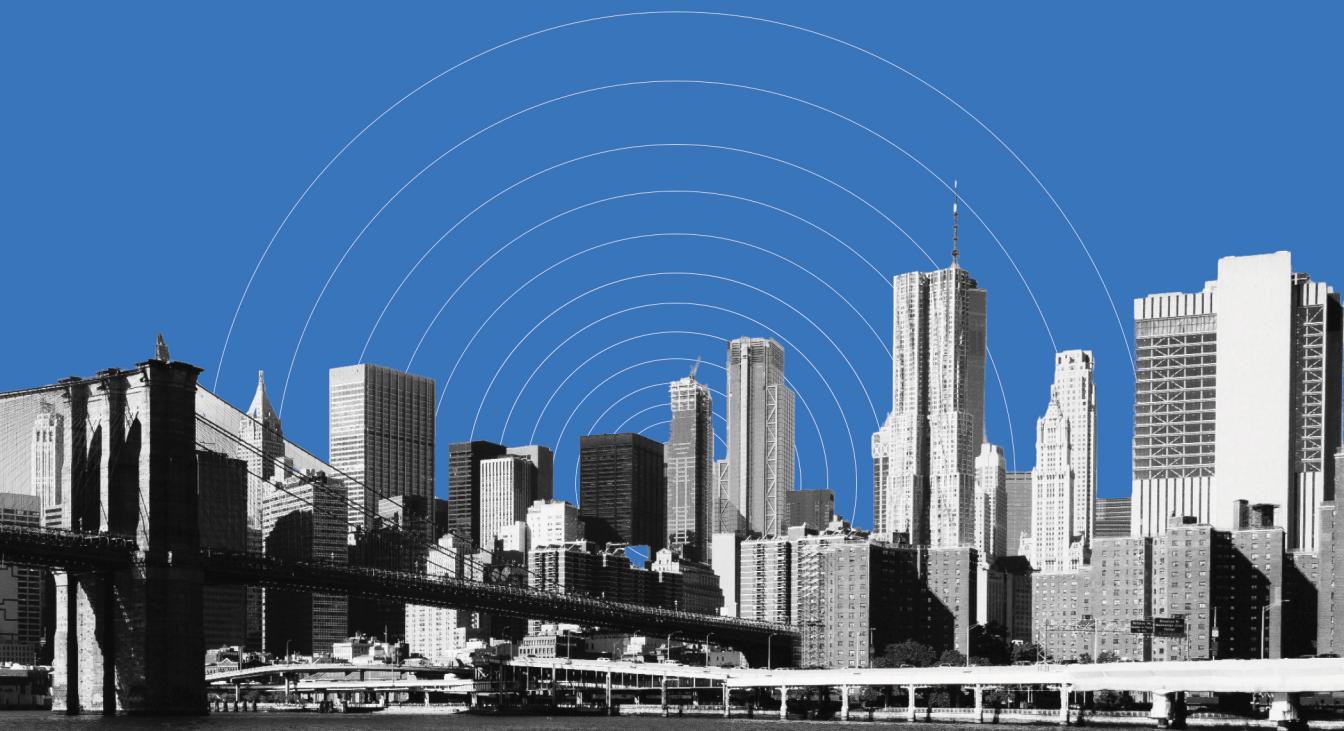


# Strategy and Approach to Public Financial Management

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PFM Transformation leveraging  
Fiscal & Service Events



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# 01

## Executive Summary

Governments are responsible for the creation and maintenance of public goods, and the delivery of public services and social welfare. In order to perform these functions, they require financial resources.

These resources are raised as revenues, mainly through taxes and fees; to the extent that government-owned entities (e.g. public sector undertakings) also earn revenues, these may further contribute to the pool of funds available for governments to spend. Further, governments may receive grants from other entities (e.g. multilateral development banks), and may borrow money (by taking loans, issuing bonds, etc.)

Public financial management (PFM) refers to “*the way governments manage public resources (both revenue and expenditure), and the immediate and medium-to-long-term impact of such resources on the economy and society... PFM has to do with both process (how governments manage) and results (the short-, medium-, and long-term implications of financial flows)*<sup>1</sup>”.

Good PFM practice requires governments to ensure that revenues are raised and spent efficiently, such that there is a net positive impact on public welfare. This can include the stock of public goods / infrastructure available, the inclusiveness of and ease of access to public services, and investments in human capital (in the form of education, public health, etc.) It also requires governments to manage debts prudently, in keeping with fiscal responsibility and budget management (FRBM) obligations.

Governments and financial institutions in India and around the world have adopted digital ways of working. Despite these reforms, however, visibility into fiscal status – the stocks and flows of public funds – remains a challenge. This leads to uncertainty, both within the government system, and among vendors to government. Such lack of visibility and certainty is by definition inefficient, raising transaction costs and risk premiums. It means that actors across the PFM landscape lack key information at the times when they have to act upon it.

Why do these gaps in financial information persist, even after digitisation of systems? This can be attributed to the number of entities involved, across tiers of the federal hierarchy, and the lack of standardisation in how their systems manage data. Even as many entities innovate and develop systems to address specific operational needs / challenges, the proliferation of such applications creates the need for a rapidly-growing number of point-to-point integrations – a complicated and expensive exercise. Without interoperability between these systems, consistent and comprehensive visibility is difficult to ensure.

Recent PFM reforms in India have attempted to address this challenge, especially in the context of centrally-funded schemes (e.g. through the Single Nodal Agency / Single Nodal Account reform)<sup>2</sup>. These efforts have led to notable progress, with greater visibility into the status of funds allocated in such schemes. However, this visibility is limited to treasury / finance systems: once money has been expended by the entity to whom it was allotted, there is limited information on the outputs and outcomes of that expenditure. While those entities report on utilisation status and results, such reporting suffers from the same gaps or challenges, in terms of data integrity (quality, reliability, timeliness) and interoperability.

<sup>1</sup>Andrews et al (2014), “This is PFM” (Harvard CID Working Paper)

<sup>2</sup><https://pib.gov.in/Pressreleashare.aspx?PRID=1831876>

In this paper, we propose that this set of challenges across the PFM landscape and lifecycle can be reduced to a single pivotal problem: the fragmented nature of information flows between government financial systems and across financial and operational systems.

We propose an approach to address this challenge, by using standardised fiscal and service events and a data exchange platform to create interoperability of information flows. The current draft of this paper explains fiscal events in detail, and illustrates their potential application. Future drafts will seek to explain service events in greater detail.

In this paper, we outline 9 fiscal events, further split into three categories<sup>3</sup>:

Planning Events	Revenue Events	Expenditure Events
Plan	Demand	Bill
Estimate	Receipt	Payment
Sanction	Credit	Debit

These event specifications cover the entire PFM lifecycle, and take into account the needs of actors across the PFM landscape. When PFM information is encoded using these event specifications, it creates semantic and syntactic interoperability across the range of software systems in use. When combined with a data exchange platform – the India Financial Information Exchange (iFIX) – they provide a way to operationalise interoperability and remove the fragmentation of PFM information flows.

This not only provides real-time visibility into status and flow of funds / revenues, but also enables better policymaking and policy implementation. Planning, budgeting, and forecasting can be done on the basis of more complete, timely, and reliable data, enabling better projection of funds needed for and potential impact of various policy options.

Governments at all tiers, but especially local governments, can engage in more structured and targeted revenue mobilisation, tapping into data from multiple operational systems to gain a more holistic view of the revenue potential of their jurisdictions. Forecasts of revenues and liabilities (future expenditures) can be built using this data.

Standardised fiscal events also provide avenues for improving the inclusiveness of budgeting, as they create a scaffolding for participatory and bottom-up budgeting processes, across tiers of the federal hierarchy. They also enable better categorisation of planned and actual expenditures by priority themes, such as for gender budgeting, climate / green budgeting, etc.

More broadly, the integration of fiscal and service events allow for effective output and outcome reporting, with links between specific outlays, outputs, and outcomes evident from reliable, system-sourced data. This is also of great significance in the auditing stage of the PFM lifecycle,

where lack of reliable data is a key challenge; an events-based data exchange system can enable even real-time auditing and anomaly detection.

Finally, the introduction of fiscal and service events can address one of the most visible challenges of government operations today, which is the challenge of delayed or unreliable payments to vendors, contractors, and sometimes even to beneficiaries. Standardised events lay the foundation for execution of smart contracts and smart payments, reducing the administrative burden on capacity-constrained government officials to verify and process payments.

In the final section of this paper, we look at steps that various actors across the PFM landscape can take to adopt and further refine this approach. Specifically, we look at union government, state governments, and constitutional authorities (such as the Comptroller and Auditor General, the Finance Commissions, etc.), and how standardised fiscal events could be introduced and leveraged within their mandates and operations. We also consider the role that private sector stakeholders can play; while banks are a necessary participant in any such effort, we also look at what can be done by vendors to government, and by academic institutions and researchers.

In summary, this paper identifies key challenges that affect the PFM landscape in India, studies the role of fragmented information flows as a common element across these challenges, and proposes an approach to resolve this fragmentation by leveraging standardised fiscal and service events. Together with a data exchange platform, this events-based approach can significantly improve interoperability, transmission of information, and reliability, quality, and timeliness of data itself.

Such timely visibility can enable multiple reforms, both in terms of PFM practices throughout the PFM lifecycle, as well as in terms of better (more efficient, more inclusive) targeting of

<sup>3</sup>See Section 4(c) for definitions of these events

## 02

# Public Financial Management (PFM) in India

## Public Financial Management (PFM) Overview / Key Terms

Public financial management (PFM) has been defined as “*the way governments manage public resources (both revenue and expenditure), and the immediate and medium-to-long-term impact of such resources on the economy and society. As such, PFM has to do with both process (how governments manage) and results (the short-, medium-, and long-term implications of financial flows)*”<sup>1</sup>.

***Governments raise funds, and then use them to deliver an improved quality of life for all of their constituents. This can take the form of:***

- Creating and maintaining public goods (physical & digital infrastructure)
- Delivering public services (security / law and order, health, education,etc.)
- Delivering social welfare to residents (in kind, e.g. public distribution system, social safety net schemes, direct benefit / cash transfers etc.)

***PFM thus refers to a set of processes, by which a government:***

- Forecasts and tracks funds raised or received, and hence available to spend;
- Decides how these funds will be spent, across multiple tiers of government and across multiple different ministries, departments, schemes, etc.
- Tracks the actual transfer of funds across these various functions, until their expenditure.
- Tracks outputs & outcomes of such expenditure.

***As part of doing the above, PFM can also encompass:***

- Processes undertaken to ensure that revenues and expenditures are recorded and managed in compliance with rules, with no leakages;
- Processes and reforms undertaken to improve quality of expenditure, i.e. to improve the outputs / outcomes created by such expenditure; and
- Processes and reforms undertaken to manage government borrowings/debt in a prudent-manner.

<sup>1</sup>Andrews et al (2014), “This is PFM” (Harvard CID Working Paper)

## PFM Landscape in India

In general, the PFM lifecycle can be broken down into the following phases:

- Budget Formulation / Preparation
- Budget Enactment / Legislative Approval
- Budget Implementation / Execution
- Audit

As budgeting is an annual exercise, these steps tend to overlap. Typically, the budget preparation for the forthcoming financial year, budget execution for the ongoing financial year, and audit for the previous financial year may all be taking place at the same time.

This overlapping PFM lifecycle is why the annual budget statement presents three sets of figures. For instance, for the budget speech made on 1st February, 2023:

- The Budget Estimates (B.E.) are projected numbers for the coming financial year (2023-24)
- The Revised Estimates (R.E.) are revised numbers for the ongoing financial year (2022-23)
- The Approved Estimates (A.E.), also known as actual or final numbers, are the audited numbers for the previous financial year (2021-22)

In the Indian context, PFM takes place across multiple tiers of government, and involves multiple actors across these tiers:

- » **UNION:** Legislature, Executive, Constitutional Authorities (e.g. Union Finance Commission, Supreme Audit Institutions)
- » **STATE:** Legislature, Executive, Constitutional Authorities (e.g. State Finance Commission)
- » **DISTRICT<sup>2</sup>:** and its sub-divisions: Many union and state government-funded schemes are executed at the district level. Plans from rural local bodies are consolidated at the district level (Zila Parishad).
- » **LOCAL<sup>3</sup>:** Panchayati Raj Institutions (PRIs) and Urban Local Bodies (ULBs).

<sup>2</sup>A district or zila is an administrative divisions within a state. Currently, India has approximately 750 districts. These are further split into sub-divisions, known variously as tehsil, taluk, mandal, or block.

<sup>3</sup>In 1992, in an effort to decentralise governance, the 73rd and 74th Amendments to the Constitution of India created a "third tier" of government, consisting of the PRIs and ULBs respectively.

During budget implementation, two other sets of actors to keep in mind are:

- **VENDORS** (whose services are procured by government), and
- **BANKS** (who process fund transfers, to and from government entities).

In general, the steps taken by each of these actors throughout the PFM lifecycle are governed by a set of rules known as the General Financial Rules, which are published and periodically revised by the Department of Expenditure, Union Ministry of Finance. The rules are a compilation of directions and provisions followed by all offices of the Union Government to deal with matters of financial nature.

First issued in 1947, the rules and orders are observed as executive instructions by all Departments and Organisations under the Government of India. While the 1947 document sought to bring together all existing orders and instructions related to financial rules, amendments in 1963, 2005 and 2017 have attempted to enable efficiency in government processes while maintaining administrative due diligence.

*The table below summarizes key PFM-related processes in India:*

**Table 1: PFM-Related Processes, Actors, and Roles**

Process	Activity	Actor	Role
Budget Formulation	Preparation	Executive (mainly Union)	Issue of Budget Circular [Union Budget]
			Pre-Budget meetings
Budget Formulation	Planning & Estimation	Executive at all levels (Union, State, District, Local, Sub-local)	Forecast / plan revenues Plan expenditures Prepare detailed estimates of planned expenditures
Budget Formulation	Preparation of Finance	Executive (Union, State)	Formulate budget for the upcoming financial year
Legislative Approval	Passing of Finance Bill	Legislature (Union, State)	Debate and approve budget for upcoming financial year
Budget Execution	General	Executive at all levels	Collect revenues

<sup>4</sup>The list of subjects these bodies are mandated to work on is provided in the 11th & 12th Schedule of the Constitution (Art. 243G, 243W).

<sup>4</sup>General Financial Rules, 2017: [https://doe.gov.in/sites/default/files/GFR2017\\_0.pdf](https://doe.gov.in/sites/default/files/GFR2017_0.pdf)

Process	Activity	Actor	Role
			Make expenditures as per budget / approved plans  Make payments to staff (salaries, pensions)  Make payments to vendors & contractors
Budget Execution	Control of Expenditure	Heads of Departments, Controlling Officers and Drawing and Disbursing Officers	Identification of disproportionate expenditure  Allotment for Excess Expenditure  Maintenance of Liability Statements
Budget Execution	Accounting	Executive at all levels (mainly finance / accounts departments & officials)	Maintain accounts of all revenues, expenditures, debts, assets etc., as per accounting manuals.
Auditing	Audit of Revenue & Expenditure	CGA, CAG, and other officers at all levels	Accounts prepared by CGA and audited by CAG  Detect and investigate anomalies, deviations from budgets or rules etc.
Review	Monitoring & Evaluation	DMEA, NITI Aayog  State M&E Departments	Monitoring progress and efficacy of strategic and long-term policy and program frameworks
Financial Strategy and Reforms	Allocation strategy	Union Finance Commission  State Finance Commissions	Recommend formula for sharing of funds between Union, State, and Local Governments
Financial Strategy and Reforms	Financial reforms	Union Executive (Ministry of Finance)  State Executive (Ministry of Finance)  Chief Economic Advisor, Economic Advisory Council, NITI Aayog, other experts,	Recommend reforms to finance and governance, including PFM processes. Accept and implement FC recommendations.

## PFM and Local Governments in India

Starting with the Xth Union Finance Commission (FC), successive FCs have made recommendations for grants to local governments<sup>5</sup>.

- The XIVth FC had allocated ~Rs. 288 thousand crores in grants to local governments for the period 2015-2020;
- The (most recent) XVth FC has allocated ~Rs. 436 thousand crores, an increase of approx. Rs. 150 thousand crores (or 50% of the 2015-20 allocation)<sup>6</sup>.

The XVth FC included certain conditions that state and local governments will have to comply with in order to continue receiving grants<sup>7</sup>:

- All state governments must constitute State Finance Commissions (SFCs); the SFCs must publish reports and recommendations, and state governments must table an explanatory memorandum detailing action taken on the recommendations before the state legislature no later than March 2024.
- Local governments (ULBs and PRIs) should publish provisional and audited accounts in the public domain. Allowing some time for transition, a minimum of 25% of ULBs in each state are expected to report in this manner in the current financial year (2022-23).
- In addition, ULBs must publish their current level of property tax collection; taking this amount as the floor level, they must improve these collections by the same percentage, year-on-year, as the growth rate of the state GDP<sup>8</sup>.

Bolstering local government own revenue, strengthening accounting systems and practices, and increasing transparency of fiscal information are thus priorities identified by the XVth FC. ULBs can work together with Line Departments and the Finance Department throughout the PFM lifecycle to ensure this information is recorded accurately and transmitted in a timely manner.

<sup>5</sup>Xth FC, Recommendations

<sup>6</sup>XIVth FC, Recommendations

<sup>7</sup>XVth FC, Recommendations. See Summary from PRS Legislative Research.

<sup>8</sup>For instance, if the State of Punjab's GSDP grows by 6% in FY22-23, the ULB of Amritsar should also show a minimum 6% increase in property tax collections for that year.

## PFM Digitisation Reforms in India: PFMS, SNA, and IFMS

The World Bank refers to systems that integrate financial information and public finance, with a central data warehouse to record and report all daily financial transactions, thus offering reliable consolidated platforms, as integrated FMIS (or IFMIS)<sup>9</sup>. Establishment of an IFMIS has become an important benchmark for a country's budget reform agenda. The IMF holds that FMIS could be "regarded as a precondition for achieving effective management of the budgetary resources<sup>10</sup>". In India, this functionality comes from a mix of state IFMS, central PFMS, and now the Single Nodal Agency / Single Nodal Account (SNA) system.

Initially launched as the Central Plan Schemes Monitoring System (CPSMS), the Public Financial Management System (PFMS) is a web-based software implemented by the Controller General of Accounts (CGA), Department of Expenditure, Ministry of Finance<sup>11</sup>. **The primary function of PFMS is to facilitate management of finances for the government of India by establishing an efficient fund flow system, covering both accounting and payments.** The scope of PFMS has expanded to include direct payment to beneficiaries under Plan and non-Plan Schemes (in 2013), and digitisation of accounts (in 2014).

PFMS has interfaces with the treasury systems of all Indian States and UTs, enabling exchange of data regarding budget, allocation, and expenditure against funds transferred under Centrally Sponsored Schemes. The system is also linked to the Core Banking Systems (CBS) of more than 300 banks, and working towards establishing an interface with all banks operating in India. Aadhar-linked payments are also facilitated through an interface with the National Payments Corporation of India (NPCI). It thus serves as a real-time management information system and decision support system for various stakeholders.

All Departments and Ministries transfer funds electronically to beneficiaries (individual or institution) through PFMS. There are interfaces with around fifty beneficiary management applications/systems of different Ministries and Departments (e.g. PM-KISAN, NSAP, MNREGASoft, AwaasSoft etc.) to allow State Governments and Implementing Agencies to transfer cash to beneficiaries directly<sup>12</sup>.

The transformation of PFMS is an ongoing process, with PFMS 2.0 – an effective, engaging, productive and efficient platform developed through design thinking – being in the

pipeline. The new platform seeks to incorporate things like AI, ML, Deep Learning, Hyper-stability and scalability, open KPI framework, Hybrid Cloud etc<sup>13</sup>.

*In 2021, the Ministry of Finance initiated a major public finance reform with the introduction of the Single Nodal Agency (SNA) model<sup>14</sup>.* The reform modified the procedure of fund release to states, by mandating all state governments to designate a SNA for each scheme. The SNA must open a Single Nodal Account (an interest-bearing savings account) in a Scheduled Commercial Bank authorised to conduct government business.

Implementing Agencies in turn must open zero-balance subsidiary accounts under the concerned SNA's account, with clearly defined drawing limits. Each time a payment is to be made to beneficiaries, vendors, etc., the Implementing Agency in question raises a request for payment, and funds are drawn down to the relevant account from the SNA for making that payment. This removes the possibility of funds being parked unspent in multiple accounts (held by multiple implementing agencies / tiers of government).

**States in India have adopted IFMIS to consolidate financial information at the state level and support larger financial management methodologies. Some of the features of IFMS seen across states include:**

- Real-time payment system for integration with RBI's eKuber system for routing government payments for crediting across all banks. It works as a uniform model for crediting money to accounts across all banks in India. [Telangana, Uttar Pradesh, Punjab, Uttarakhand, etc.]
- MIS Reports for getting details on Receipts, Expenditure, Pensions, Remittances, Employee details, etc. along with analytical reports generated using different kinds of financial data. [Telangana, Uttar Pradesh, Punjab, Uttarakhand, West Bengal, etc.]
- Generation of financial intelligence using data – through MIS or otherwise – to conduct trend analysis and help Departments make decisions [Telangana, Uttar Pradesh, Punjab, Uttarakhand, West Bengal, etc.]
- Monitoring and control of state revenue and expenditure through digital capabilities to manage funds and monitor government liabilities, among other things [Telangana, Uttar Pradesh, Punjab, Uttarakhand, West Bengal etc.]
- Pension systems, to help pensioners track their entitlements and streamline payments from the state treasury [Uttar Pradesh, Punjab, West Bengal]

<sup>9</sup><https://www.worldbank.org/en/topic/governance/brief/financial-management-information-systems-fmis>

<sup>10</sup><https://www.imf.org/external/pubs/ft/wp/2005/wp05196.pdf>

<sup>11</sup><https://cgac.nic.in/Page/PFMS.aspx>

<sup>12</sup><https://www.nic.in/products/public-financial-management-system/>

<sup>13</sup><https://pfms.nic.in/static/NewLayoutCommonContent.aspx?RequestPageName=Static/Implementation.aspx>

<sup>14</sup><https://pib.gov.in/Pressreleaseshare.aspx?PRID=1831876>

## Illustration of PFM Processes across multiple tiers of government<sup>15</sup>

MGNREGS	MDM	NHM	PM-KISAN	KVS	KALIA
About the Scheme	Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) is meant to provide at least 100 days of wage employment, per financial year, to every rural household whose adult members are willing to do unskilled manual work.	Mid-Day Meal (MDM)- Pradhan Mantri Poshan Shakti Nirman-scheme aims to enhance enrolment, retention and attendance and to simultaneously improve nutritional levels among children up to class 8 studying in schools. Mid-Day Meals are served on all working days in the school. There is also a provision to provide MDM to school children in summer vacations in drought-affected areas.	National Health Mission (NHM) for universal access to equitable, affordable and quality health care services. The main programmatic components of the scheme include Health System Strengthening, Reproductive-Maternal-Neonatal-Child and Adolescent Health, and Communicable and NCDs.	Pradhan Mantri Kisan Samman Niyoji (PM-KISAN) provides financial support to farmers across the country. Farmers are entitled to receive Rs. 6,000 per year in three equal installments of Rs. 2,000 each. The scheme aims to support farmers in acquiring various inputs to increase crop yield and income.	Krushak Assistance for Livelihood and Income Augmentation (KALIA) scheme of the Govt. of Odisha provides income support to farmers engaged in small-scale farming, sharecropping, fishing, and animal herding.
Scheme Type	Centrally Sponsored Scheme	Centrally Sponsored Scheme	Centrally Sponsored Scheme	State Scheme	State Scheme

<sup>15</sup> We are grateful to the Centre for Budgetary Governance and Accountability for inputs to this section.

MGNREGS	MDM	NHM	PM-KISAN	KVS	KALIA
Funding Pattern	States for which it is 90:10	The Centre-State fund sharing pattern varies across components of the scheme -For major components the Centre-State fund sharing ratio is 60:40 for all States, except for the N.E. and Himalayan States for which it is 90:10	The Centre-State fund sharing ratio is 60:40 for all States, except N.E. and Himalayan States for which it is 90:10	-Fully funded by the Govt	-Fully funded by the State Government (Odisha)
Scheme Type	N.E. and Himalayan States for which it is 90:10				

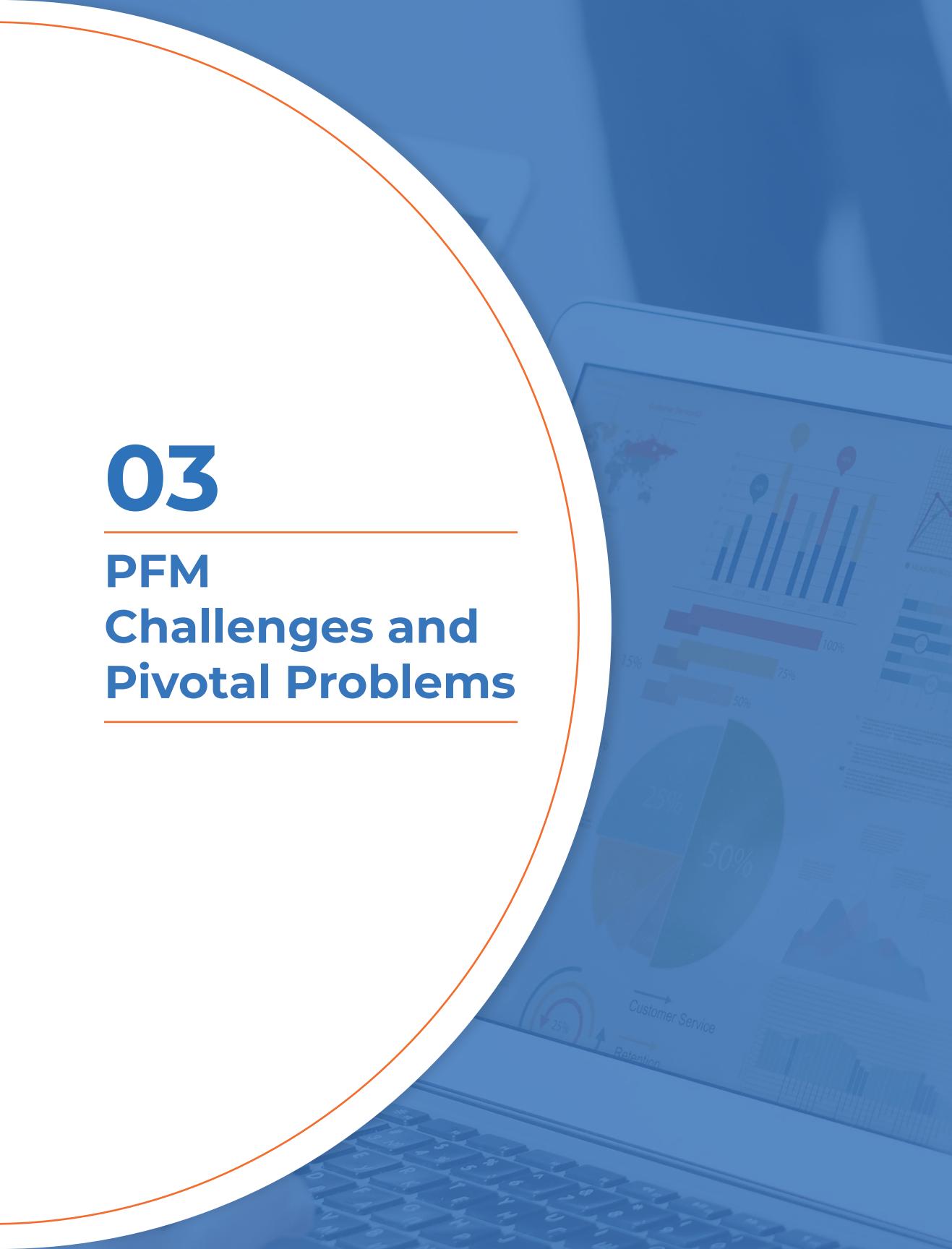


## What components of PFM do different tiers of government do for the scheme?

Union		MDM	NHM	PM-KISAN	KVS	KALIA	
- Consolidation of plan and proposals - Programmatic approval - Budget allocation - Budget authorization - Release of funds - Expenditure review and monitoring - Accounting and auditing - Consolidating progress reports		- Consolidation of annual plans - Programmatic approval - Issue of scheme guidelines - Budget allocation - Budget authorization - Release of funds - Programme and expenditure review, and monitoring - Accounting and auditing - Consolidating progress reports	- Consolidation of demands and proposals for budget approval - Programmatic approval - Budget allocation - Budget authorization - Release of funds - Programme and expenditure review - Accounting and auditing - Consolidating progress reports	- Programmatic approval - Budget allocation - Release of funds - Programme and expenditure review - Accounting and auditing - Consolidating progress reports	- Programmatic approval - Budget allocation - Release of funds - Programme and expenditure review - Accounting and auditing - Consolidating progress reports	- Consolidation of plan and proposals - Programmatic approval - Budget allocation - Release of funds - Programme and expenditure review and monitoring - Accounting and auditing - Consolidating progress reports	- Consolidation of plan and proposals - Final Approval of eligible farmers list preparation and validation
- Consolidation of plan and proposals from the Center - Budget authorization - Release of funds - Fund management		- Consolidation of plan and proposals from the Center - Budget authorization - Release of funds - Fund management	- Identification and consolidation of beneficiaries - Consolidation of Budget - Demand for funds - Budget authorization	- Advise the Commissioner in financial, accounting and audit matters pertaining to the Sangathan and its constituent units	- Review monitoring and implementation of Scheme - Final Approval of eligible farmers list preparation and validation	- Review monitoring and implementation of Scheme - Final Approval of eligible farmers list preparation and validation	
District		MDM	NHM	PM-KISAN	KVS	KALIA	
- Consolidation of proposed work - Demand for funds - Fund management - Concurrent budget monitoring		- Consolidation of beneficiary list and cost proposals - Demand for funds - Release of funds - Fund management	- Consolidation of activities and cost proposals - Demand for funds - Fund management - Concurrent budget monitoring	- Consolidation of activities and cost proposals - Demand for funds - Fund management - Concurrent budget monitoring	- Preparing progress reports	- Keeping records of beneficiaries - Preparing progress reports	- Approval of eligible list of Small and Marginal farmers by Block Level Nodal Officers for DBT - Monitoring of the Scheme - Keeping records of beneficiaries - Preparing progress reports
Block		MDM	NHM	PM-KISAN	KVS	KALIA	
- Preparation of the list of beneficiaries - Preparation of cost proposals - Demand for funds - Incurring expenditure - Maintaining expenditure records - Submission of MPRs/QPRs/APRs		- Preparation of the list of beneficiaries - Preparation of cost proposals - Demand for funds - Incurring expenditure - Maintaining expenditure records - Submission of MPRs/QPRs/APRs	- Preparation of the list of beneficiaries - Preparation of cost proposals - Demand for funds - Incurring expenditure - Maintaining expenditure records - Submission of SoE	- Preparation of the list of beneficiaries - Preparation of cost proposals - Demand for funds - Incurring expenditure - Maintaining expenditure records - Submission of SoE	- Preparation of the list of beneficiaries - Preparation of cost proposals - Demand for funds - Incurring expenditure - Maintaining expenditure records - Submission of SoE	- Selection of Small and Marginal farmers by the GP level nodal officers for DBT - Preparing the total number of beneficiaries - Keeping records of beneficiaries	- Preparation of the list of activities / proposals - Preparation of cost proposals - Submission of cost proposals - Demand for funds - Incurring expenditures - Maintaining expenditure records - Submission of SoE
Local		- Preparation of the shelf of projects - Preparation of budgets - Demand for funds - Distribution of works - Maintaining expenditure records - Submission of statement of expenditures (SoE) - Submission of progress reports	- Preparation of the shelf of projects - Preparation of budgets - Demand for funds - Distribution of works - Maintaining expenditure records - Submission of MPRs/QPRs/APRs	- Preparation of the shelf of projects - Preparation of budgets - Demand for funds - Distribution of works - Maintaining expenditure records - Submission of SoE - Submission of progress reports	- Preparation of the shelf of projects - Preparation of budgets - Demand for funds - Distribution of works - Maintaining expenditure records - Submission of SoE - Submission of progress reports		

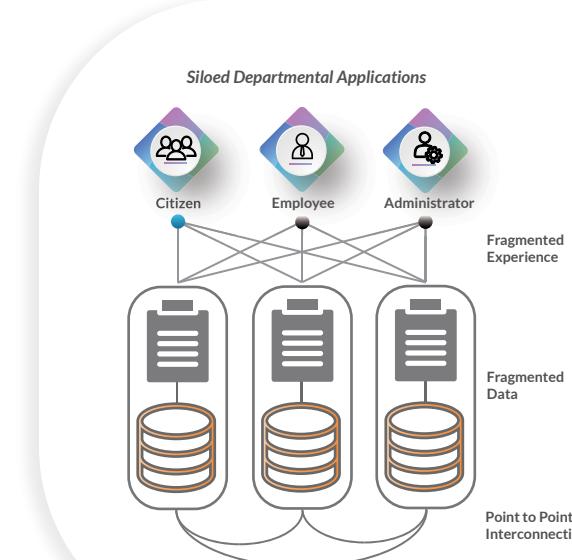
# 03

## PFM Challenges and Pivotal Problems



### PFM Challenges in India

*The Application-based Approach solves individual program or department problems*



The previous section outlines the large number of entities involved in PFM processes in India, across multiple tiers of government. Any given mission, scheme, department etc. can create or adopt systems, such as dashboards or management information systems (MIS), to track and make visible information on budgets and fund availability, budget execution status, and attainment of scheme outcomes.

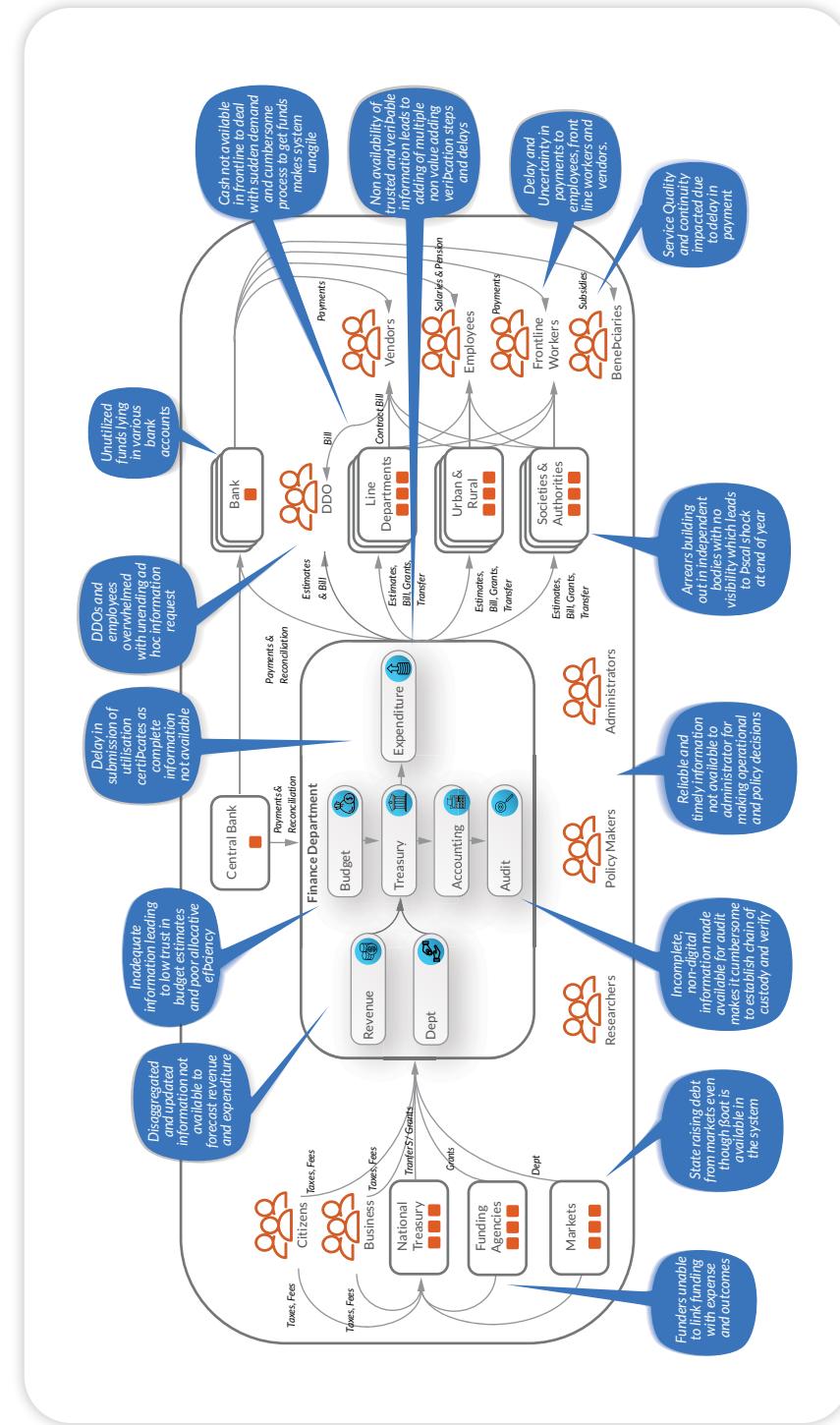
Given the sheer number of actors, missions, heads of expenditure, etc., this means a large and growing number of systems, each collecting and recording information in various formats, at various frequencies, with limited ways to communicate with each other.

Data is thus stored across multiple different systems or databases. This often leads to DUPLICATION of data collection and/or analysis, which is a wasteful use of resources, and is frustrating for those who have to provide the same data repeatedly. It also creates INCONSISTENT DATA, where information on the same individual is recorded in ways that are difficult to align, or even contradictory.

With hundreds or even thousands of such entities (ministries, departments, missions / schemes, states / districts / local governments, disbursing entities, line departments / implementing entities) operating in parallel, the complexity of this system and costs of coordination and duplication can be significant.

This creates a range of coordination challenges, which in turn lead to delays in both action and reporting, as summarised in the images.

### Coordination problems affect actors at all tiers of government



<sup>16</sup>Funding Agency: provides or approves funds, e.g. finance ministry / department, development bank, etc.  
Implementing Agency: incurs expenditures to deliver public goods / services / welfare, e.g. any line ministry / department, local government entity, parastatal / public utility etc.

Figure 2

## PFM-related coordination problems affect both funding & implementing agencies<sup>16</sup>

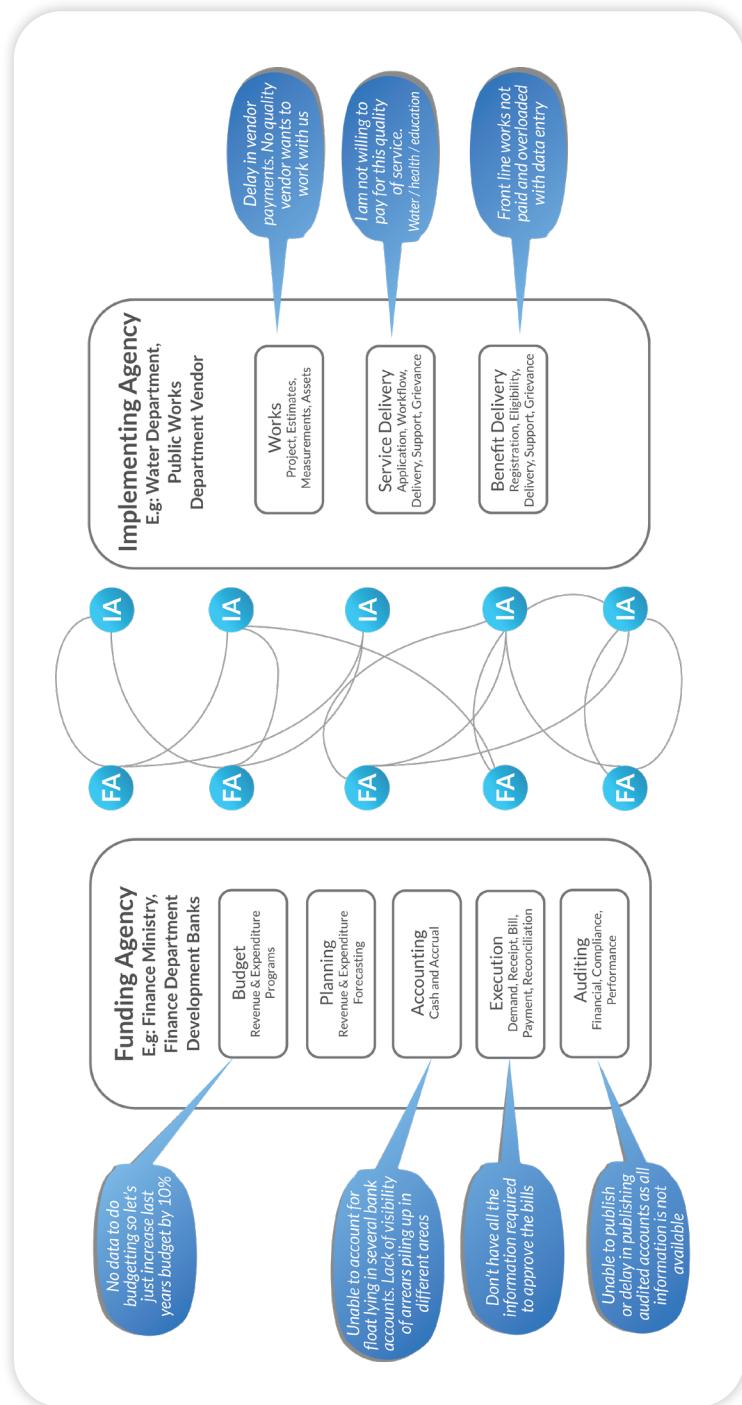


Figure 3

<sup>16</sup> Funding Agency: provides or approves funds, e.g. finance ministry / department, development bank, etc.  
Implementing Agency: incurs expenditures to deliver public goods / services / welfare, e.g. any line ministry / department, local government entity, parastatal / public utility etc.

*The lack of smooth & timely information flow affects every PFM process:*

Table 2: PFM Challenges, by Process, across the PFM lifecycle

Process	Activity	Actor	Challenges
Budget Formulation	Preparation	Executive (mainly Union)	Limited visibility into outputs / outcomes of allocated funding from previous years
Budget Formulation	Planning & Estimation	Executive at all levels (Union, State, District, Local, Sub-local)	'Incremental' planning - making small changes from previous year's allocation & plan, rather than detailed and responsive plans based on reliable data and robust bottom-up / participative processes
Budget Formulation	Preparation of Finance	Executive (Union, State)	Limited confidence in link between expenditures and outputs / outcomes, requiring multiple assumptions to be made during budgeting
Legislative Approval	Passing of Finance	Legislature (Union, State)	Limited ability to have a genuinely data-informed debate on projected revenues and proposed expenditures, as figures from the previous financial year are still provisional, and the basis of estimates for the coming financial year is shallow.
Budget Execution	General	Executive at all levels	Uncertainty about timely availability of funds, even if within ceilings set / even if committed in budget.  Lack of certainty in fund flow leads to float (allocated but unspent cash), delays in payments to vendors or staff, etc.  Delays in turn give rise to litigation, and/or hesitation among vendors to work with the government. Vendors can charge a higher price,

Process	Activity	Actor	Challenges	Process	Activity	Actor	Challenges	
Budget Execution	Control of Expenditure	Heads of Departments, Controlling Officers and Drawing and Disbursing Officers	Reliance on cumbersome Utilisation Certificate process; Non-availability of all relevant data in single system or interface. Integration or interoperability challenges between multiple systems, increasing amount of coordination work to be done manually. Need to search, compile, and/or report data in multiple formats to multiple entities.	Financial Strategy and Reforms	Allocation strategy	Union Finance Commission State Finance Commissions	Limited visibility into finances, expenditures, and achievement of targets and milestones; lack of complete or reliable data for assessment and formulation of policy recommendations.	
Budget Execution	Accounting	Executive at all levels (mainly finance / accounts departments & officials)	Variations in accounting methods and practices followed at different tiers of government.  Multiple non-integrated / non-interoperable systems used, with associated costs, coordination efforts, and possibility of vendor lock-in.	Financial Strategy and Reforms	Financial reforms	Union Executive (Ministry of Finance) State Executive (Ministry of Finance) Chief Economic Advisor, Economic Advisory Council, NITI Aayog, other experts, etc.	Limited visibility into finances, expenditures, and achievement of targets and milestones; lack of complete or reliable data for assessment and formulation of policy recommendations.	
Auditing	Audit of Revenue & Expenditure	CGA, CAG, and other officers at all levels	Non-availability of relevant data in a single system or interface.  Tracking down details of a specific transaction can be a very time-consuming and effort-intensive process.  Limited ability to leverage technology, such as automated anomaly detection systems.	These gaps in the PFM processes, stemming from lack of effective data-sharing and coordination, in turn lead to a series of more visible inefficiencies and challenges:				
Review	Monitoring & Evaluation	DMEA, NITI Aayog State M&E Departments	Key link - between expenditures, outputs, and outcomes - not tracked in any single or integrated system.  In the case of missions or schemes, need to work with multiple mission-specific MIS, increasing cost / effort of coordination, and making policy-level comparability (hence, estimation of cost-effectiveness across alternatives) difficult.	<p><b>UNPAID BILLS: Vendors and suppliers to the government struggle to receive timely payment of bills / invoices.</b></p> <ul style="list-style-type: none"> <li>As noted above, officials in implementing agencies are unsure of whether or when they will receive committed funds. They are also unsure if some unplanned expense or bill will arise.</li> <li>In the absence of this information, officials may choose to leave bills unpaid until specifically compelled to do so. (At other times, they may genuinely lack the liquid funds to make payments.)</li> <li>In case of extended delays or non-payments, vendors may have little choice but to stop supplying to government. In the most extreme cases, these could be critical supplies, such as medicines or oxygen for government hospitals.</li> </ul> <p><b>DECREASE IN NUMBER OF VENDORS willing to work with government: Over a period of time, lack of clarity on whether and when payments will be made leaves many vendors unwilling to supply to government agencies altogether.</b></p> <ul style="list-style-type: none"> <li>Vendors who are willing to accept the risk of uncertain or delayed payments are either charging a premium (making them unlikely to be selected in an L1 procurement system) or finding other means to cut down on margins, which might lead to lower quality of outputs.</li> <li>In the context of public goods, this can mean additional expenses incurred on maintenance or repairs in subsequent years; in case of public services, it can mean errors or exclusion of entitled persons.</li> </ul>				

## Pivotal Problem: Information Flows Are Fragmented

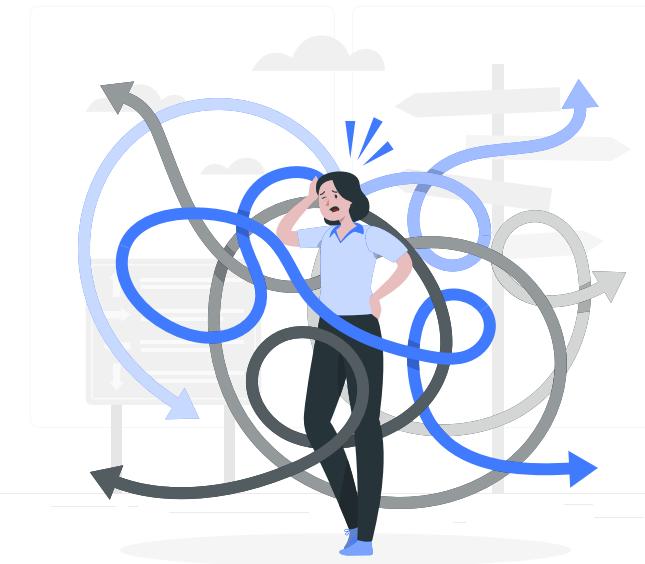
At the heart of all of these challenges is the lack of smooth data flows at multiple levels: within government agencies and departments, across departments in the same tier, and across different tiers. Data flows continue to be impeded due to challenges with both, digitisation and interoperability<sup>17</sup>.

**DATA GAPS:** At various points in the chain of creating public goods / delivering public services / delivering welfare schemes, data continues to be recorded on paper, or not recorded at all.

- Such gaps in data create possibilities for errors and/or manipulation.
- While data recorded on paper may be digitised manually (e.g. by a data entry operator), this creates time lags, and again leaves opportunities for errors and/or manipulation.
- Even ostensibly “digitised” data may be in formats that make further analysis or sharing difficult, e.g. photographs of physical record books.

**LACK OF STANDARDISATION:** With digital or digitised data, the format in which it is recorded may not be standardised.

- Entities that are recording or digitising data do so as per their own ways of working, rather than for wider usability.
- Digital tools and databases being used in government may record data in idiosyncratic or proprietary formats, or in other ways that do not allow for its sharing.
- Different entities use the same term without streamlining definitions or master data, i.e. no semantic interoperability between datasets.
- In addition, a given system may be unable to parse a query from another system, and/or return a response which that system can parse – i.e. no syntactic interoperability between systems.
- Since such databases, dashboards, reports etc. are developed to meet the needs of a given scheme, rather than overall PFM oversight, the timeliness of data availability and updating can also vary<sup>18</sup>.



**HIGH COST OF COORDINATION:** Due to the lack of standardisation, getting any two systems to speak to each other / successfully exchange information requires additional efforts.

- Given the sheer number of systems & apps, the expense of such point-to-point integration is prohibitively large.
- While this has been resolved to some extent within treasury systems (see Sec. 1d on Digital PFM reforms), there remains low interoperability between financial and service / operational systems. This means that even if there are logical links between specific fiscal events and service events – for instance, completion of certain work should result in payment of a vendor – the information related to the service event is in one system (which may or may not be digital), and the information needed to initiate, approve, and complete the payment is in a second system.
- In practice, coordination between systems is done manually – that is, some individual is responsible for looking up data in one system and entering it into another system. In addition to being a low-value use of this resource's time, such manual data entry again brings in scope for errors and/or manipulation, and means that the process as a whole is orders of magnitude slower than it would have been if these systems had been interoperable.
- In the context of access to services or social welfare, the burden of coordination often falls upon the individual who is seeking access to these; it is the individual who has to provide the same information to multiple entities on multiple occasions, with each such interaction increasing the risk of failure and/or exposure to rent-seeking behaviour. To the extent that such individuals may face financial and/or time poverty, this coordination effort can be a barrier to their being included in the welfare system at all.

<sup>17</sup>See, for instance, the New Interoperability Framework for European Public Services (EU 2017)

<sup>18</sup>NITI Aayog DMEO (2022), “A Review of Application of IT and Technology in Government Schemes”, [https://dmeo.gov.in/sites/default/files/2022-04/Theematic\\_Report\\_IT\\_%26\\_Technology\\_in\\_Government\\_Schemes\\_11042022.pdf](https://dmeo.gov.in/sites/default/files/2022-04/Theematic_Report_IT_%26_Technology_in_Government_Schemes_11042022.pdf)

*Flow of money is linked to flow of information – and flow of information is slow, incomplete, and inconsistent.*

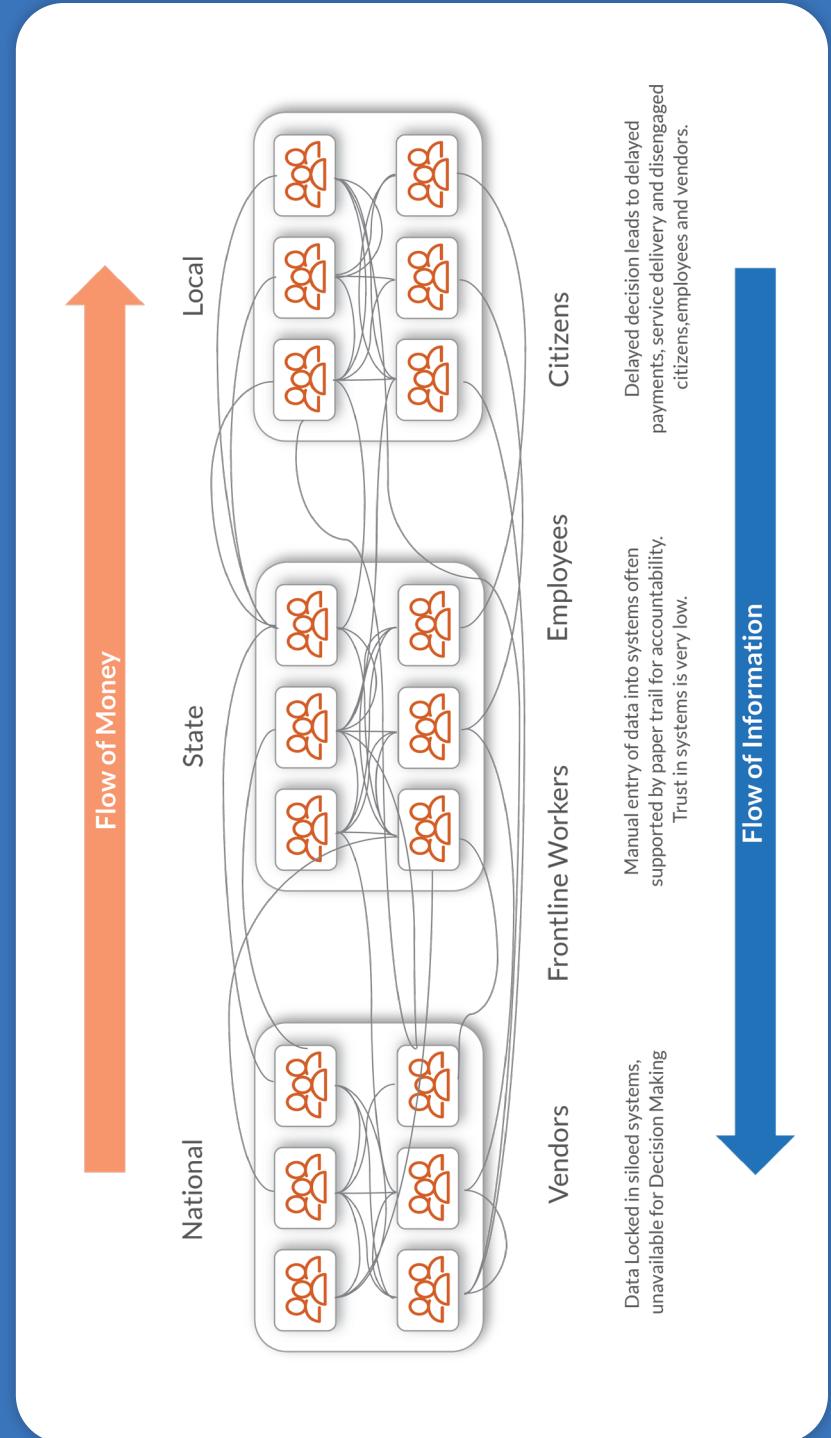


Figure 4



# 04

## Reimagining Fiscal Information Flow

### Digital Information Flow: Generating Real-Time Transactional (RTT) Data

In a world where records are kept on paper, the smooth flow of information would depend upon the movement of pieces of paper from one desk to another. This requires both human effort and time, which act as binding constraints upon information flow or availability.

Digitisation releases both these constraints. If the systems used by two or more entities are connected to the internet and interoperable, then data that is entered in any one system can be available in another system automatically and at some defined frequency, up to and including in real time.

*Digital information flows will ideally be designed and implemented as follows:*

- Data is either natively captured in digital form – also known as REAL-TIME TRANSACTIONAL (RTT) data – or digitised as close to source as possible<sup>19</sup>.
- This digitised data is recorded in a standard format, which ensures that it will mean the same thing to every system or viewer.
- Access to this data is limited to systems or users with the required authorisation (e.g. with the appropriate login credentials).
- This data is shared with other systems, either at some predefined time interval, or in response to queries (from an authorised system or user).
  - » Such sharing may be of the entire dataset, of specific fields, or of derived data (aggregates, analytics, etc.) based on users' mandates & needs.
  - » Where the data includes any personally identifiable information (PII) of an individual, this can be shared only in keeping with relevant laws governing individual privacy and data-sharing – e.g., it may be shared if the individual is notified of consents to such sharing.

<sup>19</sup>Both in terms of time, and how many sets of hands or eyes it goes through before being digitised. Data is a record of an event; the further removed the data from the event, the lower its quality / integrity / reliability.

## Digital Information Flow for PFM: Linking Fiscal & Service Events

As noted above, government entities raise and spend money as part of various missions, schemes, projects etc. that aim to create public goods, deliver public services, or deliver public welfare.

- Every activity undertaken as part of such mission / scheme / project is done by a specific entity, which receives funds for that purpose.
- We can think of these activities as operational events, and the systems used by the implementing agencies as operational systems.

The PFM lifecycle, which runs in parallel to these operational activities, records how funds are requested, collected, allocated, and expended – as well as how they are accounted for, and how such accounts are audited / verified.

- Every such movement or record of funds ultimately reflects in the systems of funding agencies, which we can think of as fiscal systems.
- The interaction between fiscal and operational systems can be modeled as a series of fiscal events.

The key to reimagining PFM by leveraging digital public infrastructure is to create a standardised, observable, and non-repudiable record of fiscal events, linked to their corresponding operational events. In turn, this requires two innovations: a set of standardised fiscal events, and a data exchange mechanism that enables different systems to create, read, and modify / update such fiscal events.

The Digital PFM system, with its standardised events and data exchange mechanism, can interact with a wide range of implementing agency / line department systems. These systems can also be set up to emit events, which in their case would be operational or service events<sup>20</sup>. Each fiscal event will thus be linked to one or more service event(s).

While service events may be more varied in nature, and hence more difficult to standardise at a single / national level, it should be possible to standardise them at the level of a given department or government body, as the set of processes done, duties performed, and services delivered by that implementing entity are clearly defined.

<sup>20</sup>A service event can be thought of as a defined milestone in any given workflow. For instance, if the service being sought is a license or permission, then service events can include creation of an application, submission of documents, verification of documents, and issue of the license. The first three will link to a fiscal event chain (demand for fees -

### Streamlining flow of information using a digital PFM platform

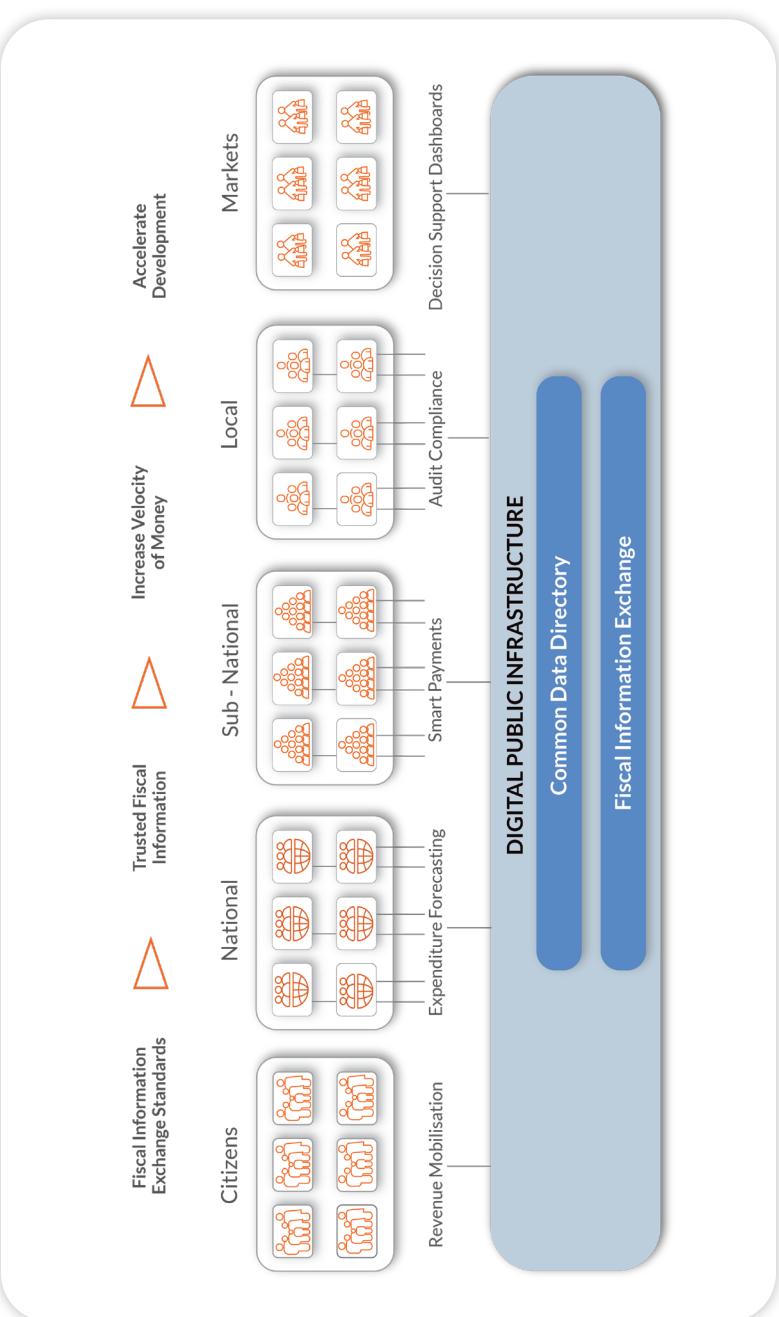


Figure 5

receipt of fees - credit of fees), which in turn will link to the approval / issue of the license. When the license is up for renewal, the process can start from the fiscal event side – with a demand for renewal fee – and again lead to either re-verification or direct renewal.

*Streamlining flow of information -  
fiscal and operational systems exchanging standardised events*

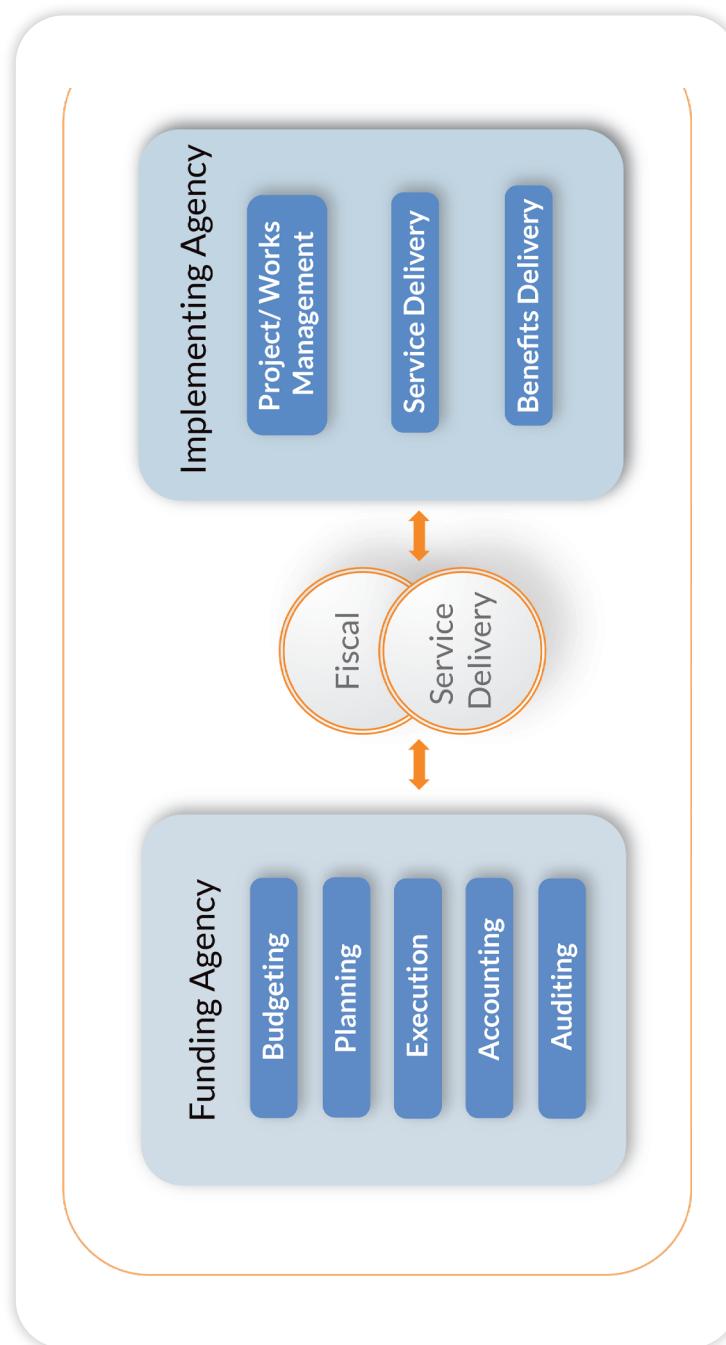


Figure 6

## Standardised Fiscal Events

Table 3: Definitions of Standardised Fiscal Events

Fiscal Event	Definition
Plan	Event containing a detailed view regarding how revenue will be raised or expenditure will be carried out, sources of funds, intended outputs etc.
Estimate	Event containing a high-level view regarding what amount of receipts or expenditure are expected. A collection of estimates is a proposed budget; in a top-down budgeting system like India's, the estimate cannot exceed the budget ceiling specified for that particular entity.
Sanction	Event containing a permission to incur expenditure up to a specified amount. The sum total of sanctions or allotments would add up to the budget (i.e. total estimates) for that entity; this event helps control the rate of expenditure of funds, by separating the total budgeted / committed amount into tranches.
Demand	Event containing a request for transfer or payment of money to a government entity. Such request could be made to a private entity (e.g. to pay taxes or fees) or to another government entity (e.g. to transfer a tranche of committed funds.)
Bill	Event containing a request for transfer or payment of money by a government entity. Such request could be made by a private entity (e.g. a vendor seeking their dues, an employee seeking salary) or by another government entity (e.g. an implementing agency seeking the next tranche of committed funds.)
Receipt	Event resulting in fiscal information containing banking transaction initiation details for any fund transferred to the government.
Payment	Event resulting in fiscal information containing banking transaction initiation details for any fund transferred by the government.
Credit	Event resulting in fiscal information containing banking transaction completion details for any fund transferred to the government.
Debit	Event resulting in fiscal information containing banking transaction completion details for any fund transferred by the government.

The fiscal events can thus be grouped into three categories:

- Budget-related events: Plan, Estimate, and Sanction are largely involved in the budget preparation and budget approval process, with much of the work being done before the start of the financial year. That said, new plans and/or estimates may be created at any time: as new information or needs emerge, or in the case of schemes where project selection / finalisation is a periodic process, or even due to delays / incomplete information at the start of the financial year. Sanctions are likely to be issued over the course of the financial year, as allocated funds are released in tranches, typically conditional on usage of a previous tranche.
- Revenue-related events: Demand, Receipt, and Credit are revenue-side events, representing different stages in a transaction wherein the government receives moneys, whether from another government entity or a private entity. The transaction is initiated with a demand event, official receipt of moneys is marked as a receipt event, and bank confirmation of receipt of moneys is a credit event.
- Expenditure-related events: Bill, Payment, and Debit are expenditure-side events, representing different stages in a transaction wherein the government spends moneys – including on salaries, pensions, procurement, direct benefits transfers, etc. The transaction is initiated with a bill event, official disbursement of moneys is marked as a payment event, and bank confirmation of transfer of moneys is a debit event.

Broadly speaking, the completion of the budget-side events should lead to initiation of service delivery by the implementing entity, as these will signify that moneys have been allocated for use on a particular project or regular operations, and that expenses upto the sanctioned amount can be incurred by the implementing entity.

As that project or operation unfolds over the year, the corresponding expenditure-side and revenue-side transactions will occur, resulting in demand-receipt-credit or bill-payment-debit event chains for each such transaction. These will be linked to one or more service events, as per the process of that specific implementing agency's workflows.

Note that, as bank transfers sometimes experience failures, the ability to compare receipt-credit and payment-debit events is important. It may become necessary for the payer to re-initiate the transaction if it is found that the credit or debit has failed<sup>21</sup>.

Each fiscal event can be defined such that it includes certain minimum details, also known as fields or attributes.

<sup>21</sup>This can be addressed by including success / failure status as an attribute of credit and debit events – see below the description of event attributes. In general, banking systems (including government banking systems, with banks such as RBI and SBI) have also developed reports to identify and reconcile failures in attempted receipts or payments.

## Draft Fiscal Event Structure

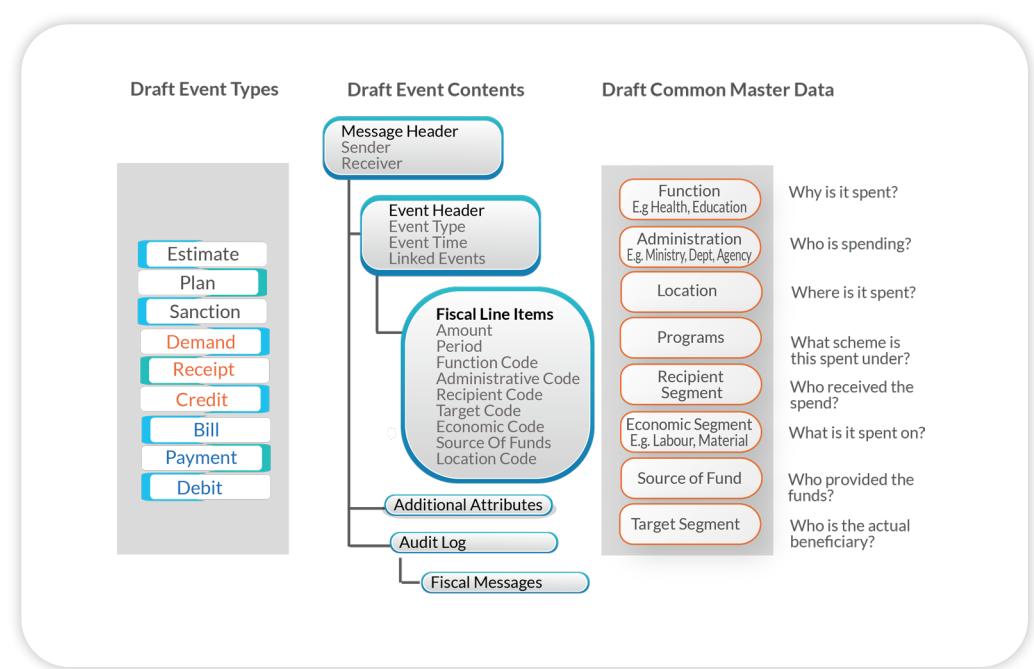


Figure 7

### Broadly speaking, every event would include the following attributes:

- The entity (department, official) that was creating it
- The entity (department, official) responsible for approving or verifying it; or, the entity to which it was being sent (e.g. for reporting or coordination)
- The source of funds associated with it (specific scheme, department budget, etc.)
- The amount of funds associated with it
- Whether it is a receipt<sup>22</sup>, debt, or expenditure, including whether it is a capital expenditure (leading to creation of an asset) or a revenue expenditure.
- Whether is provisional, approved, or verified / audited; in the latter cases, the event trail would also reveal who approved / verified / audited it.
- The specific heads of accounts associated with it, as per existing accounting codes.

<sup>22</sup>This refers to any inflow of funds. Not be confused with the "receipt" fiscal event.

Once the PFM lifecycle is reimagined in terms of the following fiscal events, it becomes possible to link multiple systems at multiple levels of government by exchanging fiscal events. Each fiscal event can further be associated with one or more service events (sourced from the implementing agency's systems, i.e. the systems being used to manage service delivery). These service events indicate the specific set of inputs, activities, and outputs on which those funds are to be or were expended.

- Since fiscal events are standardised, the same minimum information must be included each time they are created or shared.
- Irrespective of the source office or system, this information will thus be available in real time or near-real-time to all authorised viewers.
- This improves reliability (i.e. quality and completeness) of data, makes data available in a timely and regular manner, and reduces costs of coordination.
- The linkage between fiscal and service events gives visibility into the entire chain of public goods / services / welfare delivery, starting from planning and estimation, through budget approval and budget execution.
- The availability of change / approval logs in the fiscal event makes clear who raised, approved, and verified any given revenue or expenditure. Where such logs are also available for service events, it enables detailed correlation of inputs, activities, and outputs with specific expenditures, across the lifecycle of a particular project.

## Fiscal Data Exchange: The iFIX Platform and Adapters

In the previous sections, we have looked at the pivotal problem of information flow, and how this might be addressed through standardised events. While standardised events will ensure that multiple systems or entities are speaking in a manner intelligible to each other / everyone, there is still the technical question of how they are to speak with each other, i.e. the mode of connection or interoperability.

If this is done through point-to-point integration, it will be very time-consuming and expensive. Instead, interoperability can be achieved through a PLATFORM: the integrated financial information exchange (iFIX).

### iFIX Platform - Streamlining flow of information

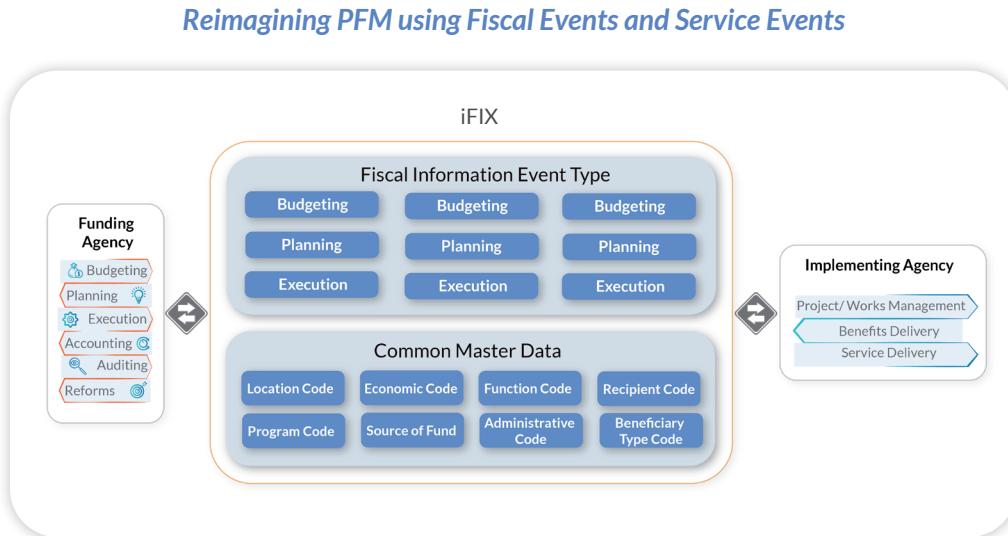


Figure 8

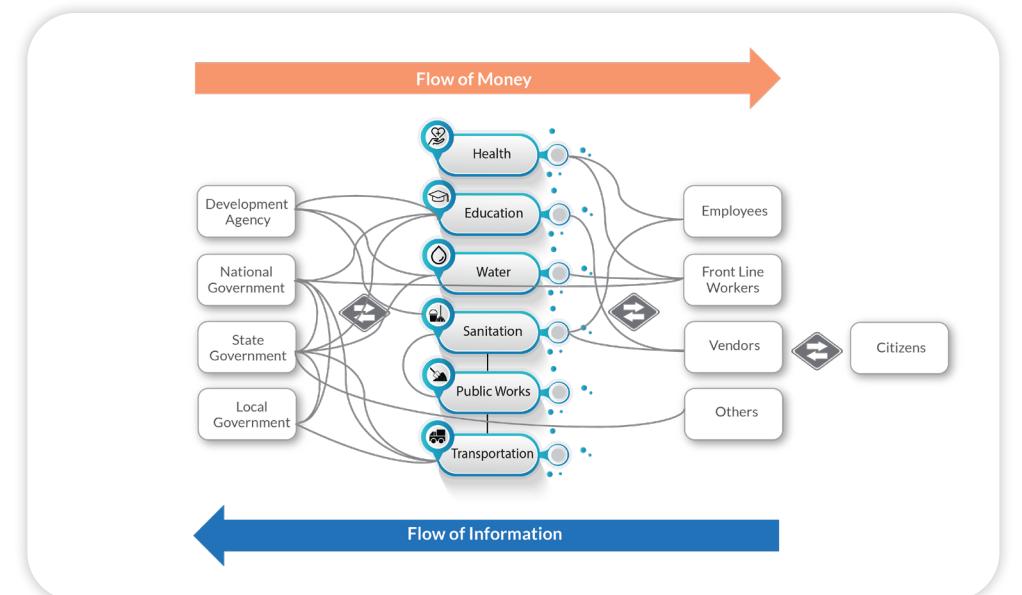


Figure 9A - iFIX Platform streamlining flow of information (Before)

## Two models of integration - iFIX Platform & iFIX Adapters

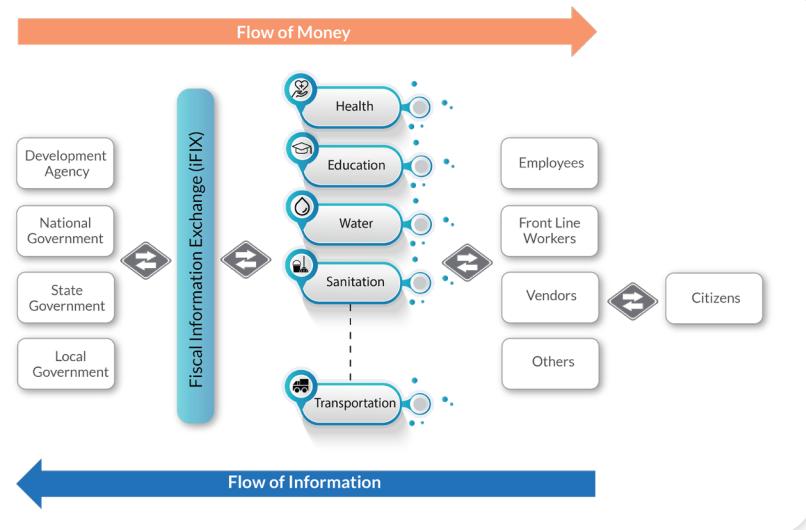


Figure 9B - iFIX Platform streamlining flow of information (After)

The iFIX PLATFORM solves the problem of point-to-point integration between multiple systems by providing a common set of master data (also known as registries), standardised fiscal events, and APIs.

- The registries / common master data serve as a single source of shared information for all entities accessing the platform. This addresses many of the challenges with non-standard use of terminology, codes, etc.
  - » Such registries are subject to well-defined principles of data storage and access, depicted in the image below.
  - » Each registry is also subject to its own governance, with a mandated owner, who ensures it is suitably maintained.
- Each system can use well-defined APIs to post information (new fiscal events, updates to fiscal events) to and read information from these registries.
- New and updated systems can be built to incorporate the standard fiscal events and APIs, enabling them to speak with the iFIX PLATFORM directly.
- Legacy systems can still speak with the iFIX platform – and through it, with each other – through an interface that translates that system's data into the format of fiscal events. This interface is known as an ADAPTER.

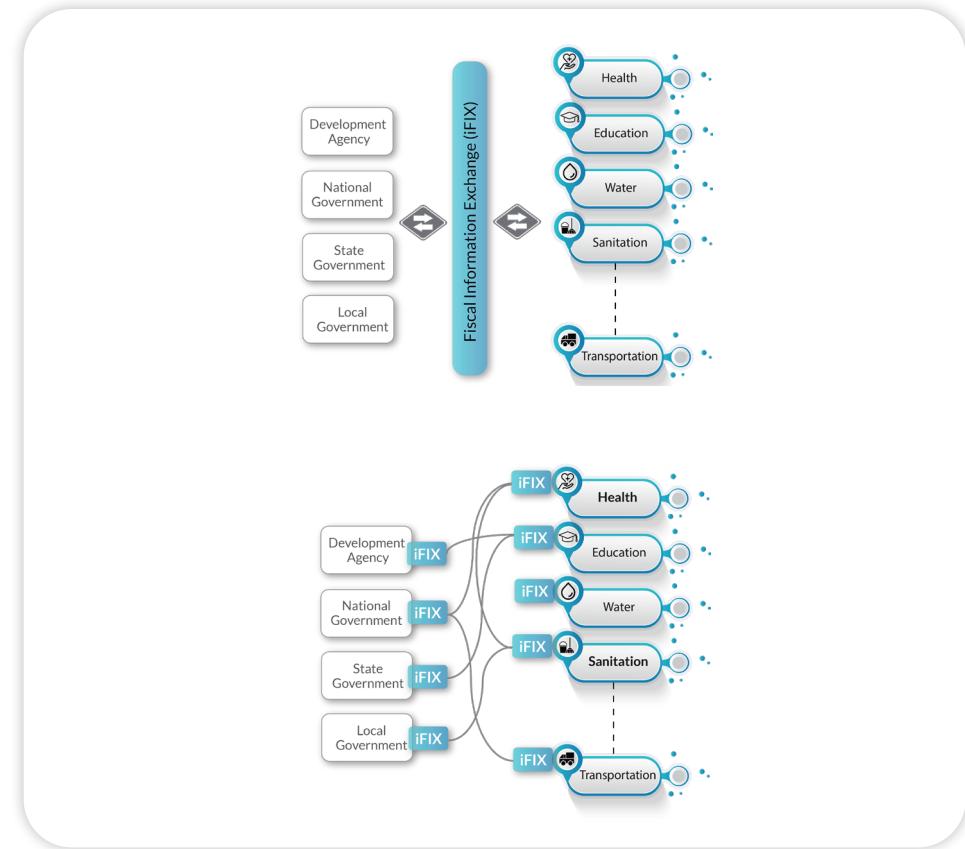


Figure 10 - Two models of integration - iFIX Platform & iFIX Adapters

- The iFIX PLATFORM will also enable various ANALYTICS to be built on top of the platform and the data recorded in it (as fiscal events); these analytics can similarly be accessed by systems plugging into the platform.
- The ability to post or read any information, whether fiscal events or analytics, will be subject to appropriate authorisation (i.e., an entity must have the mandate or authority, and the specific user must have the right credentials) – what some call the “trust and consent layer” of government-as-a-platform.

The iFIX PLATFORM and ADAPTERS, built to exchange standardised FISCAL EVENTS, enables us to reimagine and transform multiple aspects of PFM, as detailed in the following section.

<sup>23</sup>Loosemore (2018), “Making Government as a Platform Real”, Public Digital.

*iFIX supplementing coordination and visibility within and across federal tiers*

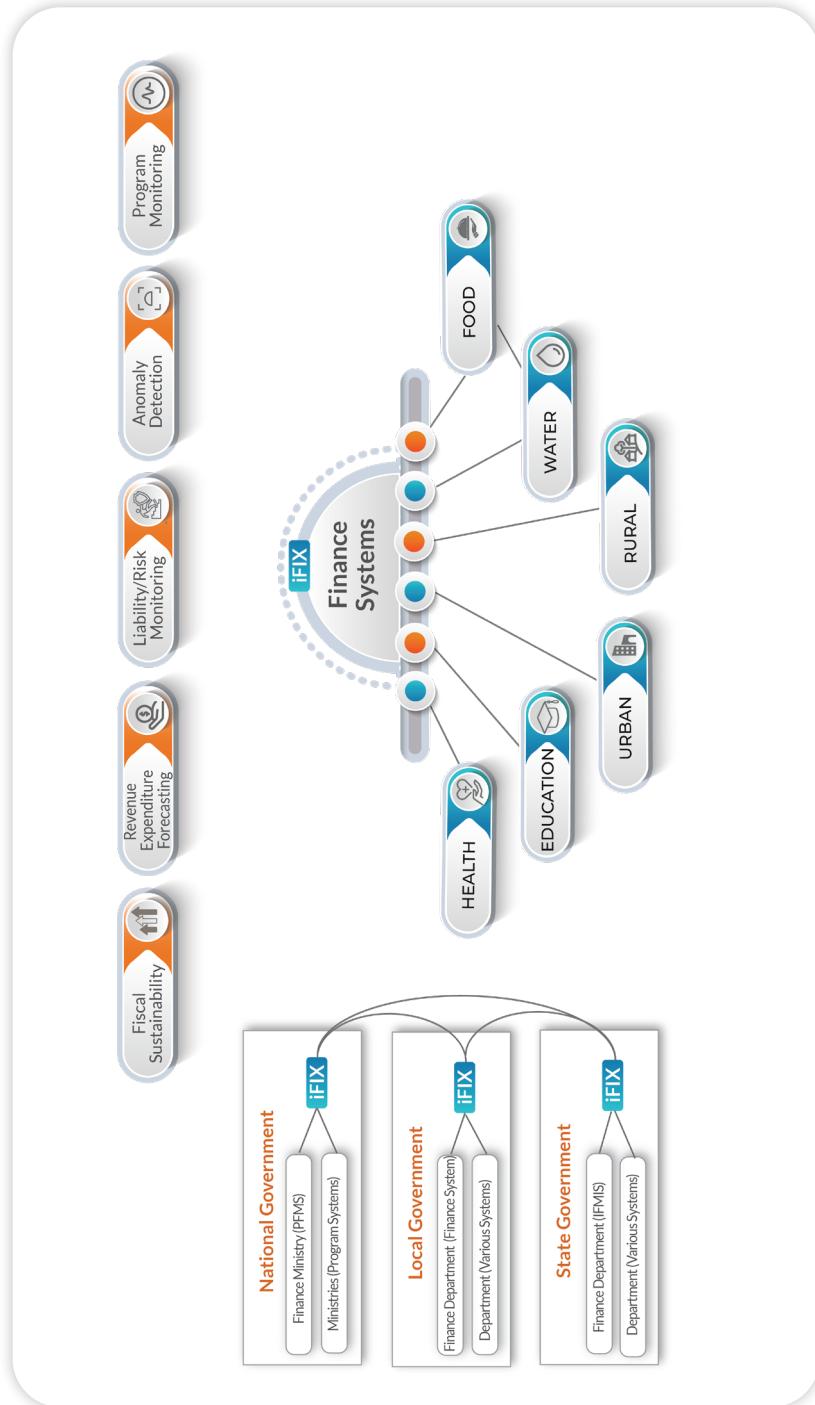


Figure 11 - iFIX supplementing coordination and visibility within and across federal tiers

## iFIX Platform Design Principles

iFIX is an example of Digital Public Infrastructure (DPI)<sup>24</sup>. Moving away from creating individual or even integrated applications, it aims to create a minimal shared infrastructure that others can build upon to meet their various contexts & needs.

As a DPI, iFIX is created in accordance with certain key DESIGN PRINCIPLES<sup>25</sup>:

- **Inclusivity:** channel-agnostic; capable of supporting multi-modal and multi-lingual communication.
- **Interoperability:** enhancing ease of integration and information-sharing, reducing costs of coordination between systems or entities.
- **Minimalism:** platforms offer core, minimal functionalities, which are easy to extend and scale.
- **Open & Standards-Driven:** open by design, using standards to enable interoperability and prevent vendor lock-in.
- **Transparency / Traceability:** developed to be observable in deployment / administration, with auditable logs (that cannot be edited).
- **Unbundling:** developed as building blocks, which can be reused, scaled, and evolved independently.

In keeping with the principles of Ease of Use, Minimalism, Scalability, and Unbundling, the iFIX platform is envisioned as being:

- **Customisable:** Multiple entities can have their own instances of the platform, where they can configure their processes & manage their data.
- **Extensible:** Multiple entities can develop additional features, functionalities, applications, use cases etc. to meet their specific needs.
- **Reusable:** Building blocks and data can be used by multiple entities in parallel, enabling

<sup>24</sup>"... solutions and systems that enable the effective provision of essential society-wide functions and services in the public and private sectors. "<https://digitalpublicgoods.net/blog/unpacking-concepts-definitions-digital-public-infrastructure-building-blocks-and-their-relation-to-digital-public-goods/>

<sup>25</sup>For a full list, see <https://core.digit.org/platform/principles>



# 05

## What iFIX Enables

### Real-Time Visibility Into Fund Flows

When multiple mission, scheme, and department systems begin posting fiscal events to iFIX, the most immediate benefit is that any authorised viewer can see the status of funds within these multiple systems.

*Since this information is included in the fiscal events, viewers should be able to see:*

- The total amount of funds available to any given entity
- The sources of these funds
- Whether these funds are:
  - » currently in that entity's bank accounts
  - » in another entity's bank accounts, and committed to be transferred
    - ◊ under certain conditions
    - ◊ at some specific point of time
  - » projected to be collected, with this projection subject to realisation
- What projects the entity had or has proposes to spend these funds on
  - » Specific outputs (public goods, public services, direct benefits) associated with these expenditures
  - » Whether a given expenditure is a capital or operating expenditure
  - » Whether a given expenditure is planned / estimated or ad hoc / unplanned
  - » Whether a given expenditure is committed or still to be approved
    - ◊ If the latter, who is to approve it, and what conditions are to be fulfilled for such approval
  - » The current status of this project
    - ◊ Is it running on time or delayed
    - ◊ Have milestones been met on budget, or have there been any overruns / discrepancies

- What funds have already been spent as of the current date
  - » What projects these funds were spent on (budget heads, line items)
  - » What outputs these expenditures have created
    - ◊ Whether these outputs were created on budget, or there were overruns / discrepancies
    - ◊ Whether these outputs were created on time, or there were delays
  - » Whether these were planned / estimated expenditures or ad hoc
  - » The entire chain of events and officials involved with planning, estimating, approving, and expending these funds, including those who recorded or approved any interim milestones
  - » The entities to whom these funds were paid
    - ◊ Whether these entities have received any other payments
      - From the same entity, for other projects
      - From other government entities
      - The status of such other projects
- Approval / verification and audit status of any given expenditure

This is the kind of visibility that a given Scheme MIS or a given department's works management and accounting systems may provide; however, it is now available for all government entities across the board, creating comprehensive and real-time visibility into all fund flows and project status across the State. The availability of this information immediately addresses some of the challenges observed currently.

- The utilisation certificate (UC) can be transformed into much more flexible and specific controls, as both expenditure and project status are visible.
  - » Tranches of funding can be modified or fine-tuned based on the requirements of a given project.
  - » The relevant entity can request tranches on a modified timeline, and justify any such request with information on project status.
  - » Release of tranches can even be automated, once completion of a specific milestone has been verified; these can be milestones related to completion of works and/or completeness of accounts, not only expenditure of money, enabling better control and scrutiny.
- The exact amount of idle balances will be visible, and those funds may be reallocated based on the priorities of the administration.
  - » Guidelines can be formulated around who is authorised to carry out such reallocation, and under what circumstances.
  - » This exercise can be optimised to reduce government borrowings, with the aim of bringing down the fiscal deficit / interest burden that the State government has to bear.

## Revenue Mobilisation



If one leaves aside grants / transfers, government bodies rely on taxes, fees, and proceeds from privatisation / disinvestment of government-owned assets for their revenue. Taxes and fees are the main recurring income sources, and finding ways to mobilise revenues from these sources can enhance the funds available with the relevant government entity to finance its expenditures independently, with lesser reliance on grants.

Any tax revenue is broadly the product of three factors: coverage, collection / realisation, and valuation. Coverage ratio refers to the share of all taxable entities who are in fact in government records, and hence being delivered a demand for taxes. Collection ratio refers to the share of revenue being realised as a proportion of total demand raised. Valuation refers to the determination of tax rates and methods; where taxes are charged ad valorem (as a percentage of the value of a given asset), valuation includes the methods of determining the value of the asset being taxed.

The ESTIMATE fiscal event can be used to set targets for revenue mobilisation by a given government entity in a given financial year; this can be compared to total receipts / total credits to assess achievement of the target. Comparing target achievement across departments and geographic units can help identify key focus areas for reforms and/or enhanced enforcement. This would potentially enhance the collection ratio.

Beyond simply setting and tracking targets, the creation of shared data registries carries great potential for expanding coverage. Entities such as properties or companies show up in multiple contexts: property / vacant land taxes, water connections, sewage connections, power connections, building plan / building modification approvals, trade licences, public safety certificates (e.g. fire department NOC, food safety inspection), labour law permits and compliances, registration of leases or tenancy, etc.

Comparing such registries will help identify missing entries, which can then be brought into the ambit of the relevant tax or fee, improving the coverage ratio. Where these are combined with additional information sources – e.g. property value ready reckoners – they can also become an input for more accurate valuation.

Fees are generally paid by persons seeking some license or permission, or availing of some service, from the relevant government entity. Here, the notion of coverage expansion may be relatively limited, as this is generally an applicant-initiated activity. That said, broadcasting revenue-side fiscal events (demand - receipt - credit) from the relevant operational system will bring greater transparency to these revenue streams, enabling real-time monitoring, as well as trend analysis and comparison of different departments and geographic units. This can help identify over- and under-performers, to identify and replicate good practices from the former, and address any specific challenges faced by the latter.

It is worth noting that coordinating across departments can also significantly enhance the experience of citizens who interact with these various entities. For instance, a unified front-end that reflects the status / validity period, pending renewals, and all taxes and fees due against a particular property or business will simplify the process of compliance and payments for the property / business owner. This brings greater predictability to the operations and cash flow of both, the government entity and the property / business owner, and reduces the likelihood of non-payment simply because a bill was missed or could not be delivered.

## Forecasting and Liability Management

The nature of budget preparation, budget execution, and public procurement in India today is such that estimates and actual revenues or expenditures can vary significantly. This leads to a range of avoidable problems, including disrupted payment and work schedules, delays, cost variations, 'shock bills'<sup>26</sup>, skipping of maintenance or repair works (which lead to larger costs in the future), etc.

While recent digital PFM reforms (see section 1d) have brought greater visibility into the status of allocated funds (grants), and hence reduced the likelihood of unused funds being parked in implementing entity accounts, grants are only one source of revenue; without good visibility into revenues and expenditures as well, this provides only a slice of the overall picture of fiscal health of the government.

When integrated with service / operational systems that log expenditures, the iFIX platform can provide real-time visibility into all aspects of fiscal management. Own revenues can be collated across departments and geographic units; this can be overlaid with the logged and/or projected expenses for those units, revealing where surpluses and shortfalls are likely to arise.

For instance, in Punjab, the Department of Water Supply and Sanitation faced a lack of visibility into the operations & maintenance expenses – most notably on electricity – incurred by village water committees<sup>27</sup>, as well as the revenues collected by these bodies<sup>28</sup>. This manifested in fiscal shocks towards the end of the fiscal year, in the form of substantial unpaid bills forwarded to the Department by the electricity distribution company.

<sup>26</sup>We use this term to refer to large unanticipated liabilities. These are often not unanticipated in principle – i.e. the funding entity knows that certain expenses are being incurred by an implementing entity, and that it is liable to pay for those in case the implementing entities own revenues cannot cover it. Without a reliable forecast of both expenditures and revenues, however, the funding entity is unable to project what this liability will actually turn out to be.

<sup>27</sup>The Gram Panchayat Water and Sewerage Committee (GPWSC), also known as the pani panchayat, is a local body that includes Gram Panchayat members, as well as other members, and is responsible for the operation and upkeep of drinking water and sanitation-related assets, such as water towers. The construction of these assets is funded through schemes such as the Jal Jeevan Mission, and the GPWSC becomes responsible for the asset thus created.

<sup>28</sup>Punjab currently follows a per-household flat fee model for water; however, revenue logging would be relevant even in the case of metered connections. Households may also have a mix of connections (e.g. village water supply as well as their own wells), and there may be communal water points not linked to a specific household, so the mapping of consumptions / fees / revenue to individual households is not straightforward.

## Bottom-up and Participatory Budgeting

The department has now rolled out a revenue and expense logging application to all villages in the state. Designated operators from the village water committee record the expenses incurred, such as on electricity, maintenance, wages of pump operators etc. Similarly, bill collectors – who go door to door to collect the water fees – create a real-time record of payments received from households. These inputs are collated through the iFIX platform, and displayed as a real-time dashboard of financial sustainability (or liabilities) for each village. iFIX is also integrating with the electricity distribution company systems, enabling them to directly and automatically push billing / consumption information to the villages and the department simultaneously. This serves as a check on misreporting or non-reporting from the village level, and enables closer coordination between the water and power departments.

### *Creating visibility into fiscal sustainability and liabilities, enabling co-ordination and improved forecasting - mGramseva Punjab & iFIX*

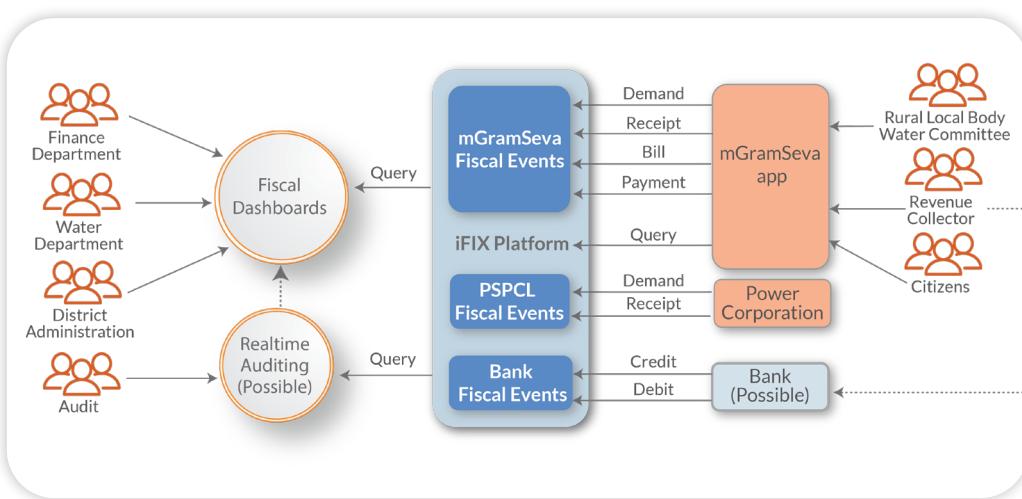


Figure 12

There is thus a triangulated and verified, real-time view of fiscal health of villages with respect to this specific scheme. This can be potentially expanded to multiple schemes and departments, building an increasingly comprehensive view of overall fiscal health, and reducing the likelihood of other ‘shock bills’ from expenditures that existing tracking mechanisms may have missed.

Further, building on these multiple data streams, it is possible to build forecasting models, which use actual reported revenue and expenditures to correct the estimates presented at the start of the year – which, as we have seen above, are often incremental in nature rather than representing a true bottom-up estimate. This can be combined with incentives for entities that present accurate estimates, and with transfer of knowledge and good practices from those who have been able to conduct effective estimation to their peers.

In a federal system, it is desirable for planning to be decentralised. Ideally, even as funding agencies may define ceilings or limits for expenditures, planning should involve line departments projecting their bill of work and estimating the costs associated with this work; this information can be aggregated across departments and geographic units to develop a bill of work and budget at the state level.

While many missions and schemes in India do have a mandate to engage in participatory planning, the track record remains mixed. Many entities still default to INCREMENTAL PLANNING – making small adjustments on previous years’ estimates – which creates a risk that proposed works and fund amounts may turn out to be either insufficient or excessive.

- The logical order of planning and estimation is reversed: estimation comes first, and plans are retrofitted to the projected expenditure.
- Time and/or cost overruns become more likely.
- Some proposed work may turn out to be unnecessary or infeasible.

Today, the planning process rarely analyses and builds on evidence from previous efforts to deliver those public goods, services, or welfare to develop better estimates. As a result, it is difficult to say what improvement in access to public goods, services, or benefits a particular outlay is expected to achieve. Long-term plans (going beyond a given budget cycle) are difficult to track.

iFIX has the potential to address these flaws by providing better information to all stakeholders – line departments, local administrators, local elected representatives, citizens’ groups, and civic-minded individuals – to drive planning and estimation. When a given department uses iFIX to record its expenditures and associated outputs in a given financial year, it becomes possible for that information to be compiled, analysed, and shared with the relevant stakeholders.

- Using this as an input to the planning process, these stakeholders can then determine whether there are specific changes they wish to make to the overall plan for the subsequent financial year.
- The data from the reported year, which includes actual expenses incurred and the status of work or service delivery undertaken, can provide a point of reference or benchmark for deriving estimates for the subsequent year.

- Where there are incomplete or pending items from the reported year, these can be factored into the plan for the subsequent year
  - » If there were specific reasons that these projects remained incomplete, and the same conditions still prevail, these can be understood as risks to completion in the subsequent year as well.
  - » An informed decision can be taken on whether a new plan or approach is needed in light of such constraints.
- When submitting the PLAN and ESTIMATE events, the line department can make reference to specific data points from the previous year used in coming up with those estimates, thus making a stronger case for the allocation they seek, and providing greater context for the budgetary debate.
- During the BUDGETING phase, the legislature can engage in more data-driven and detailed discussion of the proposed works / expenditures, and try to project the impact of any changes on the proposed outputs at the local or even state-wide level. They can also identify synergies and opportunities for streamlining planning & expenditures across departments.

## Smart Contracting and Payment Automation

As noted above, one of the most high-friction areas related to PFM is that of government procurement and contracting, and more specifically of timely payment of vendors. In the absence of timely payment to vendors who deliver as per contract, “good” vendors tend to exit the government contracting business altogether.

One possible answer to this challenge is to create digitally-enabled ‘smart contracts’: agreements that are self-executing upon the fulfillment of certain conditions, wherein the payment to the vendor will be automatically executed, with no additional human intervention required in order for it to be processed.

These conditions would typically be certain milestones in the execution process, which are specified in the contract itself – in other words, specific service events. The status of contract execution and attainment of any particular milestone would already be monitored and reported in that operational system; for instance, in a public works contract, the public works department of the relevant jurisdiction would be monitoring and reporting on the status / progress of the project.

Smart contracting thus reduces the administrative load borne by finance and accounting systems over and above that borne by the works management system, by automating the process of payment / fund disbursal once the latter has certified that implementation has progressed to the required level.

***To be sure, there may be concerns around removing existing scrutiny or discretion around payments.***

- On the one hand, these could be addressed by piloting smart contracts with a limited set of government entities and vendors, and establishing prerequisites before either party can qualify for this mechanism.
- On the other hand, a “bill” or “payment” event would arise only after multiple prior checks – i.e. a smart contract would pertain only to projects that had passed multiple layers of scrutiny during plan and estimate stages, and the funds in question would be sanctioned at the time the bill was raised.

## Real-Time Accounting and Auditing

As noted above, the stages of the PFM life cycle where the maximum effort and time are spent on requesting, collecting, collating, and reconciling information are accounting and auditing. The lack of a common platform and standardised information is addressed through such painstaking efforts in these stages.

iFIX simplifies both accounting and audit, by making all relevant information available, searchable, and traceable. A significant portion of the effort associated with accounting can in fact be automated, by integrating the operational systems of line departments (e.g. works management), their finance and account systems, and overall Union and State government treasury / fiscal systems. An auditor can define a sample of events to study, look up all relevant information, and verify that records have been created in compliance with the relevant guidelines.

- Over time, as these guidelines get built into the specifications of fiscal events and the protocols through which different systems interact with each other, the frequency of such deviations will also be reduced.
- This is also an improvement in ease of working for the line department employee, as many of the specific details related to compliance with relevant guidelines are now being taken care of by the system, reducing the burden of compliance on the individual employee / user.



The creation of new fiscal events, updates to existing fiscal events, and deletion of any fiscal events in the iFIX registries are done through APIs. This means that they can only be done by an authorised user, and that each such action is itself recorded in an auditable log.

This means that if an auditor notices a discrepancy or any deviation from the guidelines at a given stage in any record or transaction, they can identify the specific users associated with that stage / change, as well as the exact time at which this change was recorded, making tracing and clarifications simple.

## Output and Outcome Budgets and Tracking

One of the most transformative possibilities unlocked by the combination of standardised fiscal events and the iFIX platform is the ability to link any specific expenditure to the outputs (and, by implication, the outcomes) proposed or intended to be achieved by that expenditure.

This will enable more detailed, data-driven planning and decision-making; enable monitoring, assessment, and comparison of multiple schemes and initiatives; which in turn enables further optimisation of expenditures and scheme design using cost-effectiveness data.

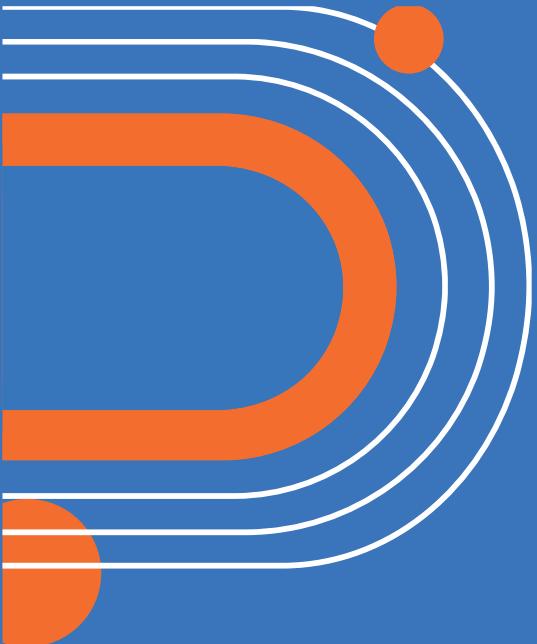
This is made possible by the continuity between detailed planning in the budget formulation stage, operational systems in the budget execution stage, and bill or payment events in the execution and accounting stages. More specifically, since each proposed expenditure is linked to intended outputs and outcomes (defined in the PLAN and ESTIMATE fiscal events), it becomes possible to look at such expenditure at any stage and ask what outputs or outcomes are projected to be created by it.

Output and outcome budgets consolidate answers to this question across multiple related expenditures — for instance, all such expenditures related to a certain project, a certain entity within government, or a certain mission or scheme. This helps policymakers and the public understand if the intended outputs and outcomes were created by those expenditures.

If they were not, then it becomes possible to conduct more detailed analysis, and to propose alternative approaches to such work in the future. Looking at output and outcome data across a wide range of projects and entities can also enable the creation of ranking / rating systems, as well as identifying and disseminating good practices and lessons learned.

A related possibility is improving targeting of social welfare programs, where – provided the groups such a program is intended to reach are defined at the PLAN stage – an assessment of outputs / outcomes can ask whether the intended benefits in fact reached the intended recipients.

While this may require additional research or methodological innovations, the data recorded in iFIX and operational systems will form a sound basis for such research or evaluation, and enable more precise recommendations on how such programs may be improved. The entire budgeting process,



# 06

## Operationalising the Reimagination



Transforming PFM in India by leveraging iFIX and standardised fiscal events requires collaboration across multiple levels of government. Some key stakeholders are:

Level / category	Stakeholders
Union Government (Executive)	Finance Ministry; Line Ministries / Departments
State Governments	Finance Departments; Line Departments; Parastatal organisations; State Legislatures
Constitutional Bodies	CAG; CGA Finance Commission; State Finance Commissions
Local Governments (ULBs, PRIs)	Finance Departments; Line Departments; Local Elected Representatives
Others	Banks; Vendors to Government; Software Vendors to Government; SIs; Researchers & Academic Institutions

The iFIX journey can be broken down into certain key milestones. The various stakeholders can thus work in parallel to achieve these milestones in their own jurisdictions / areas of responsibility.

- Adoption of standardised fiscal events
- Adoption of iFIX platform or adapters for one department / mission / scheme / set of missions & schemes ("exemplar")
- Adoption of iFIX platform as primary / sole mode of communication between Finance Ministry / Department and line departments / implementing agencies
- Leveraging iFIX platform to automate generation of Utilisation Certificates
- Adoption of iFIX platform for accounting & auditing, leading to publication of provisional and audited accounts
- Creation and testing of additional use cases (e.g. smart contracting, applications for participatory planning, etc.)
- Use of iFIX reports / data and analytics for planning & estimation
- Use of iFIX reports / data and analytics for credit rating
- Use of iFIX reports / data and analytics for research & innovation

## Role of Union Government

The Union Finance Ministry will play a key role in institutionalising the fiscal event standards and the iFIX platform, and in supporting and incentivising both Union and State Government stakeholders to adopt the standards and platform.

- The Finance Ministry can endorse the fiscal event specifications, leading to its further development and adoption as a standard
- Experts at the Finance Ministry can help further develop the standardised fiscal events and adapters to ensure interoperability across multiple tiers of government, for instance, by using standardised fiscal events as a means for harmonising accounting methods used at the union and state level (LMMHA) and at the local government level (NMAM, PRIASoft, other state manuals).
- The Finance Ministry can host a central instance of the iFIX platform, and assist other union and state government entities wishing to either onboard (become tenants on) this instance or create their own instances.
- Over time, the Finance Ministry can begin requiring reporting of information using the fiscal events standards, with additional incentives for reporting through the iFIX platform / adapters. This implies that the data is shared through APIs, rather than manually-created spreadsheets or documents.
  - » When presenting the annual budget, the Finance Minister can name and acknowledge adopters of the platform, and highlight the improvements in timeliness and integrity of data they shared.
  - » Over time, the Finance Ministry can raise the borrowings ceilings for states that have adopted the fiscal events standards and iFIX platform / adapters, and are sharing real-time transactional data leveraging these capabilities.
- The Finance Ministry can support local governments that have adopted the fiscal events standards and iFIX platform / adapters, and want to undertake a credit rating exercise leveraging data from the platform.
- The Finance Ministry (and related offices, such as the Chief Economic Advisor) can collaborate with researchers and academic institutions to use data from the iFIX platform to conduct research, including in flagship publications such as the Economic Survey.

Similarly, various Ministries and Departments within the union government can adopt the fiscal event standards and iFIX platform / adapters for the funds, missions, and schemes within their jurisdiction.

- They can require entities receiving funds under specific missions / schemes to report data using the iFIX platform / adapters. This implies that the data is shared through APIs, not in manually-created spreadsheets or documents.
- They can use periodic publications to illustrate the improvements in timeliness and quality / integrity of data from the platform, thus inspiring other entities to adopt the standards and platform as well.
- They can use data from the platform to set benchmarks for implementation efficiency and improvements in service delivery, which can be incorporated into mission / scheme targets and conditions for subsequent years.
  - » They can automate the creation of utilisation certificates on the basis of this data, reducing a key administrative burden that line departments at the state and local government levels face.
  - » They can also give priority in processing and disbursal of fund requests / tranches to entities that have adopted the standards and are reporting data through APIs, relying on these automated UCs.
- They can share data from the platform with recipients as inputs to subsequent cycles of planning, together with recommendations on ways to improve operational efficiency, coverage, inclusivity etc.
- They can use data from the platform as the basis for outcome-oriented evaluations, impact assessments, social audits etc., including in collaboration with researchers / academic institutions / citizens' groups.

## Role of State Governments

State governments are “ground zero” for adoption of fiscal event standards and the iFIX platform / adapters. The stakeholders who would gain the greatest degree of visibility into the financial health and efficiency of their jurisdiction would be the Finance Departments in the States, as a cross-departmental integration of iFIX would pull together both allocation / expenditure transactional data (public goods created, public services and direct benefits delivered).

- State finance departments can adopt the fiscal events standard, and encourage line departments and implementing agencies to adopt it as well; they can create a state-level instance of the iFIX platform, and encourage line departments and implementing agencies to access and report data through this channel.
- State finance departments can give priority in processing demand / payment requests from entities who adopt the fiscal events standard and iFIX platform or adapters; in particular, they can ensure that funds that have been committed to such line departments are released without any delays or deviations from the approved amount.
- State finance departments can coordinate with experts in fields such as accounting, planning, municipal finance etc. and make their services available to line departments, local governments etc. as shared resources, supporting the adoption of the fiscal event standards, iFIX platform / adapters, and subsequent reforms that leverage the data from the platform.
- State finance departments can present data from the iFIX platform periodically, including as inputs to the State budget, and State Finance Ministers can highlight improvements in timeliness and quality of data received from entities who have adopted the iFIX platform / adapters.
- State finance departments can give priority / preference in terms of offering additional guarantees or underwriting borrowings for line departments, local governments etc. that have adopted the fiscal event standards and iFIX platform / adapters. Over time, state finance departments can make these prerequisites for any such underwriting.

In turn, line departments in the States can demonstrate the full potential of the fiscal event standards and iFIX platform / adapters by adopting it and integrating it with their operational / transactional systems.

- This will enable the linking of a given proposed or actual expenditure to specific outputs and outcomes: public goods created (e.g. through infrastructure corporations or public works departments); public services delivered (e.g. through parastatal corporations or local governments); and direct benefits transferred (under various missions / schemes).
- Line departments can request and work with the finance department to automate or accelerate the UC creation - approval - fund disbursement process, using the real-time transactional data from the iFIX platform.
- Line departments can use data from the iFIX platform as a reasoned basis when explaining deviations from plans or making requests for additional / unplanned funding.
- Line departments can use data from the iFIX platform as an input to planning & estimation in subsequent cycles, including as a starting point / input for participatory processes.

## Role of Private Sector Stakeholders

Among the key private sector stakeholders who can accelerate the adoption of the fiscal events standards and iFIX platform / adapters are banks / financial institutions.

- They can integrate their IT systems with the iFIX platform instance or instances adopted by various government entities (union, state, or local government, parastatals, etc.).
- This will enable them to directly process a number of fiscal events (DEMAND, RECEIPT, CREDIT / BILL, PAYMENT, DEBIT) and share these with the relevant department(s) in real time.
- Over time, this can be the basis for smart contracting applications to be built on top of the iFIX platform.
- Based on their experience, banks can also provide feedback and suggestions on the fiscal event standards and the iFIX platform / adapters, leading to improvements in design and implementation.
- Banks can evangelise the platform / adapters to their government clients, highlighting the improvements in timeliness and reliability, and reduction in administrative burden / paperwork related to those transactions.

Vendors to government can present information at various stages, most notably billing / invoicing, in keeping with the fiscal event standards; if a suitable interface is built for them, they can even submit it directly to the software systems of the relevant government entity, which in turn could be integrated with the iFIX platform / adapters.

- This should speed up the processing time for such bills, improve the rate of timely payment, and provide high-quality data as an input for accounting, auditing, and planning / estimation processes.

Software vendors / GovTech market players and systems integrators (SIs) can learn about the architecture, building blocks, deployment model, and capabilities of the iFIX platform, and leverage these in their own products and offerings.

- As a DPI, iFIX envisions multiple new use cases, applications, and innovations being built on top of the minimal set of initial functionalities that the platform provides. Private sector developers will play a major role in creating these.

- Especially where such development is commissioned by government (i.e. funded by the use of public money), the applications developed can be contributed to a growing repository (an “app store”, as it were) that can in turn be leveraged by more government entities around the country. This will further enhance the value proposition of adopting the fiscal event standards and iFIX platform / adapters for more and more government bodies.

Finally, academic institutions and researchers can collaborate with government bodies at various levels to study data and analytics from iFIX.

- They can use this to test existing models for PFM and good governance;
- to develop new models that can address various concerns, including
  - » fiscal discipline and sustainability at all levels of government,
  - » effective resourcing for responding to emergencies and disasters,
  - » optimal strategies for raising credit / debt by government,
  - » effective plans for improvements in efficiency of public goods creation / maintenance and delivery of public services,
  - » factors in making direct benefits more inclusive, etc.



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