance can help governments use AI tools more effectively and reduce dependence on external vendors.

Organizational change management also represents a significant policy challenge. Introducing AI into financial operations alters workflows, shifts responsibilities, and requires staff to engage with new analytical tools. Policies should therefore include strategies to manage resistance, communicate reform objectives, and align incentives. Studies have shown that digital transformation succeeds when employees understand the value of new tools, receive adequate training, and participate in reform processes (Gupta and Mason, 2020). Governments should also redesign job descriptions and performance metrics to reflect hybrid roles that combine technological and analytical responsibilities. For donors, funding for change management activities should be integrated into project budgets, recognizing that technology adoption depends as much on organizational culture as on hardware and software.

A further implication concerns the importance of pilot testing and iterative adaptation. Rather than launching large scale AI reforms immediately, governments can begin with targeted pilots in high priority areas such as procurement monitoring or expenditure forecasting. These pilots allow agencies to identify challenges, refine algorithms, and build staff competencies before scaling up. Successful pilots also create demonstration effects that increase confidence in AI adoption across institutions. International donors often support pilot projects as part of broader public financial management reforms, and their involvement can accelerate learning by providing comparative insights from other countries.

Ultimately, effective AI adoption requires coordination among national institutions, sub national governments, and external partners. Fragmentation in public financial management is common, particularly in decentralized systems. AI tools that are implemented without coordination can create inconsistencies in data, oversight, and reporting. Policymakers should therefore establish interagency committees or working groups to oversee AI adoption and ensure that information flows across institutions. Donors can reinforce this coordination by aligning their support across sectors and using common data standards in all digital reform programs.

## CONCLUSION

The integration of artificial intelligence into public financial management represents one of the most significant technological shifts in the field of public sector governance in recent decades. Governments across the world are increasingly recognizing that traditional financial management tools are no longer sufficient to address the growing complexity of fiscal systems, the rapid pace of economic change, and the rising expectations of citizens and international stakeholders. AI offers the potential to transform forecasting, budgeting, procurement oversight, treasury operations, and audit processes by providing more accurate predictions, improving risk detection, and enhancing transparency. However, this potential can only be realized when technological innovation is matched with institutional readiness, strong governance frameworks, and sustained policy commitment.

The analysis presented in this article shows that the benefits of AI in public financial management extend beyond efficiency gains. AI systems can support more credible fiscal planning, strengthen expenditure control, and reduce opportunities for fraud and mismanagement. They can also help governments respond more effectively to external shocks by generating timely and data driven insights. These capabilities are particularly important in environments where public resources are constrained and where decision makers require reliable information to allocate funds and assess risks. At the same time, the introduction of AI raises complex questions about accountability, ethical safeguards, data quality, and institutional capacity. The success of AI adoption therefore depends on an integrated approach that considers both the technological and governance dimensions of reform.

A central finding of this article is that strategic alignment is essential for meaningful adoption of AI based tools. Isolated digital initiatives rarely achieve long term impact. Instead, governments need national strategies that articulate clear objectives, assign responsibilities, and integrate AI across the entire financial management cycle. These strategies should be supported by robust data governance frameworks that ensure interoperability, standardization, and reliability. When these conditions are in place, AI can enhance rather than disrupt existing financial management information systems and oversight mechanisms. Conversely, when data is fragmented or institutional mandates are unclear, AI tools struggle to generate accurate results, and reforms risk producing uneven outcomes across agencies.

Capacity remains another critical determinant. Public financial management has traditionally relied on accountants, auditors, economists, and policy analysts. AI integration requires expanding this skill base to include data scientists, statistical programmers, and specialists in machine learning. Governments must therefore invest in long term training and develop teams that combine technical and financial expertise. This transition poses challenges, particularly in resource constrained countries where recruitment of specialized talent may be limited. Yet without adequate capacity, AI tools risk becoming underutilized, misunderstood, or inconsistently applied.

Ethical and regulatory considerations also play a central role in successful AI adoption. Fiscal decisions directly affect public welfare, and any use of automated tools must be transparent, explainable, and consistent with legal standards. Governments must ensure that AI does not introduce bias into procurement evaluations, expenditure classifications, or risk scoring models. Clear rules are necessary to define how human oversight interacts with automated recommendations and how accountability is assigned when errors occur. These safeguards are essential not only for institutional integrity but also for maintaining public trust in digital financial systems.

International donors have an important complementary role. Many emerging economies rely on external partners for support in strengthening their financial management institutions. Donors can contribute by offering technical assistance, funding capacity building programs, and sharing global best practices related to AI governance. They can also support pilot initiatives that allow governments to test AI applications before scaling up, reducing the risks associated with large investments in new technologies. When donor interventions are aligned with national strategies, they can accelerate reforms and increase coherence across different sectors and institutions.

Despite the significant promise of AI, this article recognizes that challenges remain. Institutional fragmentation, legacy systems, data quality issues, and resistance to change can limit the effectiveness of

digital reforms. In some contexts, fundamental governance reforms may be necessary before AI can be meaningfully applied. In others, AI adoption may proceed in phases, beginning with targeted use cases such as procurement risk monitoring or expenditure forecasting. The lessons from early adopters show that gradual, iterative approaches tend to be more successful than rapid, large scale transformations that overlook institutional realities.

To sum up, the findings of this article underscore that AI is not a substitute for sound public financial management. Instead, it is a tool that can amplify the effectiveness of well designed fiscal institutions. When governments establish strong governance frameworks, invest in capacity, develop coherent strategies, and maintain ethical standards, AI can significantly strengthen fiscal discipline, transparency, and public accountability. The future of public financial management will likely be shaped by the increasing use of data driven systems, and countries that prepare their institutions for this transition will be better positioned to manage fiscal risks and deliver high quality public services.

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