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Digital Transformation in Public Financial Management: A Report on Governance, Integrity, and Technology

Digital transformation in Public Financial Management (PFM) has evolved from a technological upgrade to a structural necessity for modern governance. This paper examines the transition toward digital PFM, highlighting its role in addressing a global integrity crisis characterised by annual losses of US \$4.5 trillion due to inefficient use of public funds. As of 2025, digital

maturity was defined by meaningful participation and integrated platforms, as evidenced by the World Bank's GovTech Maturity Index (GTMI), which reached a global average of 0.589.

The transition faces complex challenges, categorised into legal, social, and ethical perspectives. Legally, 'blackbox' algorithms threaten judicial review, necessitating a 'duty of candour' from the state. Socially, a digital divide affecting 2.6 billion people risks exacerbating exclusion, while ethically, the rise of 'dark patterns' undermines public trust. Global case studies, such as Estonia's KSI (Keyless Signature Infrastructure), Blockchain, and India's Unified Payments Interface (UPI), demonstrate successful implementations, while failures in Moldova and Toronto underscore the risks of weak oversight and privatized public policy.

The article proposes a '3PT' framework i.e., Policy, Process, People, and Technology, to guide future reforms. Key recommendations include re-engineering processes before automation, adopting phased rollouts, and transitioning from reactive monitoring to AI-driven predictive stewardship. Finally, the report emphasises the evolving role of accounting professionals as Digital Integrity Officers, essential for maintaining the 'auditability' of complex digital ledgers and securing the state's fiscal engine room.

Public Financial Management (PFM)

Public Financial Management (PFM) serves as the engine room of the modern state. It represents the essential operational framework for the collection, allocation, and accountability of public resources, thereby sustaining the social contract between the state and its citizenry (Osuntoyinbo, T. M., 2026). When PFM systems fail, the very foundation of governance erodes.

This article seeks to address certain basic issues with regard to the urgent need of transforming the PFM using information technology. Digital transformation of PFM is the need of the hour. This article looks at the digitisation and digital transformation aspects in PFM, rather than PFM itself.

Imperative for Digitisation

The global community currently faces an integrity crisis of staggering proportions. International Monetary Fund (IMF) models estimate global

losses of approximately US \$4.5 trillion annually i.e., nearly 5% of the world GDP, due to inefficient use of public funds within public financial systems. About US \$1.7 trillion of this loss occurs specifically at the budgetary central government level (IMF, 2023). Traditional paper-based systems are structurally incapable of mitigating these risks as they fail to provide immutable, verifiable audit trails required for a professional and democratic oversight. This vulnerability allows for unauthorized

adjustments and hidden transactions that manual auditing cannot detect in real-time (Osuntoyinbo, T. M., 2026). Consequently, the transition to digital PFM is no longer an optional upgrade; it is a structural requirement to ensure fiscal stability and public trust.

The Landscape of Government Digital Maturity in 2025

As of 2025, digital maturity has evolved beyond simple internet access to focus on meaningful participation - the ability of a state to deliver essential services through integrated, sophisticated platforms. “Governments must work with fintechs, telcos, content providers, and community leaders to scale up infrastructure, access, and support”

(Pateriya, S. (2025). The World Bank’s GovTech Maturity Index (GTMI) 2025 provides the benchmark for this transition, evaluating 198 economies across four primary pillars: core government systems, public service delivery, digital citizen engagement, and GovTech enablers (World Bank, 2025).

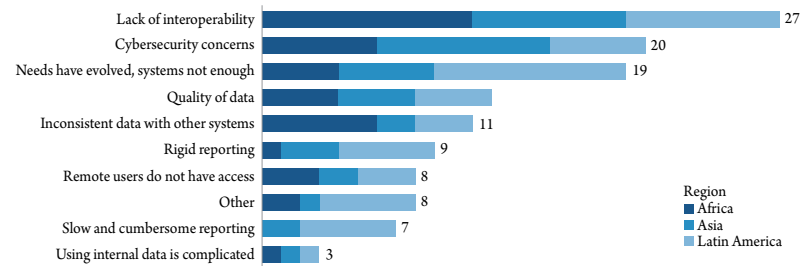
The 2025 GTMI data reveals a global average increase to 0.589, up from 0.552 in 2022. However, this progress is marked by a widening gap between Group A (high maturity) leaders and Group D (low maturity) economies (World Bank, 2025). While advanced states are integrating frontier sub-indicators, specifically AI Ethics, Green Tech policies, and Digital Identity, developing nations often struggle with legacy system inertia.

Table 1: Digital Maturity Indicators - 2025

Indicator	Strategic Focus	Global Status 2025
AI Ethics & Governance	Ethical utilization of automated decision-making and bias mitigation.	70% of government bodies are currently piloting or planning AI use.
Green Tech Policies	Integration of environmental sustainability into digital architecture.	New sub-indicator; high correlation with Group A maturity.
Digital Identity (ID)	Seamless authentication using National Digital IDs for public services.	Fundamental to the “whole-of-government” approach in leading states.
Cloud-Based PFM	Secure, interoperable cloud enclaves replacing fragmented legacy servers.	Essential for real-time macro-fiscal monitoring and data integrity.

Source: Synthesized from World Bank GTMI 2025 and IMF Digital Solutions Guidelines (Rivero del Paso et al., 2023).

Figure 1: Main Issues or Challenges Faced by PFM IT Systems in 30 Countries, by Region



Source: Digital Solutions Guidelines for Public Financial Management. IMF Technical Notes and Manuals 2023/007

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Key Issues in Digital Transformation

Digital transformation, though a technical task, is invariably hindered by administrative and capacity gaps. Figure 1 highlights the core technical and non-technical challenges that are faced during the digitalisation process. Furthermore, the severity of the issues remains at a similar level throughout the regions. Technology isn’t meant to be an unbiased instrument; it actively engages with organizational law and social fairness. Executing digital PFM without dealing with the hurdles can lead to risks related to digitizing ineffectuality or aggravating exclusion.

It is helpful to resolve these issues not just from a technical standpoint but also from a governance approach. Therefore, the listed below considerations must be taken into account:

Legal/Administrative Perspective

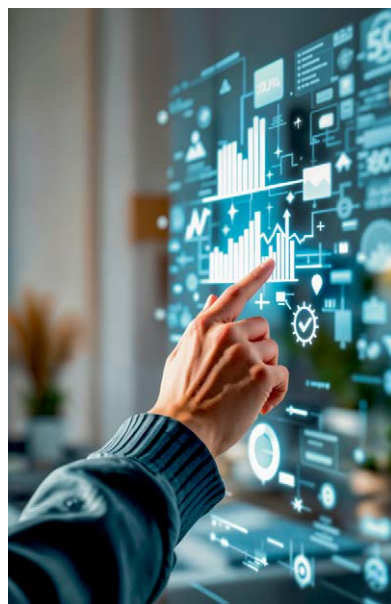
As automation becomes rapidly integrated into government decision-making, ‘blackbox’ algorithms pose an immediate difficulty to legal obligations. Lord Sales (2025) highlights an intrinsic strain; judicial review depends on comprehending why a conclusion was reached – especially if it was drawn for proper purposes. When AI produces patterns that are indecipherable to humans, it poses a threat to impairment of judgment, where executives

unthinkingly make use of algorithmic prompts, significantly hindering their judicial discretion.

In order to alleviate this, following Lord Sales' emphasis upon the 'duty of candour' could prove to be helpful. This duty is applicable to the preliminary level of technology execution, necessitating administrative authorities to elucidate the system's logic and possibility of prejudice before legal proceedings. Additionally, if a system is innately impenetrable, the weight of clarification must pivot to the State to establish the system's rightfulness (Sales, 2025). This addresses crucial design specifications.

Social Perspective

The technological gap continues to be a notable hurdle to engagement. Nearly 2.6 billion individuals continue to be offline (ITU, 2023). Beyond connection, a lack of the required skills, (which has constantly increased with the integration of AI) and a gap in the availability of economical devices bring about new types of alienation. Susceptible individuals often make use of obsolete devices that are no



“India utilizes its biometric ID system to authenticate Direct Benefit Transfers (DBT), which has reduced ghost beneficiaries and saved the government over US \$1 billion in LPG subsidies alone.”

longer compatible with internet banking or subsidy applications. Narrowing this gap demands moving past conventional infrastructure to the collaboration of FinTech and Telecom, employing Mobile Network Operators (MNOs) and Mobile Virtual Network Operators (MVNOs) to capitalize on abundant public data e.g., telecom data for credit rating for the financially underserved.

Ethical Perspective

Within the Indian setting, the rise of dark patterns¹ such as manoeuvred UI/UX designs, erode trust. A study of 53 widely-used Indian applications disclosed that 52 amongst them made use of at least one delusive tactic such as interface interference or drip pricing² (Law Web, 2025). Such methods result in users getting involved in unexpected financial obligations, endangering the probity of electronic payments.

These viewpoints further give rise to difficulties encountered in the digital transformation. Any structural approach should help tackle these challenges.

Case Studies: Triumphs and Challenges in Digital Transformation

There have been numerous triumphs and challenges from across the world with regard to digital transformation.

A few cases are highlighted here to showcase and discuss the approaches that are required in this regard.

Global Cases: Triumphs and Challenges

Triumphs

- **Estonia:** This case is considered the benchmark for data integrity. Estonia utilizes KSI Blockchain alongside its X-Road infrastructure. KSI (Keyless Signature Infrastructure) uses 2048-bit public key encryption to create a tamper-proof, distributed validation structure. This ensures that no government record, from tax filings to health data, can be retroactively manipulated (Access Now, 2019).
- **Singapore:** Through its GovTech initiative, Singapore employs a whole-of-government (WOG) approach to AI. Singapore uses real-time anomaly detection to identify procurement irregularities and compliance breaches, maintaining world-leading integrity scores by building in-house expertise (Tech. Gov.sg, 2025).

Challenges

- **Moldova:** The 2014 billion-dollar bank fraud, where more than an eighth (12%) of GDP was siphoned through shell companies and fraudulent lending, exposed the catastrophic risks of weak regulatory capacity, poor governance, and lack of digital oversight (Arnold, 2025).
- **Toronto's Smart City Project (Sidewalk Labs):** This massive digital transformation plan was shelved due to profound concerns regarding public values. Issues included a lack of trust, concerns over privacy, and the questionable political legitimacy of a private tech company (a Google sister company) being so deeply involved in public policy and data collection (Eom, S.-J. and Lee, J., 2022).

¹ Dark patterns are user interfaces that have been carefully crafted to trick users into doing things they originally did not intend or want to do.

² Drip pricing is a deceptive marketing technique where only part of a product's price is advertised upfront, with additional mandatory fees or charges revealed incrementally during the checkout process

India Cases: Triumphs and Challenges

Triumphs

- **UPI:** The Unified Payments Interface (UPI) is a global leader, processing over 15 billion transactions monthly as of late 2024 (Cornelli et al., 2024). This has revolutionized social payment transparency.
- **GIS Mapping for Property Tax in Kanpur:** Authorities in the Indian city of Kanpur utilized Geographic Information System (GIS) mapping to update fiscal cadastres and monitor tax evasion. By using geocoding to improve the mapping and identification of previously unrecorded properties, the municipal government was able to more than triple its annual revenue from house taxes compared to the traditional collection system (Access Partnership 2018).
- **Aadhaar-Linked Payments:** India utilizes its biometric ID system to authenticate Direct Benefit Transfers (DBT), which has reduced ghost beneficiaries and saved the government over US \$1 billion in LPG subsidies alone (Access Partnerships, 2018).



Challenges

- **Systemic Exclusion via Aadhaar Biometric Authentication:** Aadhaar's welfare delivery goals faced implementation failures, causing systemic exclusion of vulnerable populations. Technical issues like poor connectivity and fingerprint registration failures for labourers and the elderly have denied essential Public Distribution System (PDS) food rations. These failures caused severe adversities, including starvation and denied social security (Access Now, 2018).
- **Proliferation of "Dark Patterns" on Digital Platforms:** India faces digital consumer protection failures through dark patterns - interfaces designed to manipulate users, with 79% tricking users into surrendering personal data. This ethical gap led the government to classify 13 patterns as unfair trade practices (Law Web, 2025).
- **Aadhaar Cybersecurity and Data Privacy Breaches:** Aadhaar's centralised database has suffered repeated security failures and sensitive data exposure. Critics highlight the risk of putting all eggs in one basket as unauthorised access persists. Furthermore, UIDAI lacks transparency, failing to implement public bug disclosure programs and treating breach information as a "state secret" (Access Now, 2018).

Many of these challenges have been/ are being addressed subsequently. With rapid changes in technology and user preferences, new challenges keep arising.

Synthesis of Case Learnings & The Way Forward

Drawing on the analysis of global digital transformation efforts in Public Financial Management (PFM), the following learnings are structured to enhance quality and mitigate

“Governments must develop strategies to hire and retain specialist functional and IT talent, such as offering market-based salary scales or specific career paths, to prevent the loss of expertise to the private sector.”

implementation failures. Perspectives based on the 3PT framework³ deserve attention in this regard.

Policy Perspective: The Foundation of Integrity

- **Legal & Regulatory Realignment:** Transformation requires comprehensive legislation that provide a legal basis for electronic operations, including e-signatures, data privacy, and blockchain records. Traditional laws must be updated to mandate digital systems as the exclusive/single source of truth to eliminate manual loopholes.
- **Sustained Political Will:** Success depends on high-level political will that extends beyond single election cycles, as major reforms typically take 7 to 14 years to complete.
- **Holistic Reform Programmes:** Projects are more sustainable when framed as Public Expenditure Management reforms, which appeal to top policymakers rather than narrow technical accounting modernisation initiatives.

Process Perspective: Designing for Efficiency

- **Process Re-engineering (BPR) First:** Automating existing manual inefficiencies is counterproductive; various processes must be re-engineered for comprehensive control *before* technology is deployed.

³ <https://magc.in/magc-proprietary-tools/>



- **Phased, Test-and-Learn Rollout:** Governments should resist rapid national scaling and instead adopt a phased approach using pilots to troubleshoot first, managing stakeholder expectations, and demonstrating early integrity dividends.
- **Structured Controls:** To prevent gaps, systems should be designed to capture all stages of a transaction *ex-ante* (before payment is made), ensuring no expenditure occurs outside the digital audit trail.

People Perspective: Building a Digital Culture

- **Evidence-based decisions:** Technical training alone may not be adequate without a fundamental shift toward a data-driven culture. Managers and staff must move from discretionary to evidence-based decision-making.
- **Talent Acquisition & Retention:** Governments must develop strategies to hire and retain specialist functional and IT talent, such as offering market-based salary scales or specific career paths, to prevent the loss of expertise to the private sector.

“Machine learning algorithms should be leveraged to flag duplicate payments, suspicious supplier/contractor behaviours, and inflated invoices instantaneously, providing deterrents to misuse of resources.”

- **Stakeholder Engagement:** Active, regular communication with all users, including civil society and the private sector, is essential to overcome institutional resistance and build trust in new systems.

Technology & AI Perspective: The Frontier of Automation

- **AI as a Predictive Tool:** Governments should transition from reactive monitoring to predictive analytics. AI can process vast data volumes to detect fiscal stress earlier than quarterly reporting and forecast potential default patterns.
- **Real-time Anomaly Detection:** Machine learning algorithms should be leveraged to flag duplicate payments, suspicious supplier/contractor behaviours, and inflated invoices instantaneously, providing deterrents to misuse of resources.
- **Modernizing Legacy Systems:** To reduce technological deficiencies, agencies should move away from monolithic, unsupported architectures toward cloud-native, microservices-based, and API-based designs that allow for interoperable data sharing across departments.

- **Ethics & Algorithmic Scrutiny:** Adoption must include safeguards to mitigate algorithmic bias and adapt judicial review methodologies to ensure automated decisions maintain public values and human rights.

While governments need to leapfrog to bypass paper-based stages, such an approach is effective only if foundational legal and identity frameworks are present. Without these, legacy system inertia causes new digital tools to simply digitise inefficiency, failing to transform the underlying governance.

The Role of the Accounting Professionals in the PFM Digital Transformation

In the era of AI, the Human-in-the-Loop (HITL)⁴ is the final safeguard against judgmental atrophy. The accountant's role must evolve from bookkeeper to Digital Integrity Officer and Forensic AI Auditor.

Accountants are critical in validating AI-generated audit flags and ensuring that automated decisions comply with business and statutory requirements. Furthermore, the transition to accrual-based accounting, which as of 2021 has been adopted by only 30% of governments, is made feasible by digital transformation through automated reconciliations and real-time data ingestion (IFAC, 2021). Professional accountants are the key drivers of this transition, ensuring the “auditability” of complex blockchain ledgers and maintaining fiscal accuracy.

Conclusion

The digitisation of PFM is a structural necessity for the modern state. GTMI 2025 data confirms that while progress is being made, the journey is fraught with legal, social, and ethical complexities. Success requires a balanced approach: pairing advanced technologies like KSI

⁴ Human-in-the-loop (HITL) is a collaborative approach that integrates human input and expertise into the lifecycle of machine learning and artificial intelligence systems.

Blockchain and AI Auditing with robust compliance mechanisms. By empowering accounting professionals as the vanguard of digital integrity, governments can move from reactive monitoring to a future of predictive, data-driven stewardship, finally securing the state's engine room.

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