Digital Infrastructure

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FINANCE MINISTRIES MUST THINK ABOUT DIGITAL PUBLIC INFRASTRUCTURE AS THEY DO ROADS AND POWER GRIDS

A government wouldn't build a dozen roads connecting the same two places. But this happens often with digital services. Countries allocate billions to IT spending without realizing the need to treat these systems as shared infrastructure. This siloed approach fragments systems, making it harder to share or leverage data among public agencies and with the private sector.

What if we treated a set of core digital systems—such as digital IDs, payments, data exchange platforms, credentials, and other shared services that drive core functions across government and the economy—the same way we treat roads or power grids? As essential, long-term, shared systems designed for repeated use.

This approach requires two significant conceptual shifts beyond the usual focus on technology. The first is economic. If roads connect places, digital public infrastructure (DPI) connects institutions and multiplies the potential for value. A digital ID—India's Aadhaar system, for instance—delivers direct efficiency savings, reducing fraud and benefit claims. Its value grows with use, such as improving service targeting or enabling secure access to education and health care. Over time, it can reshape or grow markets. A digital ID system for universal identity verification can lower compliance costs for financial institutions, expand access to credit, and open the door to new business models across the economy. In India, Aadhaar dramatically lowered know-your-customer costs and fueled a dramatic increase in cell phone adoption.

DPI's largest economic impact, like that of other types of infrastructure, stems not from immediate effects but from the broad economic activities they enable, like a new railway line that spurs growth along its route. Malawi, for example, significantly improved credit markets by making it possible for lenders to verify borrowers' identities more accurately when it introduced biometric identification. This unlocked new economic opportunities by

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reducing default risk and expanding credit access, particularly for marginalized groups.

These positive outcomes aren't guaranteed, however. Many countries have invested in DPI, but neither govern nor finance it as infrastructure. A global DPI mapping initiative, led by University College London, identifies over 64 national digital identity programs, 97 digital payment systems, and 103 data exchange platforms with infrastructure-like potential. Yet few are widely used. Only about half of national ID systems are used by more than two public services. South Africa has eight national data exchange platforms operating in isolation.

State capacity

The second conceptual shift relates to state capacity. The advent of digital technologies has raised citizens' expectations of what constitutes good service—namely, speedy, effective, and frictionless. These outcomes depend on a range of underlying capabilities, especially the ability to connect and take advantage of different datasets. However, the siloed development of digital services, authentications, and applications—common across the public sector—not only increases costs and complexity but also hits smaller services harder and reduces the state's capacity to integrate data and respond effectively.

Collectively, without a broad view of digital infrastructure, state capacity diminishes. Governments' credibility, resources, and ability to adapt quickly and respond to emerging problems with new programs and policy responses decline. Failure to adopt a broad strategic framework for digital infrastructure will strain the economy and government efficiency, particularly in an era of growing geopolitical, economic, and environmental instability.

Finance ministries know this. Over the past year we've held a series of workshops with treasury and finance officials from over 50 countries, and many highlighted DPI's potential to reduce duplication, cut administrative costs, improve tax collection, and strengthen oversight. But across the board, officials emphasized a key concern: Value for money must be visible and visible quickly.

This partly explains the continued duplicative and fragmented efforts of many finance ministries when it comes to funding digital systems. These ministries acknowledge growing research showing that traditional appraisal methods, such as cost-benefit analysis, do a poor job of capturing the total value of infrastructure. These project-oriented tools tend to oversimplify complex system links, prioritize short-term results, overlook spillover effects, and fail to capture distributional aspects. As one finance official put it, "There's no category in the budget for systems that benefit everyone but belong to no one."

Government-wide change

Our workshops and a policy paper with Sumedha Deshmukh encapsulate the real challenge: Turning software into infrastructure takes more than good technical design. Digital ministries alone often struggle to drive government-wide change because they typically lack control over budgets, the authority to coordinate across ministries, or the institutional leverage to enforce shared standards. Finance ministries can fill these gaps, thanks to the critical fiscal and coordinating authority necessary for adoption and sustained support. The ability to steer the adoption of infrastructure—aligning ministries, setting standards, and mandating repurposing of existing resources—is also critical. These shifts are of course not straightforward, given three core issues that often stand in the way.

The first is coordination. Finance ministries recognize that digital infrastructure is necessary for interoperability and efficiency—but they're also expected to respect the autonomy of other ministries. In practice, they often play a reactive role, assessing proposals rather than shaping digital strategies from the outset. "We're goalkeepers, not strikers," as one official put it. In many cases, technical expertise lies elsewhere. Governments must implement a strategic approach that permits the finance ministry to support efficiency gains and innovations generated by shared platforms.

The second is financing. DPI needs long-term investment to build, maintain, and upgrade systems. Yet political and budgetary pressures usually favor quick wins. Several officials at our workshops were concerned that donor-driven projects were being launched without clear plans for long-term funding. Dispersion of DPI spending across many budget lines also makes it harder to plan and manage infrastructure as a coherent whole.

The third is appraisal. Most digital proposals are assessed using cost-benefit analysis tools that struggle to capture DPI's long-term, cross-sector spillovers. Officials noted the challenge of projecting returns from shared platforms, especially when value comes not from direct savings but from better services, less leakage, or brand-new capabilities. Many stressed the need for clear applications for the DPI and early success to build momentum, even when broader benefits may take years to materialize. The problems identified suggest that DPI considerations should be embedded in governments' public investment management frameworks and multiyear budgeting plans.

From gatekeepers to stewards

Our research also reveals interesting patterns around the world about new ways ministries of finance are engaging in long-term investment and alternatives to cost-benefit analysis. Across countries, three roles are emerging—not as fixed models, but as a spectrum of ways authorities can engage.

Some ministries act as evaluators, assessing digital proposals with an eye toward infrastructural potential. In the UK, the shared notification system for the whole government, GOV.UK Notify, has quietly become a benchmark—prompting broader discussions about how to appraise shared digital systems. As the UK launches more digital infrastructure services, such as GOV.UK Pay and GOV.UK One Login, debate is stirring about how these services will be financed and assessed appropriately.

Other finance ministries are acting as coordinators and enforcers, using budget processes to align departmental investments, veto duplication, and promote shared use. In Uganda, the Ministry of Finance and the National Planning Authority introduced a programmatic budgeting model that requires agencies to submit IT needs collectively.

This way the ministry can flag overlapping proposals and promote existing infrastructure as a default option. Procurement policies now require clearance from the national information technology regulator, which reinforces technical standards and usability. As one official noted, "There's no justification for an agency to procure a service we already have."

In rare cases, finance ministries take on full implementation of core DPI components. For example, CamDX, in Cambodia, a data exchange platform, initially focused on business registration but now does much more.

These roles aren't mutually exclusive. What they share is an understanding that DPI isn't just a technical investment—it's a public asset. Finance ministries don't need to build it—they need to shape the logic, incentives, and conditions for its success. Strategic stewardship, not just fiscal oversight, is critical to unlock the full potential of digital systems as infrastructure.

Central to these roles is how finance ministries navigate the governance of this new digital infrastructure, particularly given their central responsibility for budgeting, managing fiscal risks, and ensuring value for money. As guardians of public resources, finance ministries are uniquely positioned to address critical challenges such as financial sustainability, effective long-term stewardship, and maintaining public trust.

A digital state

As governments adopt AI and digital services, the cost of maintaining fragmented systems—from data storage to computing power—will rise sharply. Shared digital infrastructure provides a solution: scalable, integrated platforms generating lasting public value. This will require new state capacities, particularly around governance and trust. Digital identities, payment systems, and data exchanges that reinforce surveillance or fail to reduce administrative burdens risk rejection by citizens.

Ultimately, as digitalization continues, the risk of continued fragmentation, and its economic and societal costs, will only grow. These costs can be especially high during a crisis. During COVID, for example, the US allocated $800 billion to its Paycheck Protection Program. At best, only between a quarter and a third of those resources reached the workers most in need, while the rest ended up with wealthier households, according to an analysis by David Autor and colleagues at the American Economic Association. "Harnessing modern administrative systems, other high-income countries were able to better target pandemic business aid to firms in financial distress," they concluded.

As more governments and donor agencies eschew digital duplication in favor of shared infrastructure, finance ministries have an important role to play. Without their leadership, digital infrastructure risks becoming a graveyard of pilot projects too fragmented and expensive to sustain. Finance ministries must steer a critical shift: from funding isolated projects to launching shared infrastructure; from short-term savings to long-term public value; and from fragmented ownership to institutional stewardship. F&D

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