Received: 05 January 2026 | Revised: 24 February 2026 | Accepted: 15 March 2026
DOI: https://doi.org/10.65755/jpa-20264701-130

Public Finance Problems and Use of Artificial Intelligence: Opportunities and Challenges in Pakistan

Saba Asghar Bhutta[1*]

To cite: Bhutta, S. A. (2026). Public finance problems and use of artificial intelligence: Opportunities and challenges in Pakistan. *Journal of Pakistan Administration*, 47(1), 185–205. https://doi.org/10.65755/jpa-20264701-130

ABSTRACT

Pakistan's Public Finance Management (PFM) system faces deep-rooted inefficiencies which include low tax collection, fragmented data systems, and weak transparency. These structural challenges have led to exiguity of fiscal space and eroded public trust in governance. This paper aims to address such structural intrackabilities by examining the potential role of Artificial Intelligence (AI) and using Estonia's digital governance model as a comparative benchmark. The study adopts a qualitative and analytical approach as a methodology. It draws on secondary data, international policy documents, and case evidence. It also employs a SWOT analysis and a comparative case study of Estonia to assess Pakistan's readiness for AI adoption in PFM. The scope covers four core PFM functions encompassing budgeting, taxation, auditing, and transparency. It assesses potential applications of AI such as predictive analytics, anomaly detection, and digital citizen services. The findings indicate that AI could enhance Pakistan's tax-to-GDP ratio by 3% while improving annual fiscal gains up to PKR 900 billion. It can also aid in improving fiscal transparency by reducing fraud-related losses by more than PKR 200 billion. Comparably, implementation costs are estimated at only PKR 700 billion over a decade. Thus, making the projected return on investment over 25 times the cost. However, barriers such as rudimentary ICT infrastructure, siloed governance, and weak regulatory frameworks must be addressed. The paper concludes that AI is not a magic wand rather it is a strategic enabler. AI revolution in Pakistan can be achieved by adopting a phased roadmap. Focus must be kept on building digital infrastructure, trained manpower and creating ethical safeguards. AI tools can catalyze governance modernization in Pakistan and its ramifications transcend beyond efficiency gains. It underscores AI's potential to fortify fiscal justice and reinvigorate the social contract between state and the society.

Keywords:
Public Finance, Artificial Intelligence, Pakistan, Estonia, Fiscal Reform, Digital Governance, Data-Based Decision Making.

1. INTRODUCTION

Pakistan's Public Finance Management (PFM) system has long been marred by systemic challenges. It is suffering from low levels of tax

[1]*Pakistan Audit & Accounts Service*
e-mail: sabahatbhutta1@gmail.com

collection, fragmented and outdated data infrastructure and lack of citizen trust. Budget processes often lack transparency, and mechanisms for holding institutions accountable remain weak. These gaps have aggravated fiscal deficits and eroded public trust (Partnership, 2021; Wani, 2023). Meanwhile, countries around the globe are leveraging Artificial Intelligence (AI) as a catalyst for reform. AI offers real-world applications in revenue forecasting, automated compliance, fraud detection, and improved citizen services (Martinez, 2024; Aldemir & Uysal, 2025). This paper explores how AI can enable Pakistan to address its fiscal inefficiencies by taking inspiration from Estonia's well-documented progress in digital governance.

Estonia's model is built on strong technical foundations. They have an efficient and secure data exchange system, "X-Road" and a universal e-ID framework. These innovations are supported by legal reforms, long-term policy commitments, and sustained investments in digital skills. As a result, Estonia has implemented predictive budgeting, automated tax systems, and transparent fiscal tracking (E-Estonia, 2024; OECD, 2020). By contrast, Pakistan is far behind on this front as evidenced by its rank of 150 on the UN E-Government Development Index. But this gap also provides a clear opportunity. By adopting a multi-pronged strategy focused on data interoperability, capacity-building, and legal reform, Pakistan can lay the groundwork for meaningful change (Iqbal, 2023).

In pursuit of this objective, this paper lays out a practical three-stage roadmap for AI integration in Pakistan's PFM system.

- **Stage One: Foundation** — Develop digital infrastructure, create legal safeguards, and train personnel.
- **Stage Two: Piloting and Integration** — Launch targeted AI-driven initiatives in tax enforcement, budget planning, and audit functions.
- **Stage Three: Scaling and Governance** — Expand successful pilots, embed AI tools into core systems, and establish regulatory oversight to ensure ethical use.

1.2 Statement of Problem

As discussed earlier, the PFM system in Pakistan performs below its requirements. The country's tax-to-GDP ratio is around 8.7% to 9.2% FBR, 2024-25, which is far below the regional average of 15–20%. It is gravely limiting fiscal space for development spending. At the same time, budget execution is inefficient with an estimated 15–20% variance between allocations and actual spending which results in frequent lapses

and misallocations (Finace Division, July-December, FY-2025) public financial data remain scattered across siloed systems in the FBR, CGA (Controller General of Accounts), and provincial finance departments which makes real-time decision-making difficult. According to the Open Budget Survey 2021, Pakistan scored 44 out of 100 in fiscal transparency. It reflects weak public access to financial information and limited accountability mechanisms. In contrast, countries like Estonia have integrated Artificial Intelligence (AI) into their PFM systems. It enables predictive budgeting, automated tax audits, and real-time expenditure monitoring placing it among the top performers in the UN E-Government Development Index (ranked 3rd in 2024). While Pakistan ranks 150th. This points to a policy and capability gap which not only limits efficiency and oversight but also undermines citizen trust in fiscal governance. To tackle this, a strategic investment in AI is imperative. But it needs to be combined with institutional and legal reforms in order to ensure its success in improving PFM model. Hence reducing deficits, increasing transparency and building citizen trust.

2. RESEARCH METHODOLOGY

2.1 Approach

This study adopts a qualitative, analytical approach. It uses secondary data including international publications and policy documents of government of Pakistan, Estonia and International Organizations. For a structured assessment it employs SWOT and a case study of Estonia as the basis of analysis. Key questions addressed: which PFM functions can AI enhance in Pakistan? what impediments exist? and what lessons can be drawn from Estonia's experience?

2.2 Scope of the Study

The paper limits its focus to four nodal areas of PFM: (i) budgeting and planning, (ii) tax administration, (iii) expenditure and auditing, and (iv) transparency and citizen engagement. It assesses how AI tools like machine learning, automation, and chatbots can improve governance output.

2.3 Limitations

The analysis is based on data available as of 2025. It does not account for any prospective technological or policy shifts. The comparison of Estonia is used a reference point for structured analysis but certain contextual divergences need careful consideration. The findings presented in the paper are intended to provide a guiding framework for AI adoption in

Pakistan given that local feasibilities and institutional realities ultimately shape implementation.

3. ANALYSIS

3.1 Situation Analysis (Current Challenges & SWOT)

This section analyzes Pakistan's current PFM situation and its readiness to adopt AI. It is structured as a SWOT analysis of internal strengths and weaknesses, and external opportunities and threats related to AI in public finance. It builds on the challenges outlined in the problem statement, while also identifying any existing advantages Pakistan can leverage.

3.1.1 Strengths (Internal factors supporting AI in PFM):

- **Emerging Political Will and Vision**: Pakistan's government has shown intent to digitize governance through initiatives like *Digital Pakistan* and the *National AI Policy (2023)*. It shows government's will to translate it into sustained action by adopting a national vision for AI in Public Finance. It can catalyze legal, institutional, and budgetary support (Iqbal, 2023).

- **Existing Digital Infrastructure**: Pakistan already possesses Foundational systems like NADRA's CNIC-based digital ID, platforms from the State Bank like RAAST payment system and FBR POS which support digital payments and data analytics. Though underutilized, these assets mean Pakistan is not starting from scratch.

- **Youth and IT Talent**: Pakistan has a domestic talent pool for AI development with a tech-savvy youth bulge and a robust IT sector. Universities produce thousands of CS graduates annually and private sector is creating a diaspora of skilled professionals presenting further opportunities for innovation and capacity building.

- **Small-Scale Innovations**: Public bodies like the FBR and AGP have piloted AI tools like PRAL, Qlik sense, IFMIS, E-PADS for digital procurements. Some provinces use e-procurement systems with anomaly detection features. These are small steps in the right direction though much needs to be done.

- **International Partnerships**: International institutions World Bank, ADB, UNDP, and others provide ongoing assistance to Pakistan in the form of technical expertise, funding, and global insights. These

partnerships can be mobilized to scale AI applications in budgeting, auditing, and financial transparency.

3.1.2 Weaknesses (Internal factors hindering AI adoption):

- **Inadequate ICT Infrastructure:** Pakistan's outdated IT infrastructure is major hindrance in deploying IT/AI solutions. Many government offices, especially at provincial and district levels, lack updated hardware, software, and connectivity. Old computers, paper-based records, and limited broadband access make it impossible to create a robust AI infrastructure.

- **Fragmented Data Systems:** An AI based PFM system requires a big data bank. While in Pakistan financial data are scattered across fragmented, non-interoperable systems (e.g., FBR, provincial treasuries, planning departments). Without centralized, clean, and accessible datasets, AI models cannot function effectively.

- **Human Resource Gaps:** In Pakistan's public sector there is a shortage of skilled professionals in AI, data science, and data analytics. Most staff are trained in conventional finance or administration, not digital tools.

- **Absence of a Coherent AI Strategy:** Although Pakistan has drafted a National AI Policy, no actionable roadmap has yet been developed for its integration in PFM. Ministries and departments remain unclear about their roles and there is no central entity to coordinate the efforts.

- **Weak Regulatory and Legal Framework**: Pakistan lacks robust data-sharing protocols, cybersecurity standards, and AI-specific legal provisions. Procurement processes are paper-based and protracted. Digital documents are not universally accorded as legal equivalents to paper. These regulatory weaknesses create friction and delay for AI adoption in governance. Although an Electronic Transaction Ordinance has been promulgated but its adoption in a practical sense remains yet to be seen ETO, 2024.

3.1.3 Opportunities (External factors that Pakistan can exploit):

- **Efficiency and Revenue Gains:** AI can automate routine tasks like invoice matching, payroll processing, and report generation thus boosting efficiency and allowing staff to focus on analysis (Forum, 2025).AI analytics can identify non-compliant taxpayers by cross-

referencing lifestyle and income data. The Islamabad Policy Research Institute estimates that such tools could potentially double Pakistan's tax-to-GDP ratio in five years (IPRI, 2025).

- **Transparency and Accountability:** AI can enhance fiscal transparency in Pakistan through real-time dashboards and anomaly detection. Integrated financial data can enable lawmakers and the public in increasing oversight and reducing corruption. Tools for fraud detection and expenditure monitoring could improve Pakistan's Open Budget Index ranking (Martinez, 2024).

- **Leapfrogging Through Global Tech:** Pakistan can reduce development time and costs by adopting globally proven AI systems. Assistance of international partners like the World Bank and UNDP can be availed for AI pilots. Collaborations with institutions such as the IMF or Estonia's e-Governance Academy can fast-track AI adoption in PFM (Martinez, 2024).

- **Citizen Engagement and Service Delivery:** AI-powered chatbots and analytics tools can simplify public access to budget and improve citizen engagement. Public services, such as targeted subsidies and faster tax refunds through AI enabled grievance redressals can enhance public satisfaction and accountability.

- **Promoting a Data-Driven Culture**: AI encourages data-based decision-making which helps in predicting budget shortfalls, monitor performance, and allocate resources more effectively. Over time, this fosters a culture of evidence-based governance and improves overall public sector performance.

3.1.4 Threats (External risks and challenges):

- **Ethical and Social Risks**: Concerns about AI misuse often arise if models are trained on skewed data, leading to unfair budget allocations or tax profiling. Without proper ethical safeguards and human oversight, AI decisions can sometimes trigger public backlash and violate privacy. This can undermine trust in government initiatives.

- **Cybersecurity Threats:** Digitized PFM systems increase exposure to cyberattacks. Sensitive data can be targeted by hackers raising concerns about safety and manipulation of data. Pakistan's current cybersecurity capacity is limited. This underscores importance of a

dedicated Cyber Emergency Response Team (CERT) for ensuring safeguards.

- **Implementation Failures:** Overambitious or poorly planned AI projects may be prone to failure. Lack of data readiness, staff training, or unrealistic goals can derail initiatives and waste scarce resources. To circumvent "AI hype" disillusionment, incremental pilots with clear outcomes are crucial to building momentum.

- **Legal and Compliance Gaps:** In Pakistan financial and audit laws are outdated and they do not recognize AI-generated insights. This also limits AI adoptability and accountability for AI errors. Moreover, non-compliance with global standards (e.g., GDPR, IMF) in handling foreign data could invite legal and diplomatic issues in the absence of a clear AI legal framework.

- **Public Resistance and Change Management**: Apprehensions surrounding surveillance, job displacement, and AI-related errors may engender resistance from worker unions, the media, and opposition groups. Inadequate communication and limited inclusivity can further exacerbate public backlash. The successful adoption of AI therefore necessitates transparency, workforce retraining, and sustained stakeholder engagement to cultivate public trust and confidence.

This SWOT analysis underscores that although Pakistan faces substantial weaknesses in its AI readiness, the opportunities afforded by AI in public finance are equally substantial in terms of their transformative potential and prospective gains.

3.2 Comparative Case: Estonia's Digital PFM Model

Estonia offers a compelling case study of how a government can successfully digitize its public finance management and incorporate AI tools to enhance governance. This section provides an overview of Estonia's digital government journey, specifically focusing on elements relevant to PFM and AI, and draws comparative insights for Pakistan.

3.2.1 Background: Estonia's Digital Transformation

This small country with just over 1.3 million population, realized early on that digital innovation could help overcome the limitations of size and resources. The pivotal moment in their digital transformation journey came in 1997 with the launch of the "Tiger Leap" (Tiigrihüpe) initiative. It was a national effort to integrate IT education and digital access across

schools and institutions. This initiative laid the groundwork for what would become the celebrated e-Estonia framework.

Table 1
Key Indicators of Digital PFM Capability – Estonia vs. Pakistan

Dimension	Estonia (Leader in e-Governance)	Pakistan (Current State)
Digital Infrastructure	Advanced nationwide ICT infrastructure with integrated platforms (e-ID system, X-Road data exchange network) enabling interoperable services. Nearly 100% internet access and high digital literacy.	Underdeveloped infrastructure; siloed and outdated IT systems. Limited connectivity in many areas; ~36% internet penetration and gaps in basic computer access in government offices.
AI Applications in PFM	Comprehensive use of digital solutions in PFM including predictive budget analytics, AI-assisted tax filings, automated fraud detection in expenditures. Over 95% of taxes are filed online. AI chatbots and assistants have been piloted for public services.	Very limited AI use with a few pilot projects. Tax e-filing exists but used by a minority. Budgeting and auditing are still largely manual. AI initiatives are mostly in concept phase or small-scale trials.
Legal & Regulatory Framework	Strong legal frameworks supporting digital governance including Digital Signature Act (2000) giving legal status to e-transactions, dedicated AI strategy (KRATT, 2019) with clear guidelines and accountability measures. Strict data protection laws aligned with EU standards.	Weak or absent regulations for AI. Draft National AI Policy (2023) has not yet been implemented. No specific laws on algorithmic accountability. Data protection law is still in draft. Legal recognition of digital records is limited.
Data Governance	Centralized and high-quality data systems. "Once-only" principle is used meaning data is shared across agencies via X-Road, ensuring interoperability. Real-time data updates and unified databases (e.g. national population register) support AI analysis.	Fragmented, siloed data with inconsistent standards. No centralized financial data exchange. Each department holds its own records. Data quality issues are prevalent due to manual processes. Little data sharing across agencies hinders data analytics.

Dimension	Estonia (Leader in e-Governance)	Pakistan (Current State)
Human Capital (AI Skills)	High levels of digital literacy. Government officials and workforce largely comfortable with e-services. Specialized units (e.g. Government CIO office, AI Task Force) drive capacity-building. Estonia's education system emphasizes on IT skills, producing talent that often enters public service.	Low AI and data expertise in government. Few officials are trained in data science or AI. Reliance on external consultants for technical projects. Limited training programs in civil service for advanced IT. Brain-drain of tech talent to private sector or abroad.
Public Trust & Engagement	High public trust in digital services due to consistent transparency and convenience. Citizens actively use e-government portals (e.g. e-Tax, e-voting) and have confidence in data security. Digital participation is encouraged and user experience is prioritized. Estonia ranks at the top of UN e-gov and open data indices.	Low trust in government digital initiatives. Past failures and cybersecurity incidents make citizens cautious. Limited public awareness of digital services. Citizens rarely interact with budget or tax systems online, partly due to usability and trust issues.

Source: Above table is compiled by author from various sources including UN EGDI reports, European Commission (2016) project stories, Estonian Governments' National AI Strategies and OECD Digital Government Reviews.

One of the cornerstones of this transformation was the development of X-Road in 2001. It is a secure, decentralized data exchange platform that allows various public databases to interact in real time. It was more than a technological upgrade; it was a rethinking of governance itself. Estonia backed its digital journey with over €200 million in public investment with the help of European Union and strategic partnerships with countries like Finland.

What truly fueled this success, however, was consistency in political vision. Across successive governments, the digital agenda remained a national priority. By 2020, Estonia had achieved near-universal internet access. Most public services had already been digitized. Citizens could file taxes, register businesses, and access government services online with ease.

3.2.2 AI Applications in Estonia's Public Finance Management

After firmly placing its digital backbone, Estonia gradually introduced artificial intelligence (AI) to optimize management of public money. Estonia's innovations are not just theoretical. These are embedded in real-world tools that now form part of their everyday governance. Here's a

closer look at how AI has shaped key areas of Estonia's public financial management and how Pakistan might adapt similar strategies:

a. Tax Administration

Filing taxes in Estonia is now a matter of minutes. Thanks to the e-Tax system, most forms are auto-filled using data already linked from employers, banks, and registries. The government uses rule-based algorithms to catch discrepancies. Advanced tools are being tested to detect sophisticated fraud (like VAT carousel schemes). The KrattAI initiative is also creating chatbots to guide taxpayers through the system (KRATT, 2019).

What Pakistan can take away: The Federal Board of Revenue (FBR) still relies heavily on manual enforcement and siloed data. It can integrate CNIC, banking, and tax data into an AI-supported ecosystem to reduce human discretion, improve risk profiling, and even deploy chatbots for taxpayer support.

b. Budgeting and Expenditure

In Estonia, AI is helping in curating the whole budget ecosystem. The Ministry of Finance applies machine learning to forecast spending and revenue under different scenarios. AI is also used to flag unusual patterns in public procurement and to remedy them.

For Pakistan: Pakistan still follows traditional budgeting system which lacks efficiency. By using Predictive tools, it can bring greater foresight to the process. Moreover, procurement systems in Pakistan could benefit from AI-driven anomaly detection to support auditors and watchdogs.

c. Financial Transparency and Citizen Services

Estonia has made public finance data open and interactive for public. Citizens can explore real-time dashboards showing where money is going. AI-powered chatbots answer everyday queries, from budget allocations to project updates.

For Pakistan: Citizen engagement with the budget remains very low in Pakistan. The first step in improving public participation is by making the data accurate and user-friendly. Introduction of chatbots can encourage citizens to take a more active role in holding institutions accountable.

4. FINDINGS (SUBSTANTIATED BY ECONOMIC PROJECTIONS)

This section builds on the lessons from the SWOT analysis and the comparative insights from Estonia's success with AI-driven financial governance. It explores the tangible opportunities that Artificial Intelligence presents for transforming Pakistan's Public Financial Management. Furthermore, it presents realistic scenarios, quantitative projections, and international benchmarks to illustrate how AI can improve revenue mobilization, budgetary efficiency, and fraud detection. While also outlining the cost and return profile of implementing such reforms. These insights form the empirical basis for recommending AI adoption strategies tailored to Pakistan's unique fiscal and administrative environment.

4.1 Opportunities: What AI Can Do for Pakistan's PFM

4.1.1 Boosting Revenue Collection

One of the most pressing challenges in Pakistan is tax collection with current tax-to-GDP ratio hovering around 9% FBR, (2024-25)far below the regional average. However, this can be improved with AI-powered tools. By employing risk-based audit engines, integrated databases linking NADRA, FBR, and banking systems, and smart e-filing platforms.

4.1.2 Projections show:

- AI could help push the tax-to-GDP ratio to *12–14%* within five years if implemented effectively
- With a projected GDP of PKR 85 trillion (2024–25), a 3% increase could translate into *PKR 2.55 trillion* in additional revenue annually.

4.1.3 Why it's realistic:

- The IPRI projects that AI could double the detection rate of high-risk taxpayers (IPRI, 2025).
- India's AI-enabled audit systems reported a 40% increase in fraud detection in their first year.

5. Making Budgeting Smarter and More Efficient

Budgeting in Pakistan is still largely reactive. Smart Budgeting techniques with AI-based forecasting models, procurement monitoring, and budget reallocation tools can significantly enhance the process efficiency.

5.1 Projections suggest:

- Currently, 15–20% of the national budget is either misallocated or underutilized.
- AI can reduce this variance by *30–40%* over five years.

5.2 Estimated fiscal gains:

- Total budget: PKR 13 trillion
- A modest 5–7% improvement can ensure annual savings between *PKR 650–910 billion*.

5.3 Case in point: Estonia saved around 2% of its budget by using anomaly detection tools in procurement (OECD, 2020).

6. FIGHTING FRAUD AND LEAKAGES

Pakistan faces chronic problems of Fraud, misreporting, and leakages in public spending. AI can be applied to counter these by identifying duplicate payments, monitor contracts, and flag suspicious subsidy claims.

6.1 Estimated scope:

- According to the Global Integrity Index, 4–6% of public funds are lost annually to corruption.
- AI tools can reduce this loss by *30–50%.*

6.2 That's a savings potential of:

- PKR 520 billion (4% of the budget)
- With AI cutting this by 40%**,** potential savings reach PKR *208 billion* per year.

6.3 The Cost of Getting There: AI Implementation Investment

Of course, a transformation of this scale comes with a price tag. Implementing AI in PFM will require strategic investments over a 10-year horizon. The break-down is as follows:

- **Phase I (Years 1–2):** Laying the foundation through digital infrastructure upgrades, legal reforms, and institutional training. Estimated cost: PKR 100–120 billion.
- **Phase II (Years 3–5):** Launching pilot projects, adopting secure cloud platforms, and establishing an independent AI Ethics Council. Estimated cost: PKR 150–200 billion.
- **Phase III (Years 6–10):** Scaling successful AI solutions across government departments. Estimated cost: PKR 300–400 billion.

➢ **Total projected investment:** ~PKR 700 billion over ten years.

Table 1
Potential: Return on Investment (ROI) Over 10 Years

Category	Conservative Estimate (PKR)
Increased Revenue	12 trillion
Budget Efficiency Gains	5.5 trillion
Reduced Fraud/Leakage	2 trillion
Total Gains	~19.5 trillion
Total Cost	~0.7 trillion
Net Benefit	~18.8 trillion

6.4 ROI: Projected to yield over 25x return in 10 years

Compared to the projected returns of over PKR 18.8 trillion in fiscal gains the cost of PKR 0.7 trillion is modest. The return on investment (ROI) is potentially over 25 times. It is not just feasible it is financially strategic. These quantified benefits underscore the necessity of a deliberate a phased investment coupled with institutional readiness.

The next section lays out a conclusive framework based on a phased action plan to harness the potential of AI in modernizing the PFM ecosystem in Pakistan.

7. CONCLUSION

Artificial Intelligence offers a compelling avenue for Pakistan to reshape its Public Financial Management. It presents a novel opportunity for transformation not merely in functional terms but in renewed public perception. By calibrating the right strategies, it can support robust revenue collection, smarter allocation of public funds, and greater transparency in government operations. However, this dream can only become a reality if it is matched by strong institutions, updated legal frameworks, and a retrained workforce. Estonia's digital progress can serve as a valuable example in this area. It demonstrates that meaningful reform does not require size or affluence rather it requires strategic clarity and sustained commitment.

Pakistan must lay the groundwork with integrated systems, reliable datasets, skilled personnel and enabling legislation. A phased and prioritized approach may prove more efficacious. Initial deployment in tax compliance, budgeting and audit functions could generate early institutional successes and cultivate administrative confidence.

At the same time, expectations must remain grounded. AI is an enabling instrument, not a panacea. Deficient implementation or inadequate oversight could exacerbate existing inefficiencies and governance deficits. Therefore, robust safeguards are necessary. These include prudent regulatory mechanisms and ethical governance frameworks. An autonomous oversight structure such as a National AI Ethics Council must ensure responsible and equitable deployment of AI tools.

Public trust is equally central to this transformation. When citizens observe tangible improvements in service, the confidence in state institutions is reinforced. Such confidence, in turn, strengthens the social contract between the state and society. Pakistan presently stands at a critical inflection point. The strategic pathways are increasingly evident, and the technological instruments are within reach. What remains essential is sustained political resolve, institutional adaptability, and a long-term reform orientation. With such commitment, AI can emerge as a cornerstone of a more equitable, transparent, and effective public finance system in Pakistan.

7.1 Recommendations

7.1.1 Develop a National AI for PFM Strategy

- Draft and adopt a sector-specific strategy outlining AI applications in taxation, budgeting, auditing, and treasury.
- Form an inter-agency AI in PFM Task Force (led by the Ministry of Finance) to coordinate implementation.
- Include clear timelines: short-term pilots (1–2 years), medium-term adoption (3–5 years), long-term scale-up (5–10 years).
- Embed ethical principles (transparency, fairness, accountability) and legal authority in the strategy.
- Institutionalize oversight by appointing a Chief Information Officer (CIO) in the Finance Ministry.

7.1.2 Upgrade Digital Infrastructure and Enable Data Interoperability

- Allocate targeted budgets (including donor support) to upgrade IT equipment and internet across all public finance offices.
- Build a Government Financial Data Exchange platform to connect key systems (FBR, NADRA, MoF, CGA) via APIs.
- Adopt cloud-based systems with security protocols for scalable computing power.

- Ensure last-mile digital access for remote offices and install backup power solutions where needed to make sure all tiers of government are interconnected.

7.1.3 Strengthen Data Governance and Quality

- Create a central Data Management Unit to clean, standardize, and match records using CNIC and business IDs.
- Enact a Government Data Quality Act mandating data audits, reporting standards, and metadata documentation.
- Update laws and MoUs to allow secure inter-agency data sharing for public interest analysis.
- Launch an Open Budget Data Portal publishing financial data in user-friendly, machine-readable formats.

7.1.4 Build Institutional and Human Capacity

- Launch AI literacy programs for finance officers through short courses with universities like LUMS, NUST, IBA.
- Establish Data Analytics Units in MoF (Ministry of Finance), FBR, and Auditor General's office with trained AI staff.
- Introduce an AI Fellowship Program for tech graduates to work in public departments on real projects.
- Conduct leadership workshops for senior officials on AI strategy and ethical governance.
- Offer scholarships for public servants to pursue degrees in AI/data science with service bonds.

7.1.5 Implement Targeted AI Pilot Projects

- **FBR Tax Compliance AI**: Use machine learning to identify high-risk taxpayers for audit (pilot in Lahore LTU).
- **MoF Budget Forecasting Tool**: Predict fiscal outcomes using macroeconomic and in-year spending data.
- **Expenditure Anomaly Detection**: Use algorithms to monitor and flag irregular spending patterns.
- **Finance Chatbot**: Allow citizens to ask budget questions (e.g., allocations, spending) via a simple AI interface.
- Evaluate each pilot with KPIs (e.g., tax gains, detection accuracy, user satisfaction) before scaling.

7.1.6 Establish Ethical, Legal, and Regulatory Safeguards

- Issue official AI ethics guidelines for public sector, based on OECD/UN standards.
- Set up an AI Ethics Council with members from government, technical, legal, and civil society sectors for buy-in.
- Amend existing laws to recognize AI outputs, define the extent of human oversight, and clarify accountability mechanisms.
- Mandate periodic independent audits of all major government AI tools for ensuring algorithmic transparency.
- Introduce Personal Data Protection Bill with safeguards for public-sector data use.

7.1.7 Foster Public-Private and Global Partnerships to access funding for phased targets

- Create an AI Innovation Fund to support local startups and researchers.
- Host GovTech hackathons in collaboration with universities and research institutes.
- Engage international Partners like Estonia's e-Governance Academy, the World Bank, and the IMF for technical assistance.
- Inculcate cooperation on AI-for-governance in bilateral relations with development partners (e.g., EU, Gulf, China).
- Seek international donors for AI adoption projects in tax, budget, and audit reforms.

7.1.8 Ensure Inclusiveness and Public Trust

- Hold consultations with all key stakeholders including civil society, politicians, labour unions and business associations before AI rollouts.
- Launch public education campaigns explaining AI reforms and their benefits in plain language.
- Emphasize that AI is a support tool and not a replacement. Provide reskilling plans for staff affected by automation to allay their unemployment fears.
- Ensure that services remain accessible in areas with no or low internet connectivity. Content must also be available in local languages and accessible for users with disabilities.
- Establish feedback and redress mechanism to allow users to challenge AI decisions and report issues easily.

7.2 Action Plan

In order to make meaningful progress, Pakistan must approach these recommendations as part of a cohesive strategy rather than isolated interventions. For example, the success of pilot initiatives depends heavily on whether foundational efforts such as improving data quality and enhancing institutional capacity are underway. Implementing one without the other would likely result in disappointment. Hence, a structured and phased plan is needed that connects these elements logically across short, medium, and long-term goals. This integrated approach will ensure that each step reinforces the next. It lays the groundwork for a gradual but sustainable transformation of public financial management through AI.

Phase	Time Period	Key Actions	Responsible Agency
Short-Term	**2025–2027**	Approve National AI for PFM Strategy	Ministry of Finance (MoF), MoITT
		Form AI Task Force and appoint Chief Information Officer (CIO) in MoF	MoF, Establishment Division
		Upgrade IT infrastructure in finance departments	MoF, NITB, Provincial IT Boards
		Build Financial Data Exchange system (API integration: NADRA, FBR, MoF, CGA)	NITB, FBR, NADRA, CGA
		Enact Personal Data Protection Law	Ministry of Law & Justice, MoITT
		Launch AI training for finance officers	NSPP, LUMS, NUST, IBA
		Start pilot projects: AI audit tool (FBR), Budget forecasting (MoF)	FBR, MoF
		Launch Open Budget Data Portal	MoF, Auditor General of Pakistan (AGP)
Medium-	**2028–2030**	Expand AI pilots to provinces and key departments	MoF, FBR, AGP

		Establish AI Ethics Council and issue public sector AI guidelines	MoITT, Cabinet Division
		Amend laws to recognize AI-generated outputs in audits and budgeting	Ministry of Law, MoF
		Create Analytics Units in MoF, FBR, AGP	MoF, FBR, AGP
		Launch AI Fellowship Program for tech graduates	HEC, MoF
		Conduct GovTech Hackathons and public awareness campaigns	NITB, Planning Commission
		Deploy secure, cloud-based computing for PFM	MoITT, PTCL
Long-Term	**2031–2035**	Full integration of AI in core PFM areas: tax, budget, audit, treasury	MoF, CGA, FBR, AGP
		Establish permanent AI Directorate for Public Sector Governance	Cabinet Division, MoITT
		Form international partnerships with Estonia, IMF, WB for AI benchmarking	EAD, MoF, Foreign Affairs
		Rollout nationwide AI finance chatbots in Urdu and regional languages	MoF, Ministry of Information
		Audit AI tools and monitor ROI, transparency gains	AGP, Public Accounts Committee
		Ensure all financial services remain accessible offline and for people with disabilities	MoF, NADRA, Social Welfare Departments

Expecting that Pakistan will integrate AI into its PFM ecosystem overnight is not realistic. It will take time, coordination, and flexibility. But with a shared vision, thoughtful planning, and cooperation across sectors, the country can set foot on the path to improved governance. The

ideas shared here offer a place to start. What comes next depends on leadership who is willing to act, and institutions ready to work cohesively to make it a reality.

Declaration Of Originality and Ethical Considerations

I, **Saba Asghar Bhutta**, hereby declare that this paper titled *"Public Finance Problems and Use of Artificial Intelligence: Opportunities and Challenges in Pakistan"* is my original work. It has not been published previously. Proper citation and acknowledgment have been provided for all sources consulted. The study fully complies with the ethical standards of academic research, including integrity, transparency, and avoidance of plagiarism.

8. References

Aldemir, & Uysal. (2025). Artificial Intelligence for Financial Accountability and Governance in the Public Sector: Strategic Opportunities and Challenges. MDPI. https://doi.org/10.3390/admsci15020058

E-Estonia. (2024). Estonia is at the top of the United Nations e-government ranking. Retrieved from E-Estonia: https://e-estonia.com/estonia-is-at-the-top-of-the-un-e-government-ranking/

ETO. (2024). Electronics Transaction Ordinance. Government of Pakistan.

FBR. (2024-25). Evidence based revenue forecasting. Islamabad: FBR.

Finace Division, G. o. (July-December, FY-2025). State of Pakistan's Economy, Half Yearly Report. Islamabad: Finance Division.

Forum, G. G. (2025). A quiet revolution: driving efficiency in government using 'pragmatic AI'. Retrieved from Global Government Forum: https://www.globalgovernmentforum.com/a-quiet-revolution-driving-efficiency-in-government-using-pragmatic-ai/

IPRI. (2025). Use of AI in FBR to Increase Revenue. Islamabad Policy Research Institute.

Iqbal, S. (2023). Pakistan's Draft National AI Policy: fostering responsible adoption and economic transformation. Retrieved from International Bar Association: https://www.ibanet.org/Pakistan-draft-national-ai-policy-fostering-responsible-adoption

KRATT. (2019). estonia's national artificial intellgence strategy 2019-21. KRATT Estonian Artificial Intelligence Deployment.

Martinez. (2024). Unleashing the Power of AI in Public Finance. Retrieved from IMF PFM Blog: https://blog-pfm.imf.org/en/pfmblog/2024/06/unleashing-the-power-of-ai-in-public-finance

OECD. (2020). The OECD Digital Government Policy Framework six dimensions of a digital government. Paris: OECD Public Governance Policy Papers No. 02.

Partnership, I. B. (2021). Pakistan Open Budget Survey. Retrieved from International Budget Partnership: https://internationalbudget.org/open-budget-survey/country-results/2021/pakistan

Wani, S. R. (2023). Why does Pakistan tax so little? Retrieved from The IGC: https://www.theigc.org/blogs/taxing-effectively/why-does-pakistan-tax-so-little?