Government Trends 2024

A report by Deloitte Center for Government Insights

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The eight trends propelling the 10x government of the future

The convergence of technology with process, policy, workforce, and regulatory innovations is enabling governments to exponentially enhance service delivery and operations.

Around the globe, we are seeing signs of a renaissance, a moment with the potential for sweeping improvements in service delivery and operations—a transformation that, to some, may seem implausible. Why the skepticism? Well, trust in governments worldwide is scraping historic lows,[1] with governments often perceived by citizens as slow-moving, bureaucratic, and risk averse.[2]

Yet, amidst this pervasive pessimism, a global scan of government trends offers reason for profound hope. We've identified more than 200 cases worldwide that offer proof of radical transformation, where government agencies have achieved quantum leaps, delivering upward of 10x improvements across areas ranging from operational efficiency to customer experience to mission outcomes.

WHAT CONSTITUTES A "10X" GOVERNMENT IMPROVEMENT?

It's a seismic shift, a literal tenfold reduction in costs or a slashing of cycle time by a staggering 90%. But more often, it's an intangible enhancement—a vastly improved customer experience that defies precise quantification yet represents a marked improvement.

So, what emboldens our proclamation of "10x government" as a defining trend of 2024? First, real-world examples are cropping up globally, showcasing instances of dramatic improvements. More importantly, the ongoing digital metamorphosis of governments—including digital workflows, cloud-based data and applications, the use of predictive analytics, and more—that has been unfolding over two decades has laid a robust foundation for the emergence of artificial intelligence (AI) technologies, including generative AI.

At its core, 10x government is about convergence—orchestrating a harmonious interplay of technology, process, policy innovation, workforce, and regulatory changes to engineer unparalleled results. The ongoing digital revolution has already set the stage for significant shifts, with telehealth revolutionizing health care accessibility and cloud computing endowing governments with unforeseen resilience.

Now we are at another jumping-off point in the digital transformation journey—the AI revolution. Many governments are using AI to detect fraud, reduce costs, improve the customer experience, and streamline processes. In general, the successful use of AI has been built on top of a robust digital public infrastructure.[3] Not all governments have yet attained a strong digital

foundation.[4] But for those that have, 10x improvements are a real possibility—and, in some cases, are already a reality.

But technology alone won't cut it. True transformation demands the synergy of technological advances with business innovations, human-centered design, behavioral nudges, and breakthrough cross-sector collaborations that enable agencies to leverage private-sector investment, scale, and technology.[5]

Deloitte's *Government Trends 2024* report focuses on quantum leaps in public-sector performance. Concrete examples bring this narrative to life. Take Houston's staggering 64% reduction in homelessness since 2011.[6] Or India's Aadhaar initiative, the unique identifier that's fast-tracking financial inclusion by an estimated four decades, bringing 80% of the population into the formal banking system in six years compared to what otherwise was expected to have taken 47 years.[7] These examples serve as testaments to the transformative power of convergence.

Convergence: The key to 10x change

The impact of innovation can be multiplied when several novel approaches are brought together. This convergence can occur through either serendipity or intention.

A historical lens provides context. The convergence of innovations between 1870 and 1970 took decades to transform humankind's productive capability. The internal combustion engine, the harnessing of electricity and petroleum for energy, and the telephone and telegraph changed the world. But, it often took decades for these innovations to have a major impact, and it often required additional innovation to scale their impact.[8] The light bulb was invented in 1880, but it wasn't until the Rural Electrification Act of 1936 that electricity was distributed to rural regions in America.[9] The Ford Model T rolled into production in America in 1908, but it took the Interstate Highway Act of 1956 to realize the automobile's transformative potential.[10]

In stark contrast, the combined impact of the internet, the smartphone, and general computing power ushered in transformative change in under 30 years.

This relates to 10x government in the current context. Amidst the throes of the fourth industrial revolution, governments can strategically combine a plethora of new tools and strategies for transformative impact (figure 1). The power lies in synergistic convergence: melding disparate tools to birth something entirely new.

Consider India's Aadhaar initiative mentioned earlier, the fast-tracking of the country's financial inclusion efforts. Achievement of this magnitude would not have been possible without combining tools like Aadhaar (India's unique digital identity for citizens) and digital payment system with public-private partnerships, supportive legislative and policy frameworks, and digitization of the physical know-your-customer process.[11] Banks and financial technology companies helped the government by developing innovative services on top of Aadhaar's digital infrastructure to improve financial inclusion.[12] Further, the Reserve Bank of India (India's central bank) paved the way for the use of Aadhaar in the know-your-customer process in 2013.[13]

KEY TOOLS ENHANCING INDIA'S FINANCIAL INCLUSION

Digital identity + digital payments + policy reform + public-private partnership (banks and fintech) + re-imagined workflows = Massive acceleration of financial inclusion goals

European countries, meanwhile, have spent the last decade implementing the "Once Only Principle," where citizens and businesses must share the same information only once with governments. This is estimated to save 855,000 hours for citizens and 11 billion euros for businesses annually.[14]

Not surprisingly, implementing the Once Only Principle has required integrating a host of specific tools and activities, including technology and data-sharing platforms,[15] digital identity, workflow reengineering, data privacy laws, and providing legal validity for shared documents. Using the Once Only Principle, Austria has made it easier for doctors, care facilities, hospitals, and other health care professionals to access patient information through a data platform, eliminating the need for patients to share their medical history repeatedly.[16] The same principle helps citizens in Estonia file tax returns in just five minutes.[17]

Figure 1

The convergence of multiple tools and strategies can enable 10x improvement in government outcomes

Source: Deloitte Insights.

REDUCING FRICTION THROUGH THE EUROPEAN UNION'S ONCE ONLY PRINCIPLE

Digital identity + data-sharing + shared governance + regulations and policy reforms + technology platforms + network mindset = Seamless services

Such synergistic convergence is powering 10x government improvements in equity, customer experience, productivity, resilience, innovation, and agility—enabling governments around the world to find opportunities to transform current processes and achieve outcomes in entirely new ways.

The eight "10x" trends transforming government in 2024

Launched in 2019, the Deloitte Center for Government Insights' *Government Trends* report has covered trends in each iteration that continue to hold relevance today (figure 2). Some trends, such as digital government, have been constant throughout the years. Others, such as equity and resilience, have emerged more recently. The 2024 report identifies eight trends transforming government, each of which showcases profound 10x improvements.

It should be noted that a trend is considered a trend when it is observed across multiple levels (federal, state, and city) and geographies across the globe. The trend should not be confined to a single place or experimental pilots; instead, it should actually be *emerging*. Additionally, for something to be recognized as a trend, it should be relevant to governments and economies of all sizes.

These eight trends, taking root across the globe, from small countries like Portugal and New Zealand to large countries like India and the United States, demonstrate the power of convergence to turbocharge 10x government.

Government at warp speed: Government leaders worldwide are seeing ever-greater benefits of increased operational speed. By introducing new technologies along with reimagined processes, governments can deliver faster services with far less friction without sacrificing service quality.

State of play: Scores of government agencies across the globe are challenging the widely held assumption that governments typically move slowly. Many of the remarkable 10x advancements we describe are in speeding up government processes and service delivery, from benefits eligibility to permitting to procurement.

Unleashing productivity in government: Advances in AI, including generative AI, provide an opportunity to jumpstart a new era of increased productivity in the public sector. Governments should ensure that they have a solid foundation of digital capabilities—including data, cloud, and digital processes—and then test and scale powerful AI applications.

State of play: While still in the early days of transformation, advances in AI, including generative AI, provide an opportunity for a decade or more of deep productivity improvements in government.

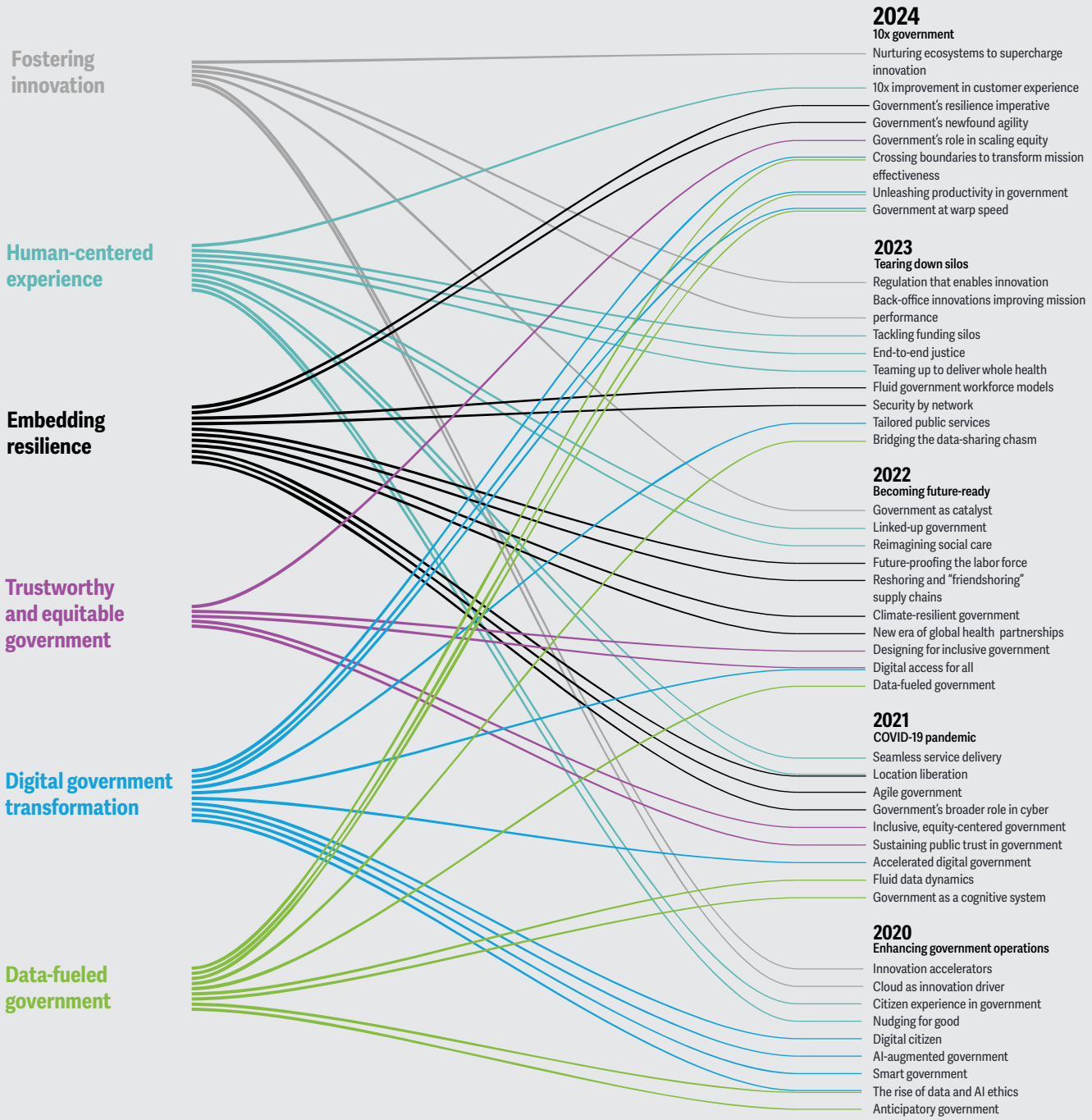
Government's newfound agility: Today, it seems one crisis hardly passes before the *next* crisis arrives. In an era of rapid change, government leaders are embracing the imperative of being *agile*. Many governments are abandoning traditional processes to move toward flexible approaches to policymaking, funding, technology development, and decision-making.

State of play: Agile government is on the rise worldwide with agencies increasingly using agile approaches in procurement, regulation, policymaking, workforce deployment, funding, and even constructing physical infrastructure to achieve 10x change.

Nurturing ecosystems to supercharge innovation: Addressing modern challenges often demands innovation at a scale that governments cannot achieve alone.[18] Consequently, governments are cultivating ecosystems of problem solvers spanning industry, academia, and the public sector. Governments are aligning stakeholder incentives to nurture these ecosystems and creating conditions that encourage private sector participation. Policymakers can incentivize the private sector and help spur 10x innovations through subsidies, tax breaks, funding, regulatory easing, and knowledge-sharing.

Figure 2

Government trends continue to remain relevant and evolve at the same time



Source: Deloitte analysis.

State of play: Governments around the world are beginning to deploy the full array of tools to not just create one innovation, but to catalyze a whole ecosystem to create 10x innovation.

Crossing boundaries to transform mission effectiveness: Addressing big challenges often extends beyond the scope of individual government agencies. Effective solutions often require collaborative efforts, fostering partnerships between multiple government entities and the private sector. Using technology infrastructure and policy measures, governments are helping to address some of the toughest societal problems that transcend traditional jurisdictional boundaries.

State of play: Governments are increasingly recognizing that excellence in cross-boundary collaboration provides the key to achieving 10x-level improvements in mission outcomes.

Government's resilience imperative: Governments that are grappling with a 'polycrisis' world prioritize building resilience against various threats, including global conflict, climate change, supply shocks, refugee migration, cyberattacks, and more. They are enhancing their capacity to operate during disruptions while safeguarding the community.

State of play: Governments are upgrading critical infrastructure and deploying emerging technologies like AI and digital twins to gain a deeper understanding of challenges and implement effective countermeasures. Success depends on aligning corporate and government interests to foster effective cross-sector collaborations to solve problems.

Government's role in scaling equity: Building a future of equity often requires systemic changes and continually adapting policies, regulations, and services to make them more balanced and accessible. By focusing on three primary spheres of influence within government organizations—the workforce, vendor ecosystems, and communities and society—governments can help advance equity within and outside their agencies.

State of play: Governments are designing inclusive policies and accessible services for the public, building a diverse public-sector workforce of the future, and engaging a broader vendor ecosystem to achieve more equitable outcomes.

10x improvement in customer experience: Digital technology offers the opportunity for 10x-level improvements to customer experience. From businesses applying for licenses online to individuals using a digital ID to access welfare benefits, digital services are helping governments be efficient, frictionless, and personalized. Digital public infrastructure like digital identity, digital payments, and data exchange platforms can create a proactive government that anticipates citizens' needs.

State of play: Through strategies like life events-based service delivery, human-centered design, and vigorous customer experience measurement systems, governments have made major strides in customer experience over the past decade. The growing adoption of digital public infrastructure platforms can enable them to take previous improvements to a whole new level.

In this era of unprecedented possibilities, governments stand at the threshold of transformative change, armed with the tools, strategies, and collaborative mindset to help propel them into a future where 10x improvements are not just aspirational but also achievable realities.

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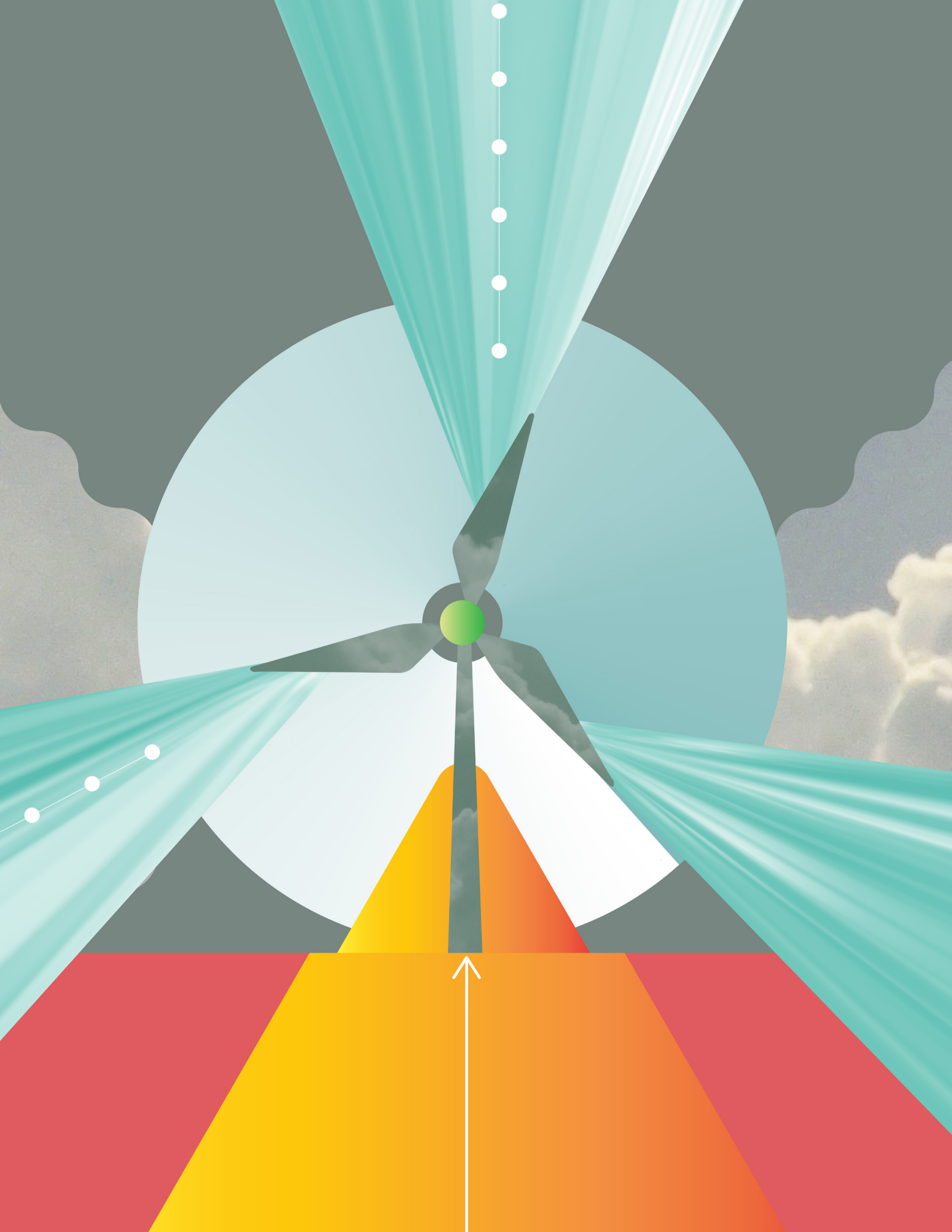


Government at warp speed

How agencies are accelerating public-service delivery and reducing burdens on citizens and businesses.

With environmental and societal factors driving changes quickly, it is increasingly necessary for the government to accelerate its pace, not only to deliver services quickly but also to help save lives.

Consider wildfires, whose rising scale, intensity, and frequency—amplified by global warming—strain agency capabilities more with every new fire season.[1] In the United States, flames have consumed five million acres, endangering human lives, wreaking havoc on infrastructure, and potentially displacing and destroying entire cities.[2] And the impact goes far beyond community and state lines: Wildfires release massive amounts of greenhouse gases into the atmosphere, contributing to increased temperatures and the chances of extreme weather events—including future megafires.[3]

Government agencies are responsible for controlling and stopping wildfires, and that begins with responding as quickly as possible, from immediate detection to rapid activation of resources. California, reeling from years of severe fires,[4] is deploying new technologies and engaging in various partnerships to address this issue.[5] Most notably, the state's Department of Forestry and Fire Protection has joined forces with a consortium of universities to introduce a network of more than 800 artificial intelligence–aided infrared cameras placed in and around the state's most fire-prone regions.[6] The ALERTWildfire system aims to enable quick wildfire discovery, location, and confirmation, allowing first responders to make rapid, informed decisions based on real-time situational awareness. In the past, fireground commanders needed as much as 20 to 30 minutes to determine where to deploy to a fire, gather information, and act. But now, thanks to cameras and AI-based analysis, they can react within seconds of the initial detection.[7] Other countries, such as Australia and Turkey, are also utilizing AI to predict, detect, and prevent wildfires.[8]

Breaking trade-offs

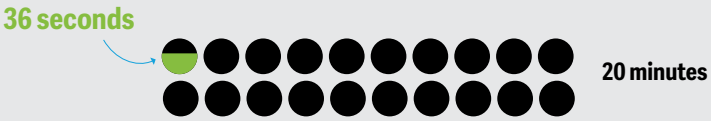
Governments are becoming faster at delivering services, responding to disruptions, and reacting to citizen feedback even when lives and homes aren't in imminent danger. This change can also be seen in organizations with long-standing structures and practices as they adopt new technologies and processes, jettison outdated rules and regulations, and strike a balance between speed and checks and balances. These mechanisms are revolutionizing the way agencies operate.

Figure 1

By the numbers: Government at warp speed

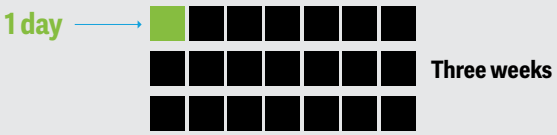
New South Wales Seniors Card program now allows business to register digitally in **under 10 minutes, instead of the previous four-week** paper-based process.

Romanian Ministry of Labor used RPA to distribute direct payments to self-employed workers during the COVID-19 pandemic, **reducing processing time to 36 seconds from 20 minutes**.

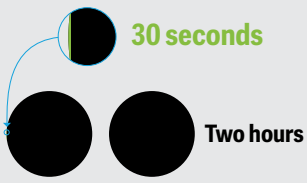


US students can now apply for financial aid online in **just 10 minutes**, thanks to backend data integration. This process earlier **took over 13 hours**.

The US National Institutes of Health's National Institute of General Medical Sciences innovation in grant processing reduced time taken to process applications **from 2–3 weeks to less than a day**, speeding up their mission to make scientific discoveries.



Estonia revamped its family benefits systems to make it more proactive. The process previously took **two hours and now takes just 30 seconds**.



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Speed of action can be a particular challenge in the public sector. Unlike commercial companies, agencies must adhere more strictly to a set of broad public commitments, such as democratic processes, proper stewardship of public money, and equal treatment for all. While these obligations are necessary and important, they can also affect planning and execution, imposing added obligations on both citizens and businesses.

However, agencies around the globe are challenging the common assumption that the government *must* move slowly and deliberately. Public sector leaders are speeding programs and operations by up to 10 times without sacrificing democratic accountability and fairness by progressively integrating cutting-edge technologies, reimagining processes, and collaborating with diverse partners to enhance their capacity to operate more swiftly.

Convergence: The key to 10x increase in speed

Agencies are overcoming constraints to achieve 10x improvement in speed by using robotic process automation and data analytics to minimize processing times and reduce paperwork burdens. Additionally, they are sharing data more effectively to break down jurisdictional silos and deliver better and faster services. They are also employing new AI-based technology—generative AI in particular—to improve interactions with citizens and businesses, analyze and summarize large volumes of stakeholder input, automate administrative tasks such as report generation, code software solutions, and even suggest tailored solutions.[9]

A convergence of technology, processes, and policy tools can create greater transformational change. Consider how combining different tools might have tangible impacts on constituents, businesses, and government operations:

- Digital technologies + human-centered design + evidence-based policies + contracting = Reduced wait times
- Digital infrastructure + customer-centric mindset + regulations + shared governance = Simplified business license application
- Robotic process automation + AI + human-machine teaming + human-centered design + cloud + machine learning = Accelerated grant application process

Trend in action

Government leaders worldwide increasingly recognize the benefits of increased operational speed, from facilitating timely access to citizen services to fostering a thriving business environment. Agencies are applying tools in three distinct areas to help accelerate their operations:

- Between government and citizens to speed up service delivery
- Between government and businesses to fast-track permitting, licensing, and regulatory processes
- To procure services and issue grants

Speeding up constituent services

Accelerating action begins with understanding. By fully grasping citizens' ever-evolving needs, agencies can better determine how to respond more effectively and efficiently, address challenges, and provide timely solutions.

Simplifying government processes can speed up service delivery and aid users by eliminating redundant steps. In the United States, completing the application process for college financial aid once required more than a dozen hours.[10] Today, however, through process improvements, human-centered design, and technology adoption, college-bound students can quickly apply for financial aid online. This process takes around 10 minutes and pulls income and tax information directly from Internal Revenue Service data. Moreover, the system also saves students' information for next year's application.[11]

Scores of government agencies have significantly reduced wait times, which has been a source of perennial constituent frustration and also contributed to operational inefficiency. Leaders have seen streamlined processes enable innovation and the ability to improve citizen experiences more proactively. In the Northwest Territories of Canada, getting access to mental health counseling "was like waiting to get access to a backhoe when all you need is a shovel," one service user told the Mental

Health Commission of Canada.[12] No longer: The Mental Health Commission of Canada slashed average wait times for mental health counseling from 19 days to just four by implementing a system for organizing and delivering evidence-based mental health and substance-use services. The agency has streamlined its intake processes, introduced drop-in counseling sessions and e-mental health services, and established a mental wellness and addictions recovery advisory group.[13]

Fast-tracking business success by speeding government processes

Boosting speed and efficiency can do more than just raise constituent satisfaction scores. Easing government regulation and streamlining permitting processes can have an outsized impact on business investment and activity.[14] Reducing time delays in permitting, easing reporting requirements, and eliminating friction between government and private enterprises can help make the business climate more competitive and hospitable for innovation. A customer-experience mindset—based on understanding customers, focusing on user design and experience, and creating a unified vision for change[15]—can help regulators make compliance much easier for consumers and businesses, boosting voluntary compliance rates.

Take the ongoing transition to renewable energy. As governments race to meet climate goal deadlines, faster regulatory approvals of green energy projects are crucial.[16] Securing all the requisite licenses for project initiation and operation and obtaining permits for renewable energy projects typically necessitates engagement with government entities at both the national and local levels. Engaging with multiple agencies can place serious administrative burdens on businesses. It can delay projects by months, years, or even longer—a disincentive to initiating projects at a time when climate imperatives should be paramount.[17]

To minimize delays, Denmark has eliminated the need for businesses to liaise with multiple distinct agencies for various clean energy projects.[18] The government has adopted a one-stop-shop approach, with the Danish Energy Agency serving as the sole point of contact, coordinating with relevant public authorities and granting all key wind-farm licenses.[19] The streamlined permitting means a more efficient process for establishing wind farms.[20] Denmark can now process wind farm permits in just over 10 days, compared to potentially months required to navigate other European nations' labyrinthine systems.[21] Denmark's system also enables businesses to install an offshore wind project within a 34-month time frame, versus other EU nations' processes, which can stretch to as much as eight years or more.[22]

Other European countries are taking steps to replicate the Danish approach. The European Commission's REPowerEU plan aims to accelerate the transition to green energy by minimizing policy uncertainties and streamlining permitting processes.[23] Estonia's online platform allows companies to submit permit applications, track progress, and receive integrated permits within 180 days.[24]

Simplifying regulatory procedures and reducing unnecessary processes can foster innovation, promote economic growth, and attract investment. Access Canberra, an Australian Capital Territory government service that connects customer and regulatory services, established an Event and Business Coordination team to simplify applications and streamline risk and approval processes for road closures, public land use, liquor sales, gaming, noise control, security, and food services. Businesses used to need to ask 17 different organizations for approvals for territorial events, providing the same information over and over to different agencies. By consolidating processes based on a tell-us-once approach, the Event and Business Coordination team has saved businesses tens of thousands of hours previously spent filling out paperwork.[25]

Procuring services and issuing grants

Some agencies have tapped the power of technology-enabled process reengineering to achieve 10x improvements in speed. This can be seen across a spectrum of government activities, including human services agencies processing claims faster, education and health departments issuing grants quicker, and human resources units speeding hiring processes.

At the US National Institutes of Health, the world's biggest funder of biomedical research,[26] staff had long manually reviewed applications to categorize them by scientific discipline—a laborious and repetitive process stopping up the referral pipeline. However, a

system by the National Institutes of Health's National Institute of General Medical Sciences now deploys AI technologies to allocate grant applications to suitable peer review groups. It uses a tool that reads and analyzes the application's text, title, and abstract and assigns it to an appropriate group with a 92% accuracy rate. This implementation slashed the typical grant review time from two to three weeks to less than a day. The approach not only expedites the process but frees up program officers, enabling them to redirect their efforts toward higher-value activities.[27]

Reimagining outdated processes can also improve an agency's likelihood of mission success. Take military procurement, which is essential to military readiness and national security. Historically, it has been challenging for defense agencies that need to mobilize resources and people quickly. Modern military software is usually built on commercially developed technologies and products that are updated every 12 to 18 months. However, agencies often struggle to align it with their current, sometimes outdated, systems. Traditional defense procurement processes, with lengthy requirements and detailed solution specifications, can leave not only warfighters poorly equipped but also systems that struggle to do what decision-makers need.[28]

To counter this issue, the US Department of Defense established the Defense Innovation Unit to analyze and update how the military acquires critical capabilities and resources. Central to the agency's approach is novel uses of transaction authorities, such as *other transaction agreements* that can allow government entities to circumvent traditional acquisition procedures and award contracts to companies developing prototypes. Viable prototypes can directly transition into production without additional competitive processes. Leveraging these authorities, the Defense Innovation Unit has increased the number of dual-use technologies that have civilian and military use.[29] Since its establishment in 2015, the agency has awarded more than 350 contracts to commercial companies in half the time it traditionally takes.[30]

Inês dos Santos Costa, Former Secretary of State for the Environment, Portugal[31]

My take

Simplifying regulatory procedures can improve the speed and efficiency of government

For businesses, navigating government regulations can be a complex and time-consuming process. With multiple overlapping regulations, several government entities involved at different levels, and legacy processes, it's easy for businesses to lose track of different processes and simply give up, which can lead to the loss of valuable opportunities.

In Portugal, we are making it easier for businesses to interact with the government, reducing friction points between the two in the regulation space. Take the environmental licensing system. We introduced several reforms to our existing system to simplify and expedite it, accelerating our transition to a green economy.

The Portuguese Single Environmental Licensing (LUA) system was launched in 2015 to streamline and speed up the environmental licensing system. Since then, we have been consistently evolving and integrating new requirements for ease of organizations. The latest changes introduced in 2023 have been a game-changer in making it easier for businesses to comply with environmental regulations.

Today, the LUA issues a Single Environmental Title that consolidates all environmental licensing decisions and summarizes all information related to the business requirement for a given project.[32] The goal is simple: one request, one certificate, one fee. This streamlines environment-related licensing requirements and coordinates with various institutions in charge of the permits under the portal, ultimately reducing the time it takes to obtain multiple licenses.[33]

A key of the LUA system is a time simulator. This tool guides users through the entire process, helping them understand which regimes apply to their case, the associated fees, the licensing entity, and the expected time of issue. Once the process starts, an integrated timeline is included in the dashboard that allows users to visualize where the process is and the expected time of issuance.

Portugal has also made significant strides in reducing fees associated with environmental licensing. Depending on the type of licensing, some fees have been reduced by more than 50%, with the average reduction being around 20%.

These reforms to the licensing process also aim to eliminate redundancies and the need for resubmission upon license expiration. This not only speeds up the licensing process but also represents an important step forward in fostering a more business-friendly environment.

Reducing administrative and regulatory hurdles is a continuous process for the government.[34] The Portuguese LUA system has been a significant achievement in our efforts to streamline businesses regulations. By simplifying the environmental licensing process and reducing fees, the LUA system has made it easier for businesses to operate more efficiently, ultimately promoting growth and investment in the green economy.

What the 10x future holds

- **Proactive service delivery:** By harnessing emerging technologies and advanced analytical tools, governments can proactively anticipate citizens' unique needs, thus providing services even before receiving formal requests. For example, Austria's family allowance system triggers enrollment in the country's family allowance program upon a child's birth without new parents having to apply for a claim.[35]

- **Instant government:** Agencies can use AI-aided technology to provide real-time answers to citizens, businesses, and employees, and swiftly offer numerous benefits. The US Navy's Amelia conversational AI program can resolve help desk tickets in under 45 seconds.[36] Additionally, by implementing robotic process automation, the state of Ohio has made Medicaid accessible to newborns on their day of birth, a process that previously took seven to 10 business days.[37]

- **Intelligent matching:** Estonia's AI-driven job-matching helps unemployed citizens find suitable jobs. Nearly 75% of candidates who found a job through the system were still employed six months later, compared to only 58% of those who received advice from human officials.[38]

- **Transparency in approval processes:** Conversational AI can provide instant, real-time status updates for everything from businesses inquiring about permits to nonprofits wanting to see where grant applications stand. To encourage transparency and census response rates, the US Census Bureau created a public map of response rates by neighborhood to show how much funding local governments receive from the federal government for infrastructure, education, and other uses. "It was important that we found a way to connect with citizens, to be accountable and transparent," said Gerard Valerio, solution engineering director for the public sector at Tableau, in an interview with Federal News Network. "The more data that's collected results in a higher response rate, and the better it is for a community. With this visualization, residents and community leaders could see their progress and take action to increase the response rate before the collection deadline."[39]

- **Intelligent automation of tasks:** Generative AI has the potential to accelerate administrative tasks, freeing up government employees to focus on higher-value creative or problem-solving tasks. The US Department of Defense is currently testing an AI tool called AcqBot. The tool is designed to streamline and accelerate the department's acquisition and contracting process, which has traditionally relied on manual processes and outdated methods.[40]

- **Government by simulation:** AI and digital-twin technologies can help agencies test policies and programs in real-life scenarios. A digital-twin solution helped San Diego tackle traffic congestion. Citizens were able to visualize how construction projects might affect their travel by generating findings within a few hours or days.[41]

Steps governments can take now

To help achieve 10x increases in speed, governments should consider:

- **Breaking down silos:** Encourage departments to work together, share data, and coordinate efforts, to eliminate friction points and speed service delivery. Integrate services on a single platform to help make it easier and faster for individuals to access and navigate citizen services.

- **Reviewing existing regulatory processes through a customer-experience lens:** Identify bottlenecks, complexities, and inefficiencies to optimize speed and outcomes.

- **Redesigning how work gets done:** Human-machine teaming has the potential to speed up processes radically but achieving 10x improvements will often require re-architecting how work gets done. This entails determining how work should change, who should do the work, and exploring options for human-machine pairing.[42]

- **Reducing response times:** Leverage real-time data and predictive analytics to enhance response times—it could save citizens' time, property, and even lives.

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Unleashing productivity in government

Advances in AI, including generative AI, provide an opportunity for a decade or more of deep productivity improvements in government.

Governments worldwide have long been committed to boosting efficiency and productivity through various reform efforts, both small and large.

The work has mirrored private sector revolutions, breakthroughs, and movements. A century ago, government agencies used cutting-edge technology, including telephones, telegraphs, and typewriters, to help industrialize rural states and nations.[1] In the 1980s and 1990s, the "reinventing government" and New Public Management campaigns drew on the Total Quality Management movement, which was then sweeping corporate C-suites,[2] with reforms aiming to streamline systems, reduce regulatory obligations, and empower agency executives to improve performance.[3]

In the United States, a series of government reforms focused on improving efficiency and effectiveness, from the 1993 Government Performance and Results Act to the 2000 President's Management Agenda to, finally, the 2010 GPRA Modernization Act.[4] Similar initiatives worldwide included Canada's Program Review[5] in the 1990s and the European Union's Lisbon Strategy in 2000.[6] And, in recent years, the public sector, alongside corporations, has taken further leaps in efficiency and productivity: from analog to e-government, and ultimately to complete digital transformation.[7]

A new era of productivity growth

After some stops and starts during and after the dotcom era, governments seem to have found their digital footing.[8] Leaders worldwide have digitally transformed operations and service delivery through the mainstream adoption of cloud computing, improved commercial off-the-shelf software, and a surge in open-source development.[9] Software as a service has enabled agencies to access first-rate programs without needing to build expensive custom systems from scratch. Agile development has helped leaders break up large technology projects into smaller, manageable modules, which has helped cut costs and increased efficiency and productivity.[10]

With the advent of artificial intelligence, governments have reached another jumping-off point in their journey toward productivity and efficiency. Digital transformation has enabled agencies to set up the foundational digital infrastructure required to benefit from advances in AI technologies. The power of AI technologies has been demonstrated in detecting fraud, reducing costs, optimizing resources, improving customer experience, and streamlining back-end processes.[11] Trelleborg, a Swedish town, led the way in 2015 by digitizing its social benefits program, using robotic process automation to slash processing times dramatically.[12] Many other European nations and offices have followed suit, tapping into expanding AI-based capabilities.[13]

The US Internal Revenue Service (IRS) provides a peek into how digital technologies, AI, and process transformation can help improve government productivity. The COVID-19 pandemic strained IRS operations, which was already struggling with a lack of resources and outdated technology.[14] Staff shortages added to the burden of managing tens of millions of stimulus payments and reconciling these payments during the tax season. As a result, customer service suffered. Only 9% of phone calls got answered, the unprocessed paper tax returns backlog surged to 21 million, and the agency kept taxpayers waiting for an average of 251 days for responses to proposed return adjustments.[15]

The IRS turned this around by using technology upgrades, achieving process improvements, and hiring new service representatives. By automating the paper returns–scanning process, the agency could scan 80 times more returns in the first quarter of 2023 than in the whole of 2022. Nine of the most common notices, such as earned income and health insurance tax credits, were moved online. Previously, taxpayers had to respond to these notices via email. The agency hired an additional 5,000 new customer service representatives, which slashed phone wait times from 27 minutes in 2022 to just four minutes by April 2023. The agency also opened 335 new taxpayer assistance centers nationwide, quadrupling the number of taxpayers served in person.[16]

An increase in staffing certainly drove up at least some of the agency's 10x productivity improvements. However, the core change that should persist beyond the hiring surge was the implementation of AI technology. These outcomes align with Deloitte's 2016 analysis that suggested AI's potential to dramatically reduce one of regular government employees' biggest paperwork and operational activities: documenting and recording information.[17]

Generative AI, the technology's latest iteration, has the potential to automate and accelerate countless repetitive tasks such as retrieving relevant information, communicating with others, processing information, analyzing data, and offering informed advice.[18] With this technology, government employees can have decades of policy knowledge at their fingertips, policymakers can compare policies across time and jurisdictions, and case workers can input and retrieve client information remotely.[19]

This trend focuses on governments navigating the transition between digital transformation and the AI leap. Advances in AI provide an opportunity to kickstart a new era of productivity acceleration in the public sector. Just like digital transformation ushered in improved efficiencies, AI promises something similar, if not much more. The next era of deep productivity improvement in government has just begun.

Breaking trade-offs

The public sector's mission of focusing on equity and accessibility can complicate the pursuit of efficiency, cost savings, and productivity. Postal services need to deliver packages to all addresses, not only to the nearest shipping centers. Public schools must educate all students, not only the highest-achieving. Similarly, agencies must provide high-quality services to all population cohorts, not just digital natives.

Unlike private sector companies, government agencies do not have the luxury of quickly redirecting budgets and staff from underperforming departments to promising new initiatives. Service mandates cannot be ignored, even if they're expensive, and traditional cost-value trade-offs often do not apply. Therefore, achieving 10x productivity improvement lies not in cost-cutting but in foundational digital infrastructure coupled with the power of AI.

Convergence: The key to 10x change in productivity

It's happening now. Agencies are using a mix of tools to drive 10x improvements in efficiency and productivity. They are strengthening digital infrastructure by leveraging cloud computing, developing enterprise data lakes, and enabling analytics at scale. They are breaking down jurisdictional silos and barriers to improve data-sharing and integration across government levels. They are embedding AI capabilities into existing government systems and processes. They are driving public workforce skill development to enable employees to leverage new technologies such as generative AI. Above all, they are prioritizing human-centered design to apply technology solutions to real-world problems.

The sweet spot is at the intersection of these technology, policy, and process tools—a synchronous dance between the different elements to generate value that is greater than the sum of its parts. Consider how combining different tools can have tangible impacts on constituents and operations:

- Mobility data + Internet of Things data + analytics = Less congestion
- Robotic process automation + eligibility data + human judgment = Delightful customer experience
- Historical data + machine learning + digital twins = Predictive planning
- Cloud computing + data-sharing + process transformation = Life event–based services

Trend in action

Productivity is about achieving more with the same inputs. As technology has increased productivity, it has also raised our expectations of what government can and should provide. As a result, agencies are under constant pressure to find more ways to do more.

Government agencies have various processes and systems that can be made more efficient. The challenge is to identify and implement the right technological solutions, transform business processes, and update talent policies to fully realize their potential.

Transform business processes for the digital era

Governments have made great strides in transforming and improving digital services, but more needs to be done to reduce duplication, streamline processes, and accelerate digital transformation.

Consider life event–based service delivery. Individuals experiencing a major life event, such as a birth or death, have traditionally had to engage with different government agencies. However, these agencies can collaborate proactively to make the process easier for citizens. This effort requires a fundamental transformation of traditional processes, improved data-sharing, and digital technologies to anticipate citizen needs and guide them through their likely next steps.[20]

Austria is a pioneer in delivering life event–based family services. In 2014, the federal government launched the Antragslose Familienbeihilfe program (child benefit without application) to automatically trigger child benefits for new parents. Before the program, parents needed to submit an application via mail, online forms, or an office visit. A caseworker would further process the application by manually collecting data from different systems and assessing the application for eligibility. This process could take weeks, even if the application had no queries or errors.[21]

The program automated the data-transfer process within federal, state, and local agencies, eliminating the need for a parental application. A birth record triggers data transfers from the hospital to the central civil registry, the Ministry of Finance, and local tax offices, which then disburse allowances.[22] Within months of implementation, the Antragslose Familienbeihilfe program created massive value and efficiency improvements, with average processing time decreased to just two days, collectively saving 39,000 hours for citizens. Time savings internally in government was equal to 15 full-time employees.[23]

Similar life event–based approaches have blossomed worldwide, including in Singapore, the United Kingdom, Finland, India, Estonia, and the United States.[24] However, these approaches wouldn't work without advances in data integration and governance practices. Governments are moving beyond the days of unstructured, siloed, inaccessible data. Digital systems are increasingly freeing data from its traditional jurisdictional confines, making it available not only across government systems but also in machine-readable formats that can be integrated and ingested in large data analysis platforms.

In recent years, integrated data has had a profound impact on city operations. Real-time data from traffic systems, ongoing constructions, weather sensors, and other sources has been integrated to improve city management.[25] Cascais, a mid-sized city in Portugal, developed a cloud-based digital command center to manage city operations effectively. The city integrated data from various domains such as mobility, public infrastructure management, civic protection, emergency

Figure 1

By the numbers: Unleashing productivity in government

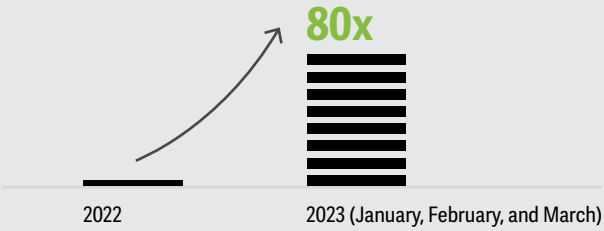
In the UK, the Tell Us Once life event–based principle reduced the number of times a citizen had to notify the death of a loved one to government.

Using robotic process automation in its application intake process, the US Food and Drug Administration's Center for Drug Evaluation and Research slashed processing time and manual effort.

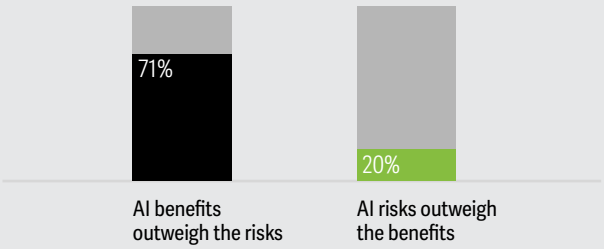
93%
reduction in application processing time

Estimated
5,200 hours
decrease in manual labor

Automating the scanning of tax forms helped the US Internal Revenue Service scan **80 times more returns** in the first three months of 2023 **than the whole of 2022**.



According to a survey of US federal leaders on the use of generative AI, AI benefits outweigh the risks by 71% and AI risks outweigh the benefits by 20%.



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management, waste management, and Internet of Things devices embedded across the city. Its smart waste management system optimized waste collection routes and times to reduce operational costs by 40% and energy costs by 20%.[26]

AI as a productivity accelerant

In recent years, agencies have embedded AI technologies into thousands of government systems and processes, often resulting in massive improvements in efficiency and productivity:

- In 2017, public hospitals in Queensland, Australia, introduced a tool to predict patient admissions, injury type, impact on bed availability, and staff vacations, helping forecast availability hours, weeks, or even years in advance. As a result, Queensland hospitals saved US$2.5 million a year, with improved patient outcomes benefiting the state as much as US$80 million annually.[27]

- The US Food and Drug Administration's Center for Drug Evaluation and Research used robotic process automation in its application intake process to slash application processing time by 93%, eliminating 5,200 hours of manual labor.[28]

- The Police Service of Northern Ireland has implemented more than two dozen AI-based automation solutions across several operational areas, including intelligence and public contact. The solutions have helped the service cut turnaround time from days to hours by fully automating low-complexity tasks while flagging complex tasks for staff review.[29]

The emergence of generative AI capabilities promises to accelerate productivity further. At a broader economic level, it is anticipated that large language models (LLMs) could affect at least 10% of tasks for four-fifths of American workers.[30] Globally, some experts predict that generative AI could boost the global gross domestic product by up to 7% and productivity growth by 1.5% over the course of the next decade.[31]

Generative AI–based tools have the potential to revolutionize how the public sector operates. By automating tedious, time-consuming, as well as many knowledge-based tasks, health care workers, child services caseworkers, defense and security analysts, embassy personnel, and other government employees will have more time to focus on high-value, intuitive, and creative work, including more time to interact with citizens.

However, a challenge for government technology leaders will be developing, testing, implementing, and quickly scaling potential generative AI applications. There is already a wide range of potential generative AI use cases that government leaders can prioritize. Government leaders are expected to initially prioritize applications that improve operational and planning areas (figure 2).

A southern state in the United States is developing one of the earliest generative AI application pilots at their state's managed care Medicaid program.[32] The Medicaid program is building upon its foundational digital infrastructure to explore generative AI applications. One such use case is a policy bot to help dozens of long-term services and supports staff to seek nuanced answers by sifting through hundreds of extensive guidelines and policy documents.[33]

The application aims to allow staff to quickly access these documents—including rules, waivers, and guidelines. For instance, if a staffer asks about a level of care criteria, the bot will, in seconds, scan the whole set of provided documents to provide contextual answers in plain English. Ideally, new employees would no longer need to spend extensive periods of time memorizing or researching these guidelines to find answers to such questions. The policy bot also helps capture some of the tacit knowledge in the organization that could be lost when a senior professional retires.[34]

The state Medicaid program leaders are already thinking about how to extend these capabilities to other areas. A digital assistant for workers could scan a client's history and eligibility to help summarize outcomes for more timely analysis. A natural language processing tool, coupled with an LLM, could help contact center workers with foreign language translations and summarization for more contextual responses. And a generative AIOps tool could help information technology system administrators scan through thousands of system performance alerts to proactively identify and escalate problems.[35]

Figure 2

Promising use cases to test generative AI applications

From automating mundane tasks to enhancing decision-making, here are some use cases or application areas being explored in the public sector.

Application area	Description
Operations and productivity	
Open-source assistant	Automate open-source intelligence reporting, including financial affairs, technology advancements, media assessments, and security briefings on a global scale.
Drafting contracts and statements of work	Analyze offerings from existing vendors, match an organizational need, generate proposals requests, and analyze the responses.
Onboarding caseworkers	Help caseworkers parse notes, analyze policy documents, and assess eligibility to propose interventions.
Planning and policymaking	
Stimulating urban planning scenarios	Assist urban planners in the ideation and design of novel urban concepts.
Policy creation assistant	Search large volumes of policy documents and output natural language responses to user queries in complex policy environments.
Summarizing legislative documents	Help legislative staff to quickly transcribe and summarize hearings, legislation, documents, and official announcements.
Service delivery and citizen engagement	
Virtual public servant	Develop virtual assistants that can provide personalized responses to citizen questions about public services.
Insights for all	Serve as an interface to help the public sector become insight-driven by making data more accessible.
Hyper-personalized education	Hyper-personalize digital teachers that can adapt to student learning needs and curricula.
Hyper-personalized education	Help with language translation to support delivering more inclusive services to citizens.

Source: Deloitte, "The generative AI dossier: A selection of high-impact use cases across six major industries," Deloitte AI Institute, accessed January 22, 2024.

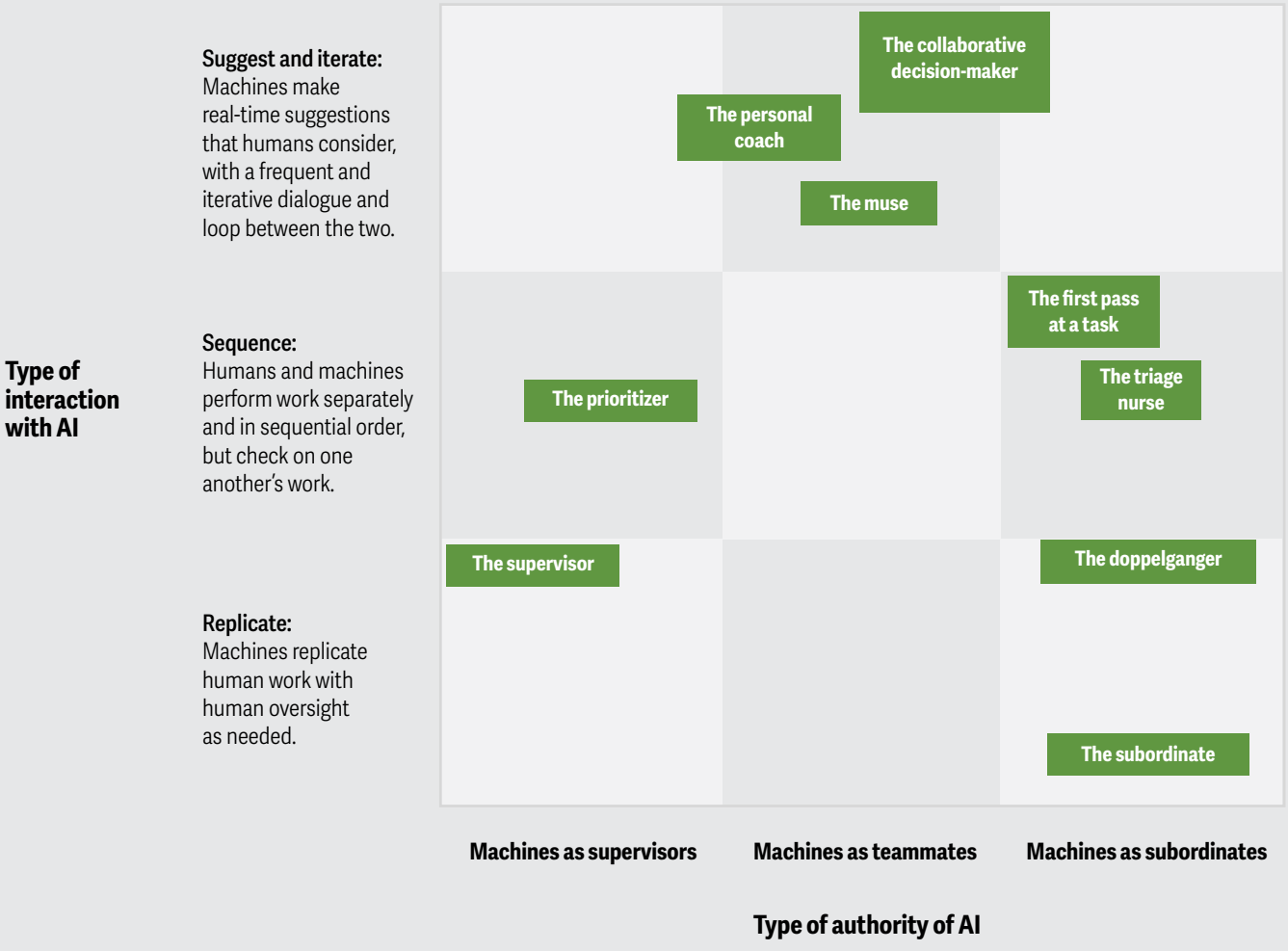
Getting ready for a new era of human-machine collaboration

Although technology can drive significant change, people continue to be the most valuable asset for most agencies. However, this creates two potential human capital problems: ineffective human-machine collaboration and the ongoing AI talent shortage in government.

The past decade's explosion of AI-powered tools has empowered public sector workers by automating routine work, allowing civil servants to focus on more complex, nuanced, and higher-order tasks. But with advances in AI technologies and the emergence of generative AI, these human-machine collaborations are set to become more intimate and valuable. There are many types of daily interactions workers can have with AI (figure 3), ranging from

Figure 3

Intensity of human-machine collaboration will depend on the type of task to be completed



Source: Sue Cantrell, Thomas H. Davenport, and Brad Kreit, "Strengthening the bonds of human and machine collaboration," *Deloitte Insights*, November 22, 2022.

directing AI applications to perform work (machines as subordinates) to working with AI in open-ended, iterative, and interactive ways over time in true partnership (machines as teammates) to allowing AI applications to help guide and direct work (machines as supervisors).[36]

Singapore was one of the first governments to launch a generative AI chatbot focused on serving 4,000 civil servants, with ambitions to extend it to the entire 150,000-strong public sector workforce. Singapore's Government Technology Agency developed the Pair chatbot to assist civil servants in writing, research, and coding.[37]

To better serve citizens, Singapore plans to replace its current "Ask Jamie" chatbot with a chat assistant informed by LLM engines.[38] The government has also updated its Data & AI Literacy ePrimer learning program for public officials to include content on generative AI, LLMs, prompt engineering, and limitations of LLMs.[39]

The increasing use of AI technologies in government will require a corresponding increase in tech talent. However, this presents a particular challenge, as many companies are also vying for the same skilled labor pool. Bridging the gap through training programs can be a solution. While agencies will need AI specialists, adopting AI at scale will require improving the data literacy skills of the workers who will be responsible for purchasing AI tools and services or utilizing AI applications to deliver services to citizens.[40]

The US government's recent executive order on AI[41] includes national AI talent recruiting in the federal government.[42] To boost the supply of digital talent, the US government has previously relied heavily on "tour of duty" programs,[43] including 18F at the General Services Administration, the US Digital Services, and the Presidential Innovation Fellows program. Such programs can close governments' talent gaps by creating opportunities for highly skilled professionals to contribute to public service.[44]

My take

Technology can help reimagine and improve census operations in Canada

Geoff Bowlby, director general, Census Program at Statistics Canada[45]

The internet response rate for census surveys is significantly higher in Canada than in other countries; yet refining online surveys has been a major focus for us at Statistics Canada. A major change we're testing and hoping to implement for the 2026 census involves allowing access to the internet response without a secure access code, a method already used in Australia, the United States, and the United Kingdom.

This approach still ensures security while simplifying access. Under the new system, if the access code provided through the mail or delivered by a Statistics Canada agent is lost or not received, respondents can enter their address on the main online response portal and securely generate an access code for them. Despite sounding simple, this change significantly alters our operations at the back end. More importantly, it improves the experience of citizens who currently have to call an often-overloaded Statistics Canada call center to get a secure access code.

Related to this, another technological development is aimed at individuals without a civic address, particularly those in rural areas. In such instances, if an address cannot be entered to generate a secure access code, respondents may be asked to pinpoint their dwelling on a map. This allows the respondent to complete their census online, and because Statistics Canada can associate the completed questionnaire with the dwelling on the map, follow-up by a Statistics Canada agent is avoided. Another application of geographic information system technology has been in agricultural surveys, where we use satellite imagery to measure crop yields and types instead of asking farmers questions.

We're also testing the introduction of a chatbot feature for field operations to support respondents. In 2021, we could not answer a large number of inbound calls to our call center because they were concentrated over a few days. The chatbot will allow for responses to common questions in natural language and in English and French. This, combined with providing a secure access code, will hopefully eliminate the issue of unanswered calls without increasing the number of call center employees.

We're also exploring safe and ethical AI applications in the census, particularly in the post-collection stages. AI can make operations more efficient, such as the automated coding of questionnaires. AI can also aid in first-level analysis of census data, spotting outliers and potential errors in aggregated data. Finally, to aid the public in understanding census data and eliminate the need for individuals to search for information, we're considering training an AI to answer questions using reference documents. These applications promise to enhance our operations, making them more efficient and user-friendly.

What the 10x future holds

- Learning time for new workers plummets, as they can retrieve policy and operational knowledge through generative AI, quickly checking historical data to understand what worked or did not in the past.
- Information-empowered citizens are able to check the performance of government programs, compare with other programs across jurisdictions, and provide more informed feedback to policymakers.
- Field workers are able to exercise greater informed discretion, as AI technologies enable quick access to information needed to make judgments; supervisors can review and evaluate these discretionary actions more holistically.
- Next-generation contact center experience with generative AI capabilities helps provide real-time AI translation, contextual understanding through shared data, and summaries of user options.

Steps governments can take now

- **Develop strong AI leadership** in government, similar to the digital and data leadership governments developed in the past two decades. This will be key to developing AI standards, a shared governance model, and making a stronger case for using AI in government.
- **Redefine AI strategy** for the generative AI era. Government AI and technology leaders should experiment and identify the most impactful use cases for the evolving tools and adjust workforce strategy to incorporate new skills into specific job roles and tasks. Agencies can develop policies and guidelines for how people should—and shouldn't—use the technology for specific applications and build trust by fostering a collaborative culture.
- **Focus on workforce experience**, as technology transformation, especially at this scale, can be challenging and could generate a culture backlash. Agencies should take a measured approach to skills training with programs designed around learners and smooth the transition by involving managers and frontline workers in designing or rolling out new tools. Also, they should analyze the positive impact of higher productivity on public sector wages and talent attraction and retention.
- **Create ethical guardrails** for new technologies to address privacy, security, hallucinations, ethics, and fair decision-making challenges.
- **Take a lead on generative AI development** by going beyond the role of user of the technology. Governments as buyers, regulators, and infrastructure providers can help catalyze the innovation ecosystem and accelerate AI entrepreneurship and economic growth.[46]

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Government's newfound agility

Governments are becoming agile across a range of areas including policymaking, regulation, technology development, procurement, and broader organizational agility.

Traditionally, and stereotypically, the public sector tends to move *slowly*. Numerous checks and balances, oversight, and caution are built into many systems. Personnel policies prioritize job security, meaning that agencies may struggle to hire and fire like private companies, which often results in companies being agile and nimble.

That's not to say that governments can't speed things up if necessary: When unprecedented events demand immediate action—the Pearl Harbor bombing, the 9/11 attacks, the COVID-19 pandemic—public sector leaders are able to come forward to quickly form working coalitions and programs. But often, after things get done, the agencies return to business as usual.

That slow pace is untenable. Crises today hardly pass before the *next* crisis arrives. Black swans that demand swift government intervention are no longer uncommon, with risks—arising from geopolitical conflicts, health emergencies, natural disasters, energy crises, fragile supply chains, and fractious trade relationships—ever more complex and uncertain. Agencies can likely no longer operate on deliberately paced timelines anymore, staying within organizational boundaries.

Government leaders have recognized a new imperative: the need for a responsive, adaptive, and flexible model. *Agile government* can be that model.[1]

Agile is hardly a new business concept, and its philosophy of flexibility and feedback-based iteration has moved far beyond its origins in software development.[2] Over the last several years, government agencies worldwide have taken note, using agile approaches in procurement, regulation, policymaking, workforce deployment, funding, and even constructing physical infrastructure to achieve 10x change.[3] It's a small step to broadly applying agile thinking to government's focus on mission delivery.

Breaking trade-offs

Agile is happening: Around the world, governments are abandoning traditional processes and using more flexible, iterative approaches to service delivery and decision-making. But in adopting agility, agency leaders face unique challenges and trade-offs. The urgency of agile decision-making inevitably clashes with the necessity for thorough and deliberative processes; rigid accountability systems that aim to ensure transparency and adherence to rules can hinder flexibility. But that doesn't mean accountability failures need be the price of agility.

Embracing a "two-gear government" model fosters agility by simultaneously optimizing existing services and operations while innovating for the future.[4] This dual-focus approach can enable agencies to swiftly respond to evolving challenges and reimagine their workflows and processes. And it asks governments to challenge traditional orthodoxies of how regulations are enacted, services are procured, funding is allocated, and the workforce is hired and deployed.

Convergence: The key to 10x improvement in agility

Agencies are striving for a significant 10x boost in agility and achieving that involves a multifaceted approach. This involves rethinking processes, adopting flexible talent models, and creating innovative regulatory frameworks. Investing in new technologies can help agencies build the capability and capacity to respond rapidly to changing circumstances such as a sudden increase in demand for public services, though tech alone is insufficient. For example, during the pandemic, when many agencies rolled out direct cash transfer programs, embracing digital technologies was only one factor in ensuring money was deposited in bank accounts. The programs would not have functioned without parallel changes in regulation, collaboration with private and public sector entities, eligibility criteria relaxation, and newly hired contract workers helping applicants file for claims.

Put simply, the path to a 10x improvement in agility involves a holistic approach. It's a coordinated effort where regulatory adjustments, collaboration, and workforce innovations complement technological advancements. Consider how combining different tools might have tangible impacts on the agility of agencies:

- Agile culture + network mindset + shared governance + foresight capabilities = Faster response to a crisis
- Data-sharing + feedback loops + soft laws + foresight capabilities and scenario analysis = Adaptive regulation

Trend in action

Making 10x agility improvements requires combining the power of multiple tools—tools that are being applied in a variety of government domains and functions, including organizational agility, agile software development, agile procurement, and agile regulation and policymaking.

Organizational agility

An agile organization functions like a fluid network in which funding, staffing, policies, and processes flow and adapt as needed. Such organizations are driven by a fast, flexible, and collaborative operating model capable of learning and adapting to changing needs and environments.[5] Before June 2023, few may have described the state government of Pennsylvania as an agile organization, but its work to reopen a collapsed bridge in only 12 days argues for that characterization.[6]

When a truck carrying 8,500 gallons of flammable liquid overturned outside of Philadelphia, the resulting fire melted an overpass bridge on Interstate 95, a major regional route.[7] The site crossed an 86-inch sewer line that could not bear the weight of a traditional dirt infill, and officials feared repairs would take months.[8] But engineers quickly decided not to rebuild the six-lane bridge from scratch, opting instead to use a glass aggregate filler to build up the foundation underlying a temporary overpass. Thus began a public-private effort that allowed the construction of a fully functioning temporary bridge through a flexible and collaborative governance process, flexible funding mechanisms, and an agile workforce.[9]

Agile resourcing. The Pennsylvania Department of Transportation shifted equipment from a nearby project to begin demolition. Using local knowledge, builders identified a foam glass aggregate plant that produced lightweight filler. Union workers labored around the clock. When rain threatened to delay construction, the National Association for Stock Car Auto Racing, LLC loaned a jet dryer from Pocono Raceway, 95 miles north.[10]

Breaking down barriers to improve outcomes. Governor Josh Shapiro authorized the transfer of US$7 million in available funds to the Pennsylvania Emergency Management Agency, providing a flexible

Figure 1

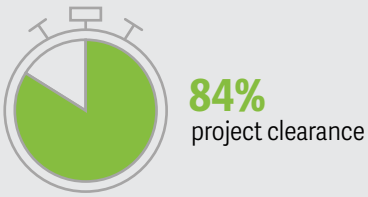
By the numbers: Government's newfound agility

Agile development: The Dutch Tax and Customs Administration implemented agile methodologies to **speed up** delivery of **new software releases** by 3x.

Organizational agility: **JIGSAW**, a **fuel-planning application** developed by an agile organization within US Airforce, resulted in a **savings of US$500 million**.

Agile procurement: India's **Government e-Marketplace** has facilitated savings of over US$5.4 billion, thanks to **innovative procurement strategies** like exchanging outdated products with new ones for additional discounts.

Agile regulation: The **on-time decisions** in **granting environmental clearances** for projects in Australia improved from 21% in December 2019 to 84% in December 2023.



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financial foundation to address evolving needs. The US Department of Transportation released an additional US$3 million to get the repairs started, buying time to pull together full funding.[11] State agencies were also granted the authority to employ emergency procurement procedures, streamlining the acquisition of essential supplies and services. A focused effort on breaking down barriers produced results. "We fast-tracked the permitting process to avoid delays while maintaining safety standards," Shapiro said, "relying on our experience with past permitting processes as well as the expertise of engineers and other professionals."[12]

Regulatory agility. Shapiro cut permitting and procurement red tape that would have delayed the critical project.[13] The flexibility extended to the suspension of regulatory statutes and procedural formalities, allowing state agencies to swiftly implement emergency assignments.

Developing a culture of agile leadership. Agile leaders adapt their approaches as needed, focusing on results. Rather than hoard authority, good leaders give responsibility. "No one had to check with headquarters to keep the project moving," Shapiro said. "The construction site *was* headquarters."[14]

Agile funding and agile software development

In February 2001, at a Utah ski resort,[15] 17 software developers, programmers, scientists, and authors came together to find common ground on an alternative to "documentation driven" software development practices and emerged with "a manifesto for agile software development."[16] In the more than two decades since, companies have applied agile principles to a wide range of processes, and agencies have followed suit. But government faces unique challenges in adopting an agile approach, particularly in budgeting and funding processes.

The traditional annual funding process favors large-scale, omnibus projects evaluated upon completion, very much in contrast to agile's focus on continuous and incremental testing of value delivered through minimum viable products, with resources realigned and reallocated based on outcomes and changing needs.

The federal government launched the Technology Modernization Fund (TMF) in 2018, aiming to change the way the government funds IT modernization projects. As in agile software development, funding is tied to the completion of milestones.[17]

The TMF emphasizes an iterative approach to system development. The fund structure allows agencies to implement multi-year projects in an agile manner and de-risk projects from the vagaries of fiscal-year funding models that require annual approval of each multi-year project. The TMF also helps enable agencies to request funding to adapt to the fast pace of changing technology needs, and outcome-based funding allows agencies to review and course-correct technology development throughout each project, mitigating the risk of costly failures.[18]

In 2021, in the middle of the pandemic, the fund's broad mandate and flexible model allowed it to pivot resources to new types of projects.[19] An additional US$1 billion of federal funding helped strengthen cyberdefense in the wake of high-profile ransomware attacks and modernize technology during the pandemic.[20] The TMF has invested in 47 IT projects so far, 36 of which were through the American Rescue Plan Act of 2021, aimed at addressing urgent IT modernization needs.[21]

The TMF has also allocated funds to agencies that hold sensitive data related to foreign aid, health care, and US employment. It allocated US$18 million to the US Department of Health and Human Services to protect public health information against increasing cyberattacks on critical infrastructure. Similarly, the fund granted US$15.2 million to the US Department of Labor to protect its digital assets from cyber threats.[22]

In December 2021, Guy Cavallo, US Office of Personnel Management's chief information officer, highlighted the importance of the TMF funding for addressing pressing needs. "I can't wait to go back to the Hill and ask for additional appropriations in FY2024 if I need to do something now," he explained, noting that "the TMF funding allows an agency to take on a modernization task now, versus if they go through traditional appropriations, you're gonna have to wait a couple of appropriation cycles before that money even shows up."

Cavallo added: "If we have to do it with our own funding, this could take me three or four years. Let's apply for [TMF] funding now and get this knocked out in the next 18 months."[23]

TMF funding also was allocated to the US General Services Administration (GSA), which faced the challenge of modernizing 88 database applications whose outdated technology and user interfaces didn't easily integrate with other systems. Reliance on annual fiscal funding would have forced the GSA to take a piecemeal approach to tackling the transformational project.[24] The TMF awarded US$7.8 million to the GSA in 2018, and the agency elected to implement agile methodology to modernize its applications. This also allowed the GSA to leverage existing multi-year contracts without worrying about contract renewals.

To execute the project, the agency put up a cross-functional team of 20 members from diverse business lines rather than relying on a dedicated IT team.[25] The cross-functional team had to not only modernize legacy systems but also actually flip years of orthodoxies about business processes, replacing those long-established processes with agile and iterative ways of working by introducing a mindset of collaboration and continuous development.[26]

The team's cross-functional nature brought collaboration to the fore. Team members from the US Office of Technology provided project management support and interfaced with the US Office of Management and Budget and the TMF board to keep them apprised of the project. The rest of the team focused on the software development and user experience, working in tandem on two-week sprint cycles and tracking work activities using a project management tool. To take stock of ongoing sprints, sub-teams met weekly to coordinate activities and assess dependencies; the development team met biweekly to coordinate with teams providing core IT services.[27]

The modernization helped GSA achieve not only agility in its technology systems but also an agile way of working. The team took the next step and created a playbook for all agencies on how to move database applications to propagate agile methodologies and establish repeatable processes to modernize legacy applications.[28]

Agile procurement

Traditional government procurement processes can be onerous: providing detailed specifications, releasing a request for proposal, selecting a vendor, and waiting patiently for the vendor to deliver a solution. "It takes around three years to create requirements and another two to purchase solutions," explained Alex Benay, Canada's former CIO.[29] Agile procurement aims to boost speed and efficiency by working iteratively with vendors on prototypes. The process eschews detailed prescriptive requirements to make room for innovation by including flexibility on how outcomes are achieved.

The US Department of Homeland Security (DHS) launched the Procurement Innovation Lab in 2015 to experiment and test innovative, faster procurement approaches, embracing agile methodology and risk-taking. The lab has awarded more than 125 procurement projects and has started training procurement officers in other federal agencies.[30]

The lab helped the US Food and Drug Administration (FDA) double the speed of a procurement contract by cutting the days to award a contract from 180 days to 94 days. [31]

The FDA sought help to design, develop, and maintain applications. In phase one, it asked 19 interested vendors to submit a five-page prior experience write-up. After review of the write-ups, four vendors were selected to proceed to phase two—all this was completed within a week's time. In the second phase, two weeks after the first, vendors provided one-hour oral presentations to discuss technical solutions and pricing. Shortlisting at stage 1 helped the FDA reduce the number of proposals requiring comprehensive evaluation from 19 to four. After the award, the team also conducted debriefs with unsuccessful bidders, resulting in zero protests.[32]

In its ninth year, the lab aims to promote innovative procurement practices across the federal government; to date, it has conducted more than 80 boot camps to train over 5,000 DHS and governmentwide procurement officials. In fiscal year 2021, the lab also rolled out a series of 10-minute micro training sessions on specific procurement innovation topics.[33]

Similar innovations in procurement are taking place at the local government level. To select a high-ticket contract life cycle management system, the Dunedin City Council in New Zealand streamlined procurement, using a lean agile process to cut the timeline from three months to only three days.[34] The council quickly shortlisted three vendors and organized a "big room" event, at which the council presented challenges and allowed vendors to talk through their solutions. The vendor presentations allowed the council members to assess the various approaches to solving challenges and the capabilities and features of the vendors' proposed systems.[35] The council selected the winning vendor at the end of day two.[36]

Agile regulation and policymaking

With complexity and unpredictability increasingly part of the decision-making process, policymakers need new tools and novel regulatory approaches to explore scenarios and weigh policy options. Foresight and scenario analysis enables policymakers to understand emerging trends and identify future risks, allowing them to consider new policies to help mitigate these risks.

The United Kingdom Department for Work and Pensions, responsible for the nation's welfare, pension, and child care policy, uses a policy simulation model (PSM) to understand the costs of policy options and the impact of policy changes on claimants' income and poverty. The tool integrates a wide range of policy data, administrative data, and tax rules with assumptions such as weekly hours worked and minimum wages. The PSM's findings helped department leaders decide to move to a universal credit system, replacing six existing benefit programs. The model considered projected economic and demographic shifts and compared the benefits of introducing the universal credit system on work incentives and poverty.[37] The PSM model was used to make tweaks in the universal credit to lower the taper rate—that is, the rate at which benefits are reduced as earnings rise.[38]

Ireland has also developed a simulation tool for policymaking, using data from patents, knowledge flows, and national economic data to model how investors and corporations might react to various government policies. With regional economic data and sector information, officials can simulate policies' effect before rolling them out in the real world.[39]

Such foresight or simulation can never be 100% accurate, but greater agility can compensate for less accurate foresight: Lessons learned from prototypes, pilots, sandbox exercises, and staged rollouts can be used to fine-tune policies before they are adopted at scale. Such agile approaches to regulation rely on trial and error and the codesign of regulation and standards. The result: They have faster feedback loops, enabling them to respond to innovations and disruptions more swiftly.[40]

ZOMBIE IDEAS

Zombie ideas are ingrained policy ideas or practices that can impede adaptability, causing agencies to follow traditional methods that hinder agility. The rapidly changing environment demands a paradigm shift in favor of agile governance. Governments can work to navigate challenges and ensure resilience and responsiveness. However, agility alone does not protect organizations and policymakers from entrenched and orthodox beliefs. Simply speeding up processes or implementing agile frameworks risks perpetuating outdated paradigms and undermining genuine innovation and responsiveness.[41]

As a result, embracing agility generally requires a dual commitment: implementing agile methodologies while also questioning and challenging underlying ideologies and assumptions. True agility goes beyond speeding up processes, constantly challenging orthodoxies, and zombie ideas.

My take

The case for shared and end-to-end policy infrastructure for adaptive policymaking

Pia Andrews, A serial public sector reformer with experience of working with governments in Australia, Canada, and New Zealand[42]

The term "policy infrastructure" is not a commonly used term in government discourse, but policymakers and those who implement policies rely on it almost every day. Policy infrastructure involves the data, tools, and platforms that assist governments in managing policies throughout their life cycle, from design to implementation and monitoring for continuous improvement.

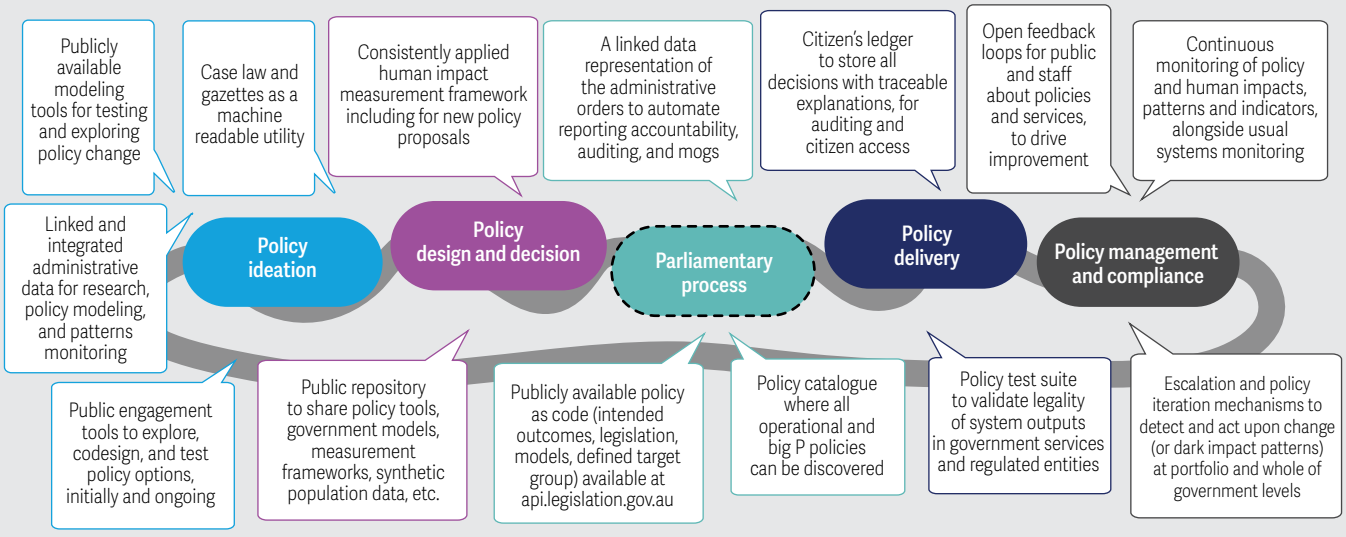
The current approach to policy infrastructure is often fragmented and inconsistently applied, as different actors create, update, implement, and evaluate policies with different tools. The lack of shared or common policy infrastructure leads to different interpretations by different actors, causing significant gaps between policy design and delivery in the real-world and an inability to effectively and continuously optimize policy outcomes over time.

In the ideal shared and end-to-end policy infrastructure approach (figure 2), all the actors involved have the same modeling tools, policy twins, monitoring tools, and feedback loops. The shared infrastructure could also be open to the public, promoting transparency and allowing for alternative modeling and testing of policy options.

Figure 2

All the actors involved in an ideal and end-to-end policy infrastructure approach have the same modeling tools, policy twins, monitoring tools, and feedback loops

Policy infrastructure concept model



Source: Pia Andrews, "The case for shared & end-to-end policy infrastructure," pipka.org, December 5, 2023.

One intriguing aspect of policy infrastructure is the concept of policy twins. These digital representations of policies, including legislation as code, policy test suites and relevant data, could help bridge the gap between policy design and policy delivery with a shared reference implementation of policy. This could enable a more test-driven approach to policy, legislative and regulatory drafting, and help identify unintended impacts over the whole life of the policy. They also help delivery departments and regulators to monitor for how the policy rules are used in reality, and gather feedback to make necessary changes in policy implementation to continually maximize intended outcomes.

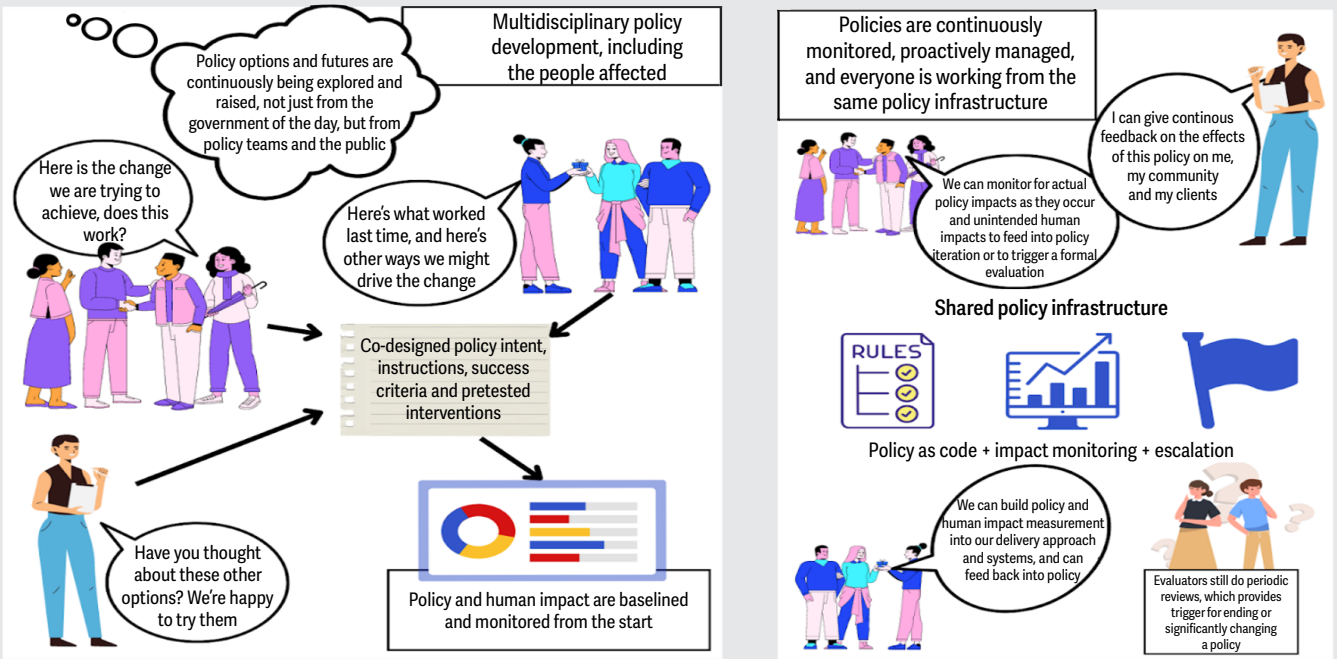
Policy infrastructure could be complemented with a modern and adaptive policy management model (figure 2), drawing inspiration from the techniques and methods used in product management and continuous integration and continuous delivery pipelines (a process that automates the software delivery process) to operationalize policy agility. In a policy journey map, each policy could have a policy manager responsible for the end-to-end outcome realization across all interventions, while each policy intervention might have a policy product owner responsible for its delivery. This can provide the ability to dial up or down individual interventions according to their efficacy and performance.

Policy infrastructure and adaptive policy management could ensure that interventions are effective, complementary, and can continuously adapt to maximize policy outcomes while mitigating unintended impacts. Governments can transform to achieve more adaptive and effective operating models and support systems to deliver policy outcomes by embracing a strategic and proactive approach to **modernizing policy infrastructure and management**.

Figure 3

A policy infrastructure needs to be complemented with a modern, adaptive, and end-to-end policy management model

End-to-end and adaptive policy management



Source: Pia Andrews, "The case for adaptive and end-to-end policy management," pipka.org, November 23, 2023.

What the 10x future holds

Embed foresight practices: Foresight helps improve agility by increasing lead times to adapt to changes. Scenario analysis and policy simulations can allow officials to peep into the future and consider potential impacts of policies before enacting them.

Leverage emerging technologies such as generative artificial intelligence: From using gen AI to generate documents and reports to having machine learning predict demand, AI can help reduce the time needed to create and process procurement requests. Similarly, gen AI can help transcribe legislative meetings and quickly develop summaries of existing policies to help avoid duplicative legislation.

Simulate with technology: A combination of AI and digital twin technology can allow governments to simulate proposed infrastructure projects and anticipate reaction. Simulation can also help agencies to iterate their approach to policymaking and service delivery and avoid costly failures.

Rise of innovative funding mechanisms: Incremental funding tied to outcomes and shared funding that enable agencies to collaborate between other agencies and levels of government can introduce more agility into government operations.

Steps you can take now

Creating avenues for experimentation: Create sandboxes, policy labs, and innovation spaces to develop and procure technology act as dedicated experimentation units for agency workforces.

Building a broader ecosystem: Form alliances and partnerships with external stakeholders to bring innovative practices into government operations and explore tapping into gig workers for flexible and agile hiring strategies.

Building flexibility into processes: Take greater advantage of soft laws, such as guidelines and codes of conduct, to provide more flexibility and respond faster to disruptive changes.

Inculcating a culture of agility: Foster an agile mindset within agencies, prioritizing outcomes for citizens and businesses over rigid processes. Establish faster feedback loops to enhance responsiveness and adaptability to changing circumstances.

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Nurturing ecosystems to supercharge innovation

Transformational innovations are already shaping the future. Governments can help ensure they address today's most pressing needs by aligning interests within innovation ecosystems.

Innovation builds on innovation. The automobile industry sprang to vibrancy thanks in part to other inventions: refining standard grades of gasoline, the invention of the assembly line, and even vehicle safety systems. Now the automobile itself is a component of complex systems of global trade, and emissions from a thriving commercial automobile industry contribute to climate change.[1] System-of-system challenges, like climate change, are so complex that successfully tackling them often requires systemwide innovations. Change on such an unprecedented scale calls for understanding complex ecosystems and developing new ecosystems to encourage the development of goal technologies just as highways and suburbs helped encourage the development of automobiles.

According to the International Energy Agency, eliminating carbon dioxide emissions from the planet by 2050 will require technologies that are currently in their nascent stages.[2] Yet, these technologies are progressing. Sustained support from the public sector has spurred innovation in renewable energy development, rendering it more economically viable than traditional sources like fossil fuels.[3] Wind and solar power have now emerged as the world's fastest-growing energy sources, collectively contributing 12% to global electricity generation in 2023.[4]

Driving innovation to address complex problems isn't simple. It typically requires influencing an interconnected ecosystem of disparate parties. Renewable energy systems, for example, can grow from the aligned efforts of domestic and international private sector companies, governments, research institutions, and consumers. Yet, complexity, as frustrating as it may be to research and manage, can have its benefits. Some of the best innovations emerge from the intersections of diverse perspectives.

Without leadership, managing complex, multiplayer ecosystems can be difficult to impossible. Incentives, resources, motivations, and abilities can all differ among stakeholders. Despite the growing complexity of the ecosystems producing innovation, governments often remain a central force because of their ability to lead.

As a result, some governments around the world are beginning to deploy the tools needed to not just create one innovation, but also catalyze a whole ecosystem to create 10x innovation.

The critical advantages of an innovation ecosystem became evident in 2020: The world, grappling with the COVID-19 pandemic, needed a vaccine. The US government's Accelerating COVID-19 Therapeutic

Interventions and Vaccines (ACTIV) initiative brought together federal agencies, pharmaceutical companies, academia, international agencies, and philanthropic entities. It developed vaccines in record time, thanks in part to predefined incentives and collaboration mandates.[5] Innovation ecosystems are also helping nations gain strategic advantages. In the United States and Europe, government policies like the US or EU Chips Act are driving investment and industry transformation to help create markets for critical technology.

By leading innovation ecosystems, governments can help drive innovation at great scale and work to match today's most pressing needs.

Breaking trade-offs

Historically, government often held a central role in seeding innovation, either directly through its own research and development or by targeted funding of R&D. Government-initiated projects, like GPS or the internet, often acted as innovation seeds, sprouting new life within industry.

The traditional linear path of innovation from government to academia and industry tends to be less viable today. The diminishing share of public sector R&D, when compared to the private sector, means that, often, industry seeds more innovation than government. The solutions required to address many contemporary challenges, such as climate change, pull on a complex tapestry of technology woven together across industries, governments, and communities, which can make it more difficult for government to direct.

To foster innovation at scale, one possible use of government's authority and resources is to convene a diverse network of problem solvers. Some governments are beginning to focus their efforts on ways that can shape innovation ecosystems. By understanding and aligning stakeholder incentives spanning industry, academia, and the public sector, and establishing optimal conditions for greater collaboration, governments may be able to take advantage of complexity rather than suffer from it.

The shift from driving specific innovations to driving the ecosystems that create them can enable governments to catalyze innovation at scale.

Convergence: A key to 10x improvement in innovation

Achieving 10x advancements in innovation requires more than just establishing public-private ecosystems; it demands the dedicated nurturing of those ecosystems. This nurturing process likely hinges on public sector leaders taking proactive measures to align stakeholder incentives, thereby fostering optimal conditions for collaborative endeavors.

Governments are reimagining processes, implementing policy changes, and exploring various pathways to partnership. This can help them build and nurture collaborative, public-private ecosystems. Among other measures, governments are offering a range of incentives to the private sector, such as innovation challenges, subsidies, tax breaks, streamlining the regulatory landscape, and proactively sharing data and technical knowledge.

Essentially, the key to 10x improvement in innovation may lie in the public sector's ability to converge the varied interests within a diverse ecosystem, steering them toward a common goal. Combining different tools can help governments align diverse stakeholder incentives:

- Ecosystem mapping + network mindset + regulatory adjustments + evidence-based policymaking = Creating optimal conditions for change
- Data-sharing + shared funding + incentives + cultural adjustments = Influencing stakeholder behavior

Trend in action

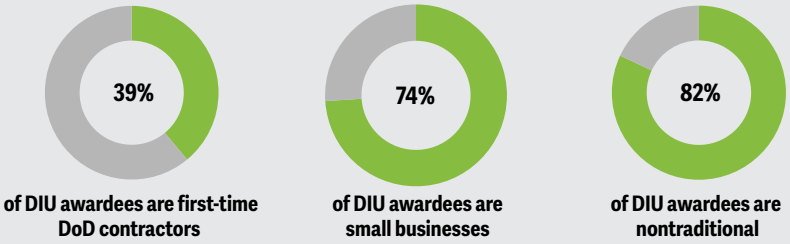
Recognizing that many of today's most pressing challenges often require new approaches, governments can rethink innovation through three main pathways:

- Shaping and working through complex ecosystems
- Understanding and incentivizing shared goals
- Setting the conditions for innovation through programs and policies

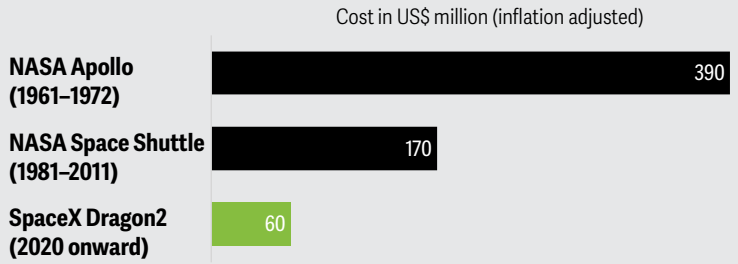
Figure 1

By the numbers: Nurturing ecosystems to supercharge innovation

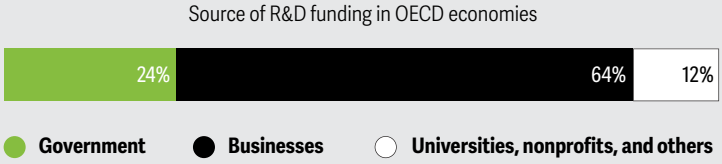
The United States Department of Defense (DoD) established a specialized acquisition unit, the Defense Innovation Unit (DIU), to diversify its vendor ecosystem.



Private sector participation has significantly brought down the average cost per seat for astronauts on spacecrafts.



Globally, commercial research and development spending has eclipsed government levels by orders of magnitude.



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Shaping and working through complex ecosystems

Often dubbed the challenge of our collective lifetimes, addressing climate change surpasses the capacity of any single government agency working in isolation. A collaborative ecosystem of problem-solvers from the public sector, private sector, academia, and civil groups, channeling resources and sharing ideas, might be the best way to address a warming climate.

Denmark has announced plans to reduce its greenhouse gas emissions to 70% of 1990 levels by 2030, ultimately aiming for net-zero emissions by 2050.[6] Recognizing that achieving these goals necessitated a large-scale and

diverse array of solutions from the private sector, the Danish government divided the Danish economy into 14 sectors and invited each sector to develop industry-specific climate partnerships.[7] These partnerships spanned the entirety of the private sector, encompassing fields from construction and commerce to agriculture to finance.

The invitation carried a responsibility. Each partnership was tasked with presenting a proposal outlining how their particular sector could contribute to achieving the national objective of a 70% reduction in greenhouse gas emissions by 2030.[8]

The proposals from the partnerships were also required to incorporate tangible recommendations for the government on how to support and facilitate each industry's suggested green initiatives.[9] It represented a green road map for the private sector crafted by the industries themselves.

While each partnership approached the process differently, each engaged in co-creation. Partnerships gathered insights from academia, relevant ministries, civil society, and each other.[10] Ultimately, in March 2020, 14 climate partnerships submitted their proposals to the government, totaling 432 recommendations.[11]

As of 2023, approximately 80% of these recommendations have been either fully or partially implemented.[12] As of 2021, Denmark has cut its annual carbon dioxide emissions by almost half—53.58 million tons in 1990 compared to 29.58 million tons in 2021.[13] In 1990, Denmark represented 0.24% of global carbon dioxide emissions, compared to 0.08% in 2021. Denmark has been ranked the world's most sustainable country two years in a row.[14] Denmark is on its way to reach its climate goals in part because it engaged a dynamic ecosystem.

Understanding and incentivizing shared goals

Working through partners can be hard. Each player in an ecosystem has different incentives and fears. But embracing that messiness and understanding what drives each participant can help government leaders select interventions that will integrate with, not work against, a particular ecosystem.

Economies can be a good example of complex ecosystems where conflicting incentives can stymie government efforts. Indeed, companies themselves are a hodgepodge of incentives, each occurring in different situations, aiming to serve varied consumer goals. Driving economic change thus requires understanding how to direct interventions that serve groups with divergent needs.

The government of Georgia generated economic growth by studying its own financial ecosystem. It surveyed banks, businesses, asset managers, and the public, to learn about the incentives driving relevant portions of the banking and financial sector.[15] With an understanding of that ecosystem, Georgia was able to implement several changes to create more modern, flexible capital markets. These changes included industry advocacy efforts, new regulations and debt programs, and tax incentives, which have helped drive investment into the country and broaden economic growth.[16]

From 2015, when Georgia first began the effort, to 2020, when Georgia implemented the new plan, Georgia's GDP hovered around US$15 billion.[17] From 2020 to 2022, Georgia's GDP grew to US$24 billion.[18] A key part of that growth was attracting foreign direct investment (FDI). FDI from the European Union in Georgia increased 142% between 2021 and 2022.[19] Overall, 2022 was a record year of FDI in Georgia, reaching US$2 billion—a 61% increase from 2021.[20]

Understanding the complex tapestry of incentives and interventions can be helpful for accessing existing innovations. An enduring challenge for militaries around the world is managing conflicting incentives between private contractors and the military. Militaries often work on longer procurement timelines and with more processes than a commercial company, which can contribute to making collaboration difficult—and costly. Often, slow procurement can mean slower innovation.

Some governments have begun setting up specific organizations, like the United States' Defense Innovation Unit (DIU) or the United Kingdom's jHub, to help militaries understand industry incentives and find tools to accommodate them. Both organizations have **taken approaches** to help ease collaboration between the military and commercial sector, like adopting new purchasing models, colocating in areas of tech innovation, and adopting organizational cultures that more closely resemble their

commercial partners. Through their interventions, they've funneled billions of dollars to the private sector for important military innovation.

Since its creation in 2016, DIU has received more than 5,000 commercial proposals, transferred 52 commercial solutions to the Department of Defense, completed 57 projects through prototyping (of 157 prototype projects started), leveraged US$30 billion in private investment, and awarded US$4.9 billion in defense contracts to commercial companies.[21] Eighty-two percent of the awards DIU has granted went to nontraditional defense companies—of the 82%, 39% were first-time Department of Defense vendors.[22] DIU's work has been focused on areas key to system solutions, including artificial intelligence and machine learning, autonomy, cyber, energy, human systems, and space.

Improving collaboration doesn't necessarily require creating new organizations—simpler changes can help too. Changes to how militaries solicit products or solutions from industry can impact how a military encourages cooperation. If militaries used "statements of objectives" rather than "statements of work" to seek industry solutions, they could encourage industry to develop innovative ways of achieving desired outcomes while encouraging cooperation with more potential partners. Or, when procurement officers consider a broader scope of industry past performance (for example, commercial and government past performance), they can expand the aperture of possible solutions and providers, compared to if they only consider government past performance.

Setting the conditions for innovation through programs and policies

Developing and scaling innovation often requires government leaders to go beyond the perennial quest for one magic intervention and instead focus on finding the right set of interventions that will establish conditions for creativity.

For decades, the National Aeronautics and Space Administration (NASA) has fostered a network of commercial entities to whom it articulates its requirements. In turn, the ecosystem delivers by designing, constructing, and managing services for NASA. While the benefits to NASA are important, the broader space industry has benefited substantially as well (figure 2).

As part of NASA's Commercial Crew Program, commercial companies received billions in funding and support to develop spacecraft to carry astronauts to the International Space Station (ISS).[23] NASA not only saved billions of dollars in development costs, but with the cheaper technology that was developed, the space agency also saves money on each mission to the ISS.[24]

NASA pays approximately US$55 million per seat to send astronauts to the ISS aboard SpaceX's (a member of the Commercial Crew Program) Crew Dragon spacecraft, compared to US$90 million for a seat on Russia's Soyuz system, or US$170 million per seat for the US Space Shuttle—the only other spacecraft to take astronauts to the ISS.[25]

The program also helped to accelerate the development of important space industry innovations like reusable rockets. The follow-on impact of more affordable launch costs from the commercial space-launch sector have been significant.[26] Indeed, through the Commercial Crew program, NASA tripped an important domino that helped accelerate the growth of the commercial space industry.

NASA is building on the success of its Commercial Crew Program with its Commercial Destinations in Low Earth Orbit program. Just as more affordable launches led to innovation and industry growth, commercial destinations in low Earth orbit are expected to do the same.[27]

Like Commercial Crew, the Destinations program provides funding for corporations to develop commercially owned and operated destinations in low earth orbit from which NASA and others can purchase services.[28] While the impact of the destination program is ongoing, it has already accelerated private sector funding into development of private sector space stations.[29]

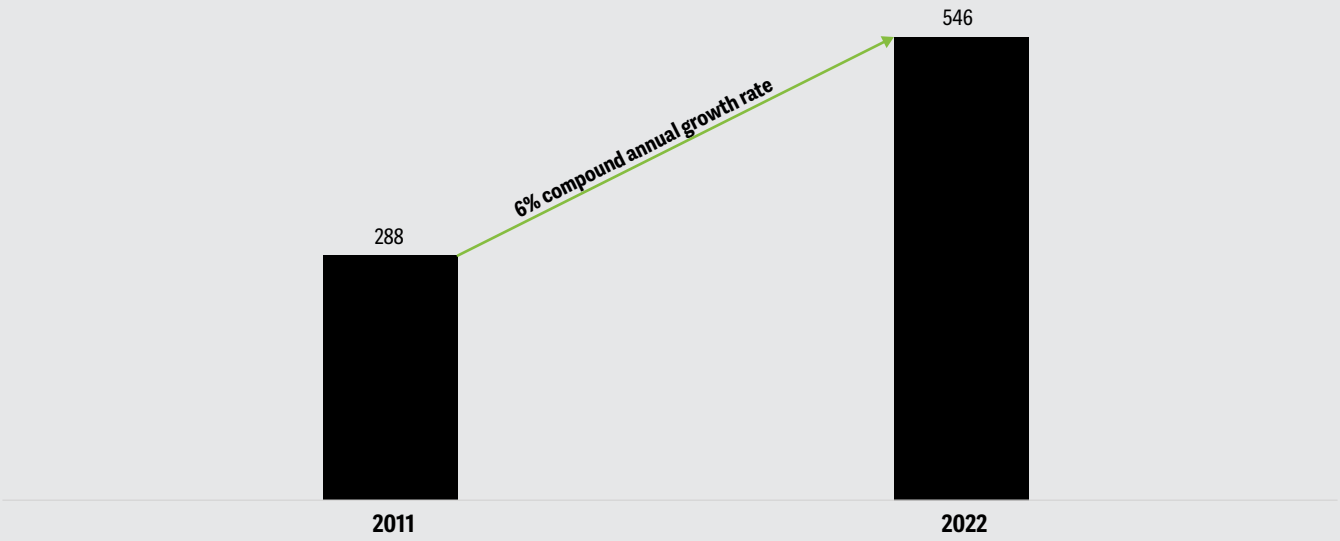
Both examples demonstrate the value of government setting the conditions for innovation rather than attempting to be the sole source of it. Over decades, NASA's guidance, policy changes, and interventions have produced innovations that fundamentally changed our daily lives, including OpenStack software, the computer mouse, and cordless drills.

Setting the conditions for high-impact innovation doesn't necessarily require funding specific programs.

Figure 2

Continuous collaboration between national space agencies like NASA and commercial firms has significantly enhanced the capability and capacity of the broader space industry

Global space economy (US$ billion)



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The request can be more open-ended, like with Impact Canada, a governmentwide effort to bring innovations to government via challenges and creative funding approaches.[30] One component of the effort is outcome-based challenges. The government pays funds not for development, but when a team achieves the stated goals.

Impact Canada uses evidence-based methodologies to identify problems, assess interventions, and scale solutions.[31] Focus areas include economic, environmental, and social issues.

Impact Canada has more than doubled the number of funded projects—growing in five years from two innovation pathways valued at US$375 million to more than 30 pathways valued over US$735 million.[32] Program successes include a safer law enforcement tool for testing illegal drugs, more energy-efficient mining technology, novel bio jet fuel, and safe, transitional, emergency housing solutions for people escaping violence.[33] The program has encouraged innovation beyond program challenge winners. Ninety percent of program applicants are still advancing their solutions outside of the program through additional R&D, prototype development, and new businesses.[34]

My take

Scaling innovation requires a pathway

Monica Alderette, Space Systems Command Front Door program manager, United States Space Force[35]

Today's innovation ecosystem is not what it used to be. Industry drives as much or more innovation today as government. So, when Space Systems Command (SSC), the US Space Force field command responsible for delivering resilient capabilities to protect our nation's strategic advantage in, from, and to space, was charged with finding and growing new innovations for 11 key mission areas, we knew we needed to develop an effective pathway between industry and the Space Force.

Key to a new, effective pathway was addressing the challenges that stem from different operating models among Department of Defense, government, and private sector organizations. Due to the differences between procurement processes and budgeting cycles, as well as numerous other nuances, Department of Defense and industry collaboration can require education, trust, and a wealth of bilateral communication. If those requirements become too burdensome for industry, commercial partners become discouraged from engaging with the government. When government and industry can't work together, it's as if innovations sit separated by a metaphorical wall constructed out of the differences between military and private sector ecosystems.

Our solution: Create a door. A "Front Door" to establish a pathway between SSC and the private sector that makes it easy for SSC and industry to communicate, collaborate, develop trust, and learn from one another.

Front Door provides the commercial space enterprise with a streamlined user experience for approaching SSC with technology or service solutions aligned to SSC's 11 key mission areas. It also serves as a tool that provides industry with more transparency into how their submission is being handled by SSC. Front Door's platform is able to direct submissions to the right SSC leader, ensuring innovation doesn't get lost or go unread. On the back end, this enables the SSC team to evaluate and track each submission while establishing metrics important for measuring success, identifying areas to improve, and offering process clarity.

While simple in theory, creating Front Door required strong leadership support from SSC's first Commander, General Michael Guetlein, who established the effort as a priority before being appointed to serve as the second vice chief of space operations. It also required assembling the right team who understood the technology requirements along with the nuances of commercial and military ecosystems. With the organizational support and the necessary technical knowledge in place, we were positioned to develop a platform featuring a tool that worked for both SSC and our private sector partners.

The outcome has been even better than we expected. Through Front Door, we're able to more easily source, understand, develop, and iterate on industry tools and services in ways that are transforming how SSC harnesses and scales innovation. The industry connections and innovations fostered by Front Door have been shared within the Space Force and broader US military, too. The impact has also initiated a broader conversation between SSC, the Space Force, and other US government organizations, as well as with allies and partners alike regarding the importance of collaborative innovation pathways and the nuances associated with creating them.

While Front Door may sit within SSC, the pathways for innovation created by this effort reach far across the space domain.

What the 10x future holds

More pathways for more innovation

- **Problem-centric pathways:** Where critical problems, like climate change, call for concerted efforts, governments can center innovation pathways on those problems and direct innovators to government organizations. Government is already familiar with organization-centric pathways. Organizing around shared government challenges could be a logical next step.

- **A front door for every government department:** Right now, Space Force and the State Department's DIU each has a separate innovation pathway for military contractors. Government could instead consider having one front door for all innovators, leading inventors to any department that might need new technology. Government departments could share information to connect innovations and partners.

Smarter innovation ecosystem

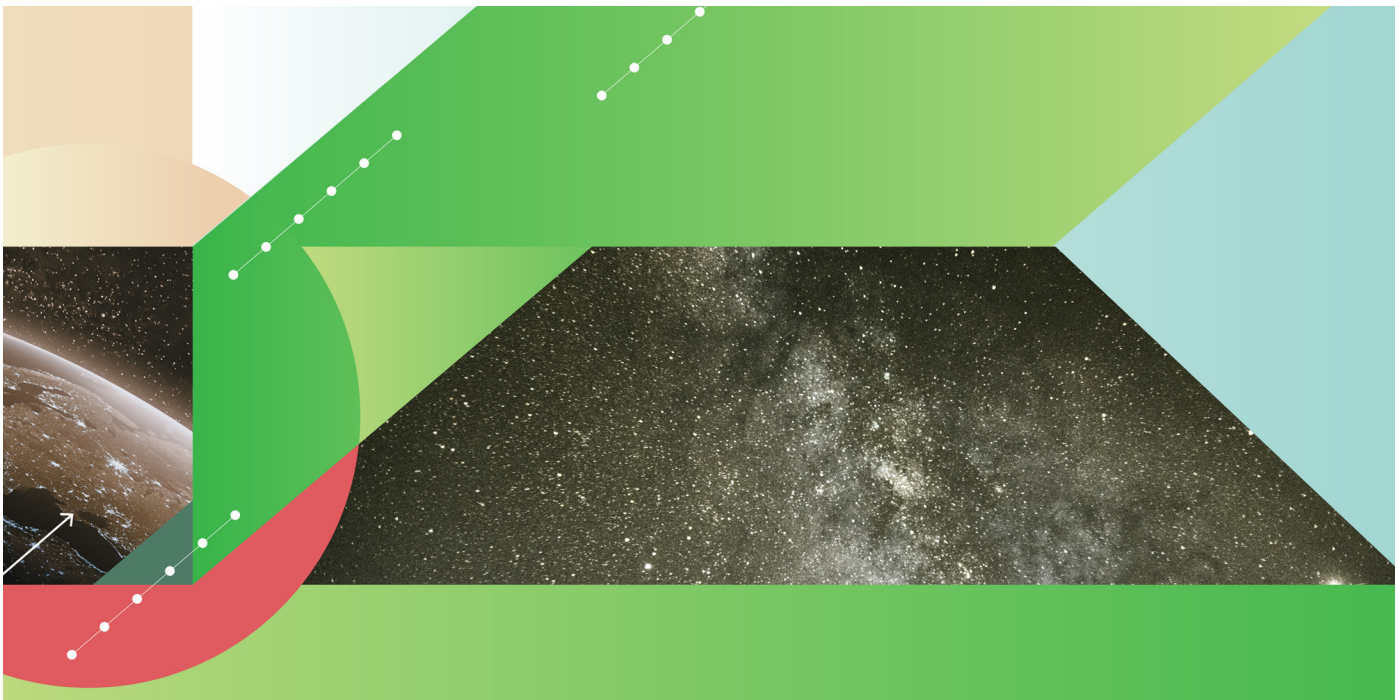
- **AI ecosystem concierge:** Through a virtual AI assistant serving as an ecosystem manager and directory, government could more easily sense and make sense of innovation ecosystems. Just as advertisers target consumers with products or services, the AI assistant can connect government leaders with relevant innovations found throughout the ecosystem. A more sophisticated AI assistant could also be able to inform next steps, help understand incentives among actors in the ecosystem, determine interventions, and facilitate cooperation. AI is already being used to improve customer service, market sensing, and process optimization.[36] Leaders could also use those tools to better understand innovation ecosystems.

- **Faster innovation cycles through AI-driven connections:** Not all innovations require complex ecosystems—some just require the right partners. Government could leverage AI tools to speed innovation cycles. AI can connect solution providers to suitable problem owners and connect complementary innovations, speeding up adoption and iteration of ideas.

Enduring conditions for innovation

- **Long-standing governmentwide innovation challenges:** Governments can create programs that provide outcome-based challenges to fuel innovation for critical needs in perpetuity. Not unlike Impact Canada, outcome-based challenges can provide a guaranteed innovation outcome that could be tailored to address changing problems.

- **International innovations challenges:** Governments can pool resources to incentivize innovation at scale by creating international innovation challenges. These can address cross-cutting issues, like climate change or supply chain resilience. More resources attract more organizations to compete. Through international challenges, the innovation ecosystem can become more diverse and innovative.



Steps governments can take now

Harnessing 10x innovation can have significant benefits. Government can consider these steps to put themselves on the road to capturing those benefits:

- **Acknowledge the ecosystem:** A first step to catalyzing innovation through an ecosystem is acknowledging it exists. Governments can use a variety of tools—from contract data to supply chain information to map the players in an innovation ecosystem and help uncover the hidden relationships that bind the ecosystem together.

- **Embrace the messiness:** Like natural ecosystems, innovation ecosystems can be messy. Competing interests and misaligned incentives can cause players to work against even their own stated goals. Understanding the incentives at play can be a difficult human affair. Embracing that messiness and using qualitative interviews and surveys to help understand what drives each player can be a significant step toward a positive outcome. It can also be helpful to use the messiness as a reason to try new approaches. For instance, by creating new organizations, like DIU, finding new ways to partner with industry, like NASA's commercial crew program, or simply adjusting aspects of contracting, like switching from a "statement of work" to a "statement of objective."

- **Work toward a cascade of change:** Finally, government leaders should embrace the concept "government as gardener," setting the right conditions for an outcome to grow naturally. Using what they've learned about innovation ecosystems, leaders can anticipate when an intervention will produce a cascade of responses from other players, moving the entire ecosystem closer to its common goal.

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Crossing boundaries to transform mission effectiveness

Government agencies are collaborating with other entities and the private sector to solve wicked problems, achieving a 10x boost in mission effectiveness.

Big problems like homelessness or climate change extend beyond the boundaries of any particular branch of government. These wicked problems require cross-boundary collaboration—between multiple government agencies, the private sector, nonprofits, and the communities most directly impacted, and sometimes across geographies, states, and even the globe.

For instance, homelessness is a cross-boundary problem. There are many reasons for homelessness, and no one government agency has a simple fix. Attempts by government and civic organizations to help often yield benefits, but they can be difficult to scale.

Coordinating among different organizational cultures, funding structures, and missions is no easy task. It requires systems thinking, looking at the relationships between people and organizations with competing priorities, and understanding the "structures" that underlie complex situations.[1] But cross-boundary missions can lead to dramatic, "10x-level" outcomes:

- Between 1990 and 2003, the Human Genome Project mapped the human genome—a groundbreaking achievement with massive benefits for biological research, medicine, and pharmaceuticals. Investing roughly US$3 billion, the US Department of Energy and the National Institute of Health tapped into a network of universities and research centers in 20 countries to achieve this invaluable feat.[2]
- Since 2011, the city of Houston, Texas, has reduced homelessness by 64%, thanks to a collaborative effort of more than 100 organizations working together on a shared goal.[3]
- India's Mission Shakti program aims to empower women through local partnerships by providing employment opportunities and financial security. The program has successfully created over 7 million female entrepreneurs.[4]
- The US Department of Health and Human Services reports that the government has invested more than US$100 billion in US President's Emergency Plan for AIDS Relief (PEPFAR) till date to fight the HIV/AIDS epidemic. This investment has resulted in the prevention of millions of HIV infections and saved over 25 million lives.[5]

Few problems respect organizational boundaries. A prime example of this is recidivism, where the successful reintegration of an individual back into society involves a multitude of organizations. Interventions may begin during incarceration, with in-prison counseling,

education, and work experience. Upon release, the individual may require additional support from the government, such as mental health services, substance-abuse counseling, housing, or job training. Helping released individuals find social connections and jobs in the community may involve nonprofits, churches, and businesses. No single agency—not even the government alone—can address all these tasks.[6]

Complex challenges are often best addressed by working across different organizational boundaries. However, collaboration between government agencies is not always easy, as funding streams, legislative authority, and operational hierarchies tend to encourage silos that isolate agencies.[7] Governments are developing mechanisms to break down these barriers and collaboratively tackle thorny problems.

Breaking trade-offs

Traditionally, lowering costs would mean compromising on quality or slowing down speed. Similarly, achieving improvements in quality would result in higher expenses. To accomplish a 10x boost in performance, leaders must break the constraints of traditional trade-offs. This may involve leveraging technology to minimize the cost of serving clients, partnering with organizations that already offer a service, or relinquishing complete control—and credit—to collaborate. Sharing responsibilities across bureaucratic boundaries can make room for exponential growth. Governments can catalyze innovation and access additional resources to address a problem by tapping into a network.[8] Consider these approaches that break the "iron triangle" (cost, speed, and quality) model of service delivery trade-offs:

- **Financial incentives:** Initial seed or matching funding from the government can attract nonprofit, academic, and corporate investment, multiplying each dollar's impact.[9]

- **Skills marketplace:** Specialists in some specific topics may not be readily available within the public sector, especially in just one department. Collaborative efforts gather a range of key skills that can be difficult (and expensive) to hire.

- **Trust amplifiers:** The government can reach wary constituents by collaborating with organizations that have preexisting trusting relationships.

- **Multiplier effects:** A network increases in value with every new participant. Creating a network of stakeholders can start a virtuous cycle. Depending on the problem, it may even be possible to build a self-propelling market that drives toward a solution on its own momentum.

Convergence: A key to 10x change in mission effectiveness

Several tools and tactics can improve cross-boundary collaboration. Certain innovations like cloud-based data-sharing, common application programming interfaces, and new funding models make it easier for partners to steer distinct organizations toward common goals. Other tools like data analytics, ecosystem mapping, nudges, and artificial intelligence will help teams achieve those goals.

Leaders will find an impressive menu of tools to tailor to their specific problems. The public sector now has access to tools that, when used wisely, can make collaboration easier and more effective.

- Employer-designed training + talent matchmaking + wraparound support = Skilled workers with higher wages (see the Network2Work example below)

- Birth registration mobile app + interagency data-sharing = Easy birth registration (see the Singapore LifeSG example below)

- Skills training + partnership with banks + access to social networks = Boost in female entrepreneurship (see the Odisha Mission Shakti example below)

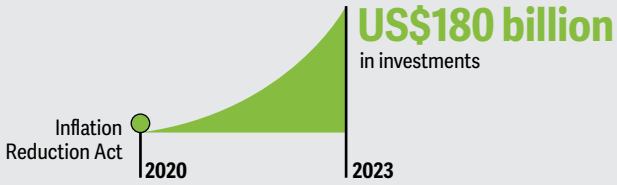
Trend in action

Governments are using several approaches to converge around cross-cutting problems. They are achieving better outcomes through three main strategies:

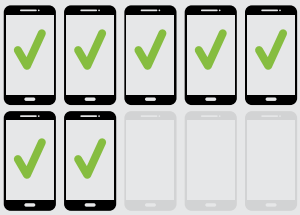
Figure 1

By the numbers: Crossing boundaries to transform mission effectiveness

Since the passage of the Inflation Reduction Act in 2020, the private sector has witnessed an uptick in investments, with more than US$180 billion flowing into clean energy manufacturing projects.

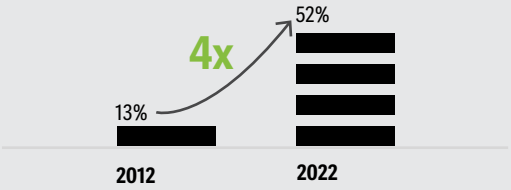


Ukraine's Diia is an integrated digital ecosystem with 70 government services. It has 21.7 million users and is installed on over 70% of all smartphones in just three years.



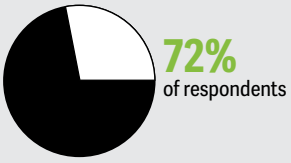
70%
of all smartphones have installed Diia in just three years

The government of India's Digital India program has led to a 4x increase in internet penetration.

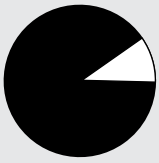


72% of respondents said **that cross-sector collaborations** help achieve mission outcomes.

A fifth of federal executives are involved in more than 10 collaborations



72%
of respondents



involved in more than **10** collaborations

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Tapping into boundary-breaking partnerships: Innovative partnerships bring together all stakeholders needed to address a complex problem—whether from different agencies, levels of government, the private sector, academia, or nonprofits. This sometimes means the objectives of programs need to be adjusted to catch up to new, shared definitions of success. One key boundary to break is who should be involved in helping to develop solutions. This so-called "co-production" involves engaging those experiencing a problem in designing a solution.

Using data and technology to focus shared efforts: Governments are building a robust digital infrastructure with data-sharing capabilities, enabling better collaboration among individuals and agencies working on the same problem.

Governance, measurement, and policy shifts to break down silos: Through shared governance, goal-based funding, and other policy shifts, the back-end structure of government can support coordination between stakeholders. When success is designed from multiple perspectives, solutions can address all aspects of a problem and avoid a "one-size-fits-all" definition of success.

Tapping into boundary-breaking partnerships

Myriad problems faced by the government are not confined to the boundaries of individual government agencies. They arise from market forces, dynamic relationships, and entrenched habits. Solutions then require multiple actors to collaborate across a range of disciplines, both within and outside government.

By breaking down silos and encouraging inteconnectedness, many governments have achieved 10x improvements on these complex problems.

United Arab Emirates' Government Accelerators program brings together private and public sectors for innovative solutions

In 2016, the United Arab Emirates launched the Government Accelerators program led by the former assistant director general for Strategy and Innovation at the prime minister's office. The program focuses on cross-boundary issues and brings together teams comprising participants from various government agencies, the private sector, and academia.

These teams work on 100-day challenges to develop potential solutions with a sense of urgency, exercising full autonomy to experiment without interference from leadership. On the 50th day, the teams are expected to show progress, and on the 100th day, they present results with ideas to sustain and scale impact. The program's approach has yielded impressive results, with participating teams successfully addressing diverse issues such as road safety and newborn services.

One team aimed to reduce traffic deaths on the country's high-risk highways, and the team comprised local officials, road engineers, police, and ambulance drivers. It developed a solution that included road redesign, highway radar, social media awareness campaigns, and faster first-response strategies. At the end of the 100-day challenge, the accelerator team had reduced traffic deaths by 63%.

In 2021, the success of the United Arab Emirates' Government Accelerators inspired the World Health Organization to adopt a similar model to speed up the achievement of its strategic goals.[10]

Building a strong workforce development ecosystem: The importance of reskilling and coordination among key players

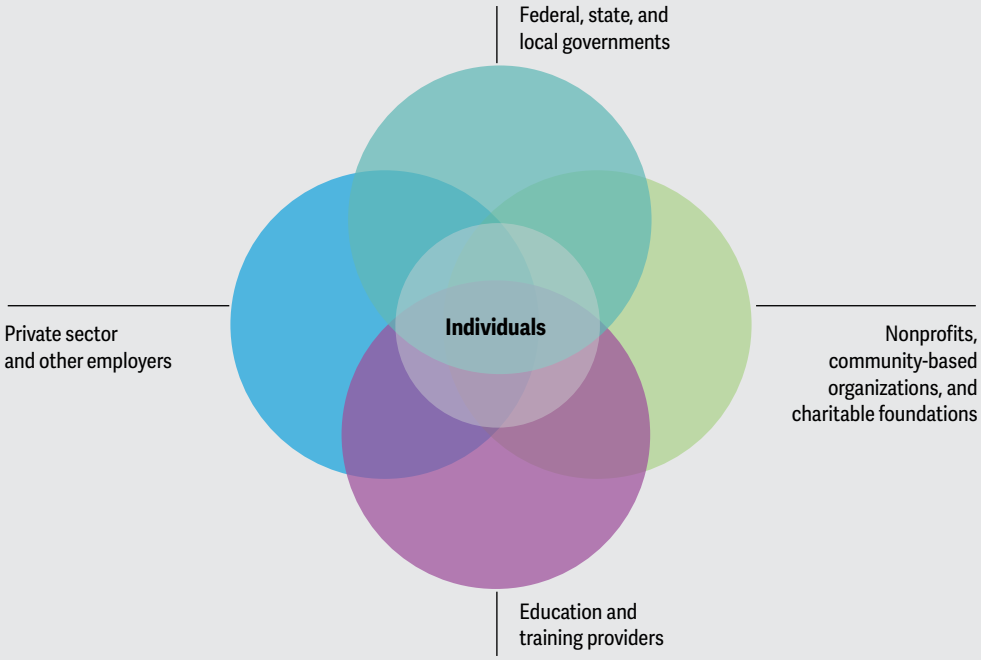
Workforce development occurs in a dynamic ecosystem(figure 1). Each participant—including job seekers, training providers, and employers—has different roles and motivations. It can be challenging to align their incentives to ensure job seekers are trained for in-demand jobs. As technology changes, what is in demand will change as well. Artificial intelligence may be able to write code for an electric vehicle's 220V charger initialization but can't physically install the charger. Differentiated training, including those in future trending skills, is critical to equip a wide range of workers.

Coordinating between different players in the labor market has helped regions boost skills and match job seekers with employment. In Charlottesville, Virginia, the nonprofit Network2Work plays the matchmaker role between local employers and job seekers.[11] Network2Work coordinates with local employers to

Figure 2

Collaboration is crucial for a strong workforce development ecosystem, and Network2Work has fully embraced this principle

Key participants in the workforce development ecosystem



Source: John O'Leary, Nicole Overley, and Amrita Datar, "Rethinking the workforce development ecosystem: Grow the economy by bridging the skills gap," *Deloitte Insights*, August 8, 2023.

HOW CROSS-SECTOR EFFORTS CAN AMPLIFY 10X IMPROVEMENTS

Big challenges require collaborative solutions. Networks can amplify outcomes by connecting leaders with needed skills, funds, and ideas.

- **Seed money:** The Smart Columbus program, a smart city initiative to improve quality of life, was kick-started when it secured a grant from the US Department of Transportation. These funds became the nucleus for a regional effort that expanded with a grant from the nonprofit Paul G. Allen Family Foundation for US$10 million, as well as the engagement of numerous civic and business groups and multiple government participants.[13]
- **Prizes:** Prizes and challenges can also tap into networks. The XPRIZE organization sponsors competitions to encourage technological development. Since 1994, it has launched 28 challenges in various fields, including space, food insecurity, and climate. These prizes have attracted 35,000 innovators from around the globe.[14] The XPRIZE challenge has resulted in close to 900 patents and accelerated innovation in multiple industries.[15] Government agencies can also sponsor challenges. In 2021, the US Department of Education launched a US$1 million digital learning challenge to modernize, accelerate, and improve teaching tools.[16]
- **Partnerships:** In 2022, Congress passed the CHIPS Act, which authorizes about US$52 billion to boost American semiconductor research and manufacturing to reduce reliance on foreign providers (figure 2). This is meant to ensure a broad, collaborative effort that included the participation of the private sector. The CHIPS Act incentivizes private players to manufacture in the United States through government investment in research, manufacturing, and workforce development. This approach allows governments to form critical relationships with manufacturing companies, and it also has a significant dollar multiplier effect. Companies have already invested an additional US$220 billion.[17]

Figure 3

CHIPS Act spurs private investment and job creation in US semiconductor industry

70
new semiconductor ecosystem projects have been announced across the United States

US$220 billion
worth of private investments announced across **22 states**

44,000
new high-quality jobs announced in the semiconductor ecosystem

Source: Robert Casanova, "The CHIPS Act has already Sparked $200 billion in private investments for U.S. semiconductor production," Semiconductor Industry Association, December 14, 2022.

identify job needs, while community leaders identify suitable individuals to receive job training at Piedmont Virginia Community College. The organization also provides wraparound support such as childcare, transport, and health care to ensure the success of the newly hired. On average, program graduates more than doubled their income.[12] The success of Network2Work in the Charlottesville area has led to an expansion of the program to other parts of Virginia.

Using data and technology infrastructure to focus shared efforts

Data and technology can help focus the efforts of disparate actors as they work on a difficult, boundary-breaking challenge. By serving as a critical conduit to information, they can encourage the cooperative effort of different players addressing a challenge and spur contributors toward eventual true co-creation.

India Stack boosts financial inclusion through technology

In 2010, India sought to improve financial inclusion for its citizens, particularly among the poor and marginalized. Only one in three citizens had a bank account, and fewer than 50% had a nationally recognized ID to present to bankers.[18] India built a technological foundation for dramatic improvements with India Stack—a digital financial platform that includes digital identity, government benefits, and a financial transactions engine. Over 500 million new bank accounts were opened, more than half of which were opened by women. Additionally, banks' cost to conduct e-KYC has plummeted from US$23 to US$0.1.[19] Today, more than 75% of all retail transactions in India go through India Stack.[20] Over the last decade, almost 90% of Indian citizens signed up for a digital ID.[21] By working together, India's government and the banking industry transformed the way financial transactions occurred.

India Stack comprises application programming interfaces, digital products, and frameworks that enable large-scale data-sharing, digital payments, and e-identity. It is owned by various Indian government agencies and subsidiaries.[22] (To learn more about India Stack, read our **CX trend**.)

Enhancing customer experience through life event service delivery: The success of Singapore's LifeSG app

Across the globe, from the United Kingdom to Estonia to Singapore, governments are adopting a life event service delivery structure, which can dramatically enhance a citizen's customer experience.[23] In this structure for organizing government services, a life event—such as a job loss, birth of a child, or death of a loved one—proactively triggers service interactions with multiple government agencies. Without life event services, individuals must navigate various government agencies for a single life change. The United Kingdom, for instance, found that, to register a death officially, the bereaved needed to notify government entities from federal pensions to local tax authorities up to 44 times.[24]

Life event services can be challenging for governments to implement due to the involvement of multiple government agencies, but the results can be dramatic.

The LifeSG app, an upgraded version of the app formerly known as "Moments of Life," was introduced in Singapore to assist new parents in handling paperwork related to newborns. By streamlining the process, the app reduced the time needed to register a birth from an hour to just 15 minutes. Since 2018, 70% of Singaporean births have been registered using the app.[25] The app has expanded beyond birth notification to cater to the diverse needs of the entire population. In an interview with GovInsider, Gabriyel Wong, director of Moments of Life, said, "We are always looking to onboard service journeys that are intuitive to citizens."[26] With over 1.2 million downloads, LifeSG aims to simplify life by providing one app with a unified interface for over 100 government services.[27]

Governance, measurement, and policy shifts to break down silos

To tackle cross-boundary problems, leaders need to reevaluate leadership mechanics, including governance, policy, and performance measurement, to foster collaboration.

Odisha's Mission Shakti program leads to a dramatic boost in female entrepreneurship

The government of Odisha—a state in eastern India with a population of 41 million—launched the Mission Shakti program in 2001 to empower women by expanding employment and financial security. (The term "shakti" means "power" and, in Hindu philosophy, is often associated with feminine creative powers.) The government recognized that women faced three critical barriers to entrepreneurship: lack of skills, limited access to networks, and difficulty in securing institutional finance. Women often relied on informal high-interest loans from unscrupulous lenders, and the government sought to address this issue with this initiative.

Mission Shakti partners with nationally known skill development institutes, including nonprofits and academic institutes, to help women upskill. Women are organized into self-help groups to strengthen their networks, a form of co-production that involves them in developing solutions. Further, these groups form block-level federations that provide institutional support for everything from marketing products to lobbying. A strategic partnership between the Mission Shakti

organization and the banking sector ensures that the self-help groups have access to institutional credit. To improve the creditworthiness of members, Mission Shakti provides seed money to each eligible self-help group. It also provides a revolving fund of 2.5 million rupees to the self-help groups to strengthen capacity and provide financial autonomy.[28]

Mission Shakti self-help groups grew from about 40,000 in 2001 to 600,000, covering 7 million women in 2021.[29] The program has transformed the lives of its members across both rural and urban parts of Odisha. For example, according to the 2022 annual report, the Maa Vaibhav Laxmi self-help group, which does woodwork, including making nameplates, souvenirs, and key chains, earns a monthly profit of 35,000 rupees to 40,000 rupees. Likewise, the Debasis self-help group set up a semi-mechanized pickle unit that makes about 800,000 kilograms of pickles annually. The group has an annual turnover of six million rupees with a monthly profit of 50,000 rupees to 60,000 rupees.[30] Mission Shakti program's robust governance has brought all the stakeholders together, making such a significant impact possible.

Collaborative efforts lead to over 60% decrease in homelessness in Houston

Since 2011, Houston has remarkably reduced homelessness by 64%. This success was the result of the coordinated effort of more than 100 organizations aligning on goals and working together to achieve them. As part of the effort, a cross-sector data platform gave all providers access to critical information. Sylvester Turner, the former mayor of Houston, emphasized that collaboration was instrumental in achieving this success. "Collaborate, collaborate, collaborate," Mayor Turner noted on a Deloitte podcast. "No one group can do this by itself."[31]

My take

Reducing homelessness in Houston through collaboration

Mike Nichols, former president & CEO, Coalition for the Homeless of Houston/Harris County[34]

In 2011, Houston and its surrounding counties found themselves struggling with the sixth largest homeless population in the United States. However, through concerted efforts and a pioneering approach, the city has emerged as a national model in combatting homelessness, achieving a commendable reduction of over 60% in its homeless population.[32]

Recognizing the urgency of the situation, a collective effort known as "The Way Home" was founded. This collaboration, comprising more than 100 organizations, included several governmental agencies from various cities and counties, leaders from multiple large and small businesses, major philanthropic organizations, and dozens of nonprofit entities focused on serving individuals experiencing homelessness. With the help of technical assistance from the federal Department of Housing and Urban Development, this group first established its overreaching principle—prioritize permanent housing and supplement it with comprehensive support services. The outcome has been substantial, with over 30,000 individuals having been placed in permanent housing since 2012.[33]

What sets Houston apart is not only the "housing-first" strategy but also the establishment of a big tent and comprehensive public-private ecosystem comprising businesses, philanthropists, nonprofits, faith groups, and local, state, and federal government agencies—all dedicated to confronting this complex issue. Coordinated by a "lead agency," the nonprofit Coalition for the Homeless, these 100 organizations are organized into two key components: A diverse and engaged 501(c)(3) board oversees the nonprofit's governance and sustainability, drawing representatives from the business, government, and nonprofit communities. While the Coalition for the Homeless is responsible for building collaboration among the entities of The Way Home, the Continuum of Care Steering Committee, composed principally of government funders and adjacent system leaders, is responsible for building capacity for housing and services funding for homeless individuals and families.

This collaborative process requires the Coalition for the Homeless to have ongoing and daily interactions with various government administrators who are often fearful of running afoul of complex regulations. The work of building collaboration and building capacity is never complete. Having a strong nonprofit lead agency, independent of any one governmental entity, focused on building collaboration and capacity allows The Way Home to develop comprehensive cross-boundary effectiveness.

Data plays a pivotal role in the system's decision-making processes. Our Homeless Management Information System is a robust tool that meticulously tracks and analyzes the services rendered to the homeless population. Transparency in our operations is paramount, and high-level data is accessible on our website for public scrutiny.

However, our achievements have not been without hurdles. Persistent issues in our systems, such as the release of individuals from correctional facilities without adequate support, housing discrimination, and a fragmented mental health infrastructure, underscore the systemic challenges we continue to navigate. Further, the difficulty in finding, using, and braiding dozens of state and federal funds with their restrictive regulations and seemingly impossible timelines compound the insecurity of our homeless response system and, thus, our clients.

The work that is being done in Houston and its surrounding counties is both fiscally and morally responsible and proves that government, with the collaboration of its partners outside of government, can be effective and efficient. However, the funding for such programs should be enhanced and made less onerous to use. By prioritizing funding proactive measures to address homelessness, we can decrease future health care and criminal justice expenses and, more importantly, promote positive societal change.

What the 10x future holds

- **Bridgebuilder organizations:** As governments converge to solve wicked problems, expect more bridgebuilding activities that handle coordination between different agencies. For example, the US Army and Air Force have formed the Combined Joint All-Domain Command and Control oversight group to combine data and assets for greater synchronization of effort.[35]

- **Shared funding:** While "shared funding" models are not widespread at scale, the future could see an increase in "issue-focused funding" instead of department or program funding—to support multiple agencies in combined efforts. For example, to advance clean energy nationwide, the Australian federal government established the Rewiring the Nation initiative with AU$20 billion in funding to transform the country's electric grid.[36]

- **Blurred lines between public and private:** Governments are increasingly partnering with private sector participants to pool resources and capabilities. Government incentives can help nudge businesses to embrace social and environmental responsibilities and adopt purpose-driven business models that can help deliver public solutions.

Steps governments can take now

Recognize your organization's limitations: Sometimes, we all need a helping hand. Recognizing when a problem may be bigger than a single organization is a key first step.

Challenge orthodoxies: Reconsider "how we do things here," and revisit historical policies that hinder the scope of cross-sector collaboration. Consider moving from a model that funds just one program to a shared funding model.

Focus on outcomes: Shift the focus from processes to outcomes. Define clear objectives, and measure success based on the impact on citizens. Remember that success measures can and should be tailored to organizations' unique contributions to the coalition of partners tackling the problem.

Embrace digital: Embrace digital technologies and the power of human accelerators like AI to improve overall efficiency, freeing up key stakeholders to focus on the toughest part of the challenge. More and more, the routine aspects of coordinated service delivery can be sourced to "multimodal" cognitive automation tools like AI models trained on working processes across organizations.

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Government's resilience imperative

Governments are embedding resilience within their operations and bolstering society's ability to withstand and recover from a broad spectrum of disruptions.

In October 2012, Superstorm Sandy left the city of Hoboken, New Jersey, submerged and without power for nearly a week, causing US$110 million in damage and leaving residents and business owners anxious about future weather events. Recognizing the city's vulnerability to flooding—most of it is located on a flood plain—city officials decided to invest in reconstructing sewers to enhance interior drainage capacity and redesigning streets to efficiently collect and redirect water. The effectiveness of these measures was put to the test in September 2023 when another waterlogged storm arrived. This time, the impact was minimal. The power stayed on, only a few intersections experienced brief flooding, and residents largely carried on as usual.[1]

Government leaders worldwide have been working on similar initiatives, ranging from constructing sea walls in coastal cities to defend against rising sea levels and weatherizing aging power grids to endure cold snaps, to using Internet of Things sensors and artificial intelligence technology for faster wildfire detection and response and establishing early cyclone warning systems.[2]

Climate change and extreme weather events either cause or exacerbate these crises. But resilience efforts encompass a much broader scope, with governments focused on amplifying their ability and that of the communities they serve to withstand and bounce back quickly from a wide range of disruptions, including supply shocks and cyberattacks.

The resilience imperative has elevated the prioritization of hardening both government operations and broader society. Every rare natural disaster, every ransomware attack, and every broken supply chain has raised awareness, unlocking greater resources and investments for resilience endeavors.

Breaking trade-offs

Since the days of ancient Rome, when Augustus Caesar organized the first municipal fire brigade,[3] governments have taken responsibility for emergency preparedness. And since preparedness is purely a cost, lawmakers have tended to spend as little as possible on it, hoping that next year would be disaster-free.

Governments can ill afford to do that now, in an era of constant threats. With agencies facing regular operational disruptions, resilience has become a critical enabler of mission success. And this increasingly clear link has elevated resilience to the top of the government's priority list.

Convergence: The key to 10x resilience in government

Boosting resilience—much less realizing 10x improvements—demands a multifaceted approach. In response, governments are leveraging their regulatory authority and financial resources to upgrade critical infrastructure. They are also harnessing emerging technologies such as AI and digital twins to better understand challenges and implement effective, preemptive countermeasures. Moreover, there is a concerted effort to align corporate and government interests and promote collaborative public-private partnerships. The confluence of such initiatives bolsters the capacity and capability of both government and society to operate effectively across a broader range of conditions while lowering the costs associated with disruptive events.

Consider how amalgamating different tools could substantially impact the resilience of both the public sector and civil society.

- Data analytics + digital infrastructure + ecosystem mapping + evidence-based policymaking + public-private partnerships = Increased climate disaster preparedness
- Data analytics + ecosystem mapping + public-private partnerships + regulatory adjustments + incentives = Strengthened critical supply lines
- Digital infrastructure + data-sharing + regulatory adjustments + public-private partnerships = Enhanced cybersecurity ecosystem

Trend in action

World leaders are currently grappling with a "poly-crisis," where multiple critical systems supporting human society and the economy are under severe stress.[4] To effectively navigate and thrive in this challenging environment, governments must prioritize building resilience against a wide range of threats at both the public sector and community levels.

Governments are employing a range of tools to achieve 10x resilience improvements in:

- Building capacity to be climate resilient
- Securing critical supply chains
- Nurturing an ecosystem for collaborative action against cybercrime

Building capacity to be climate resilient

Governments need to confront the challenge of climate change on two fronts: fortifying their capacity to fulfill their missions amid climate-related disruptions and safeguarding individuals and communities from the detrimental impacts of climate change—both increasingly common weather events and gradually rising temperatures and waterlines.

To safeguard their missions, government entities have intensified their efforts to understand and embrace how climate change affects their missions—and act in a way that both aligns with and advances their objectives.

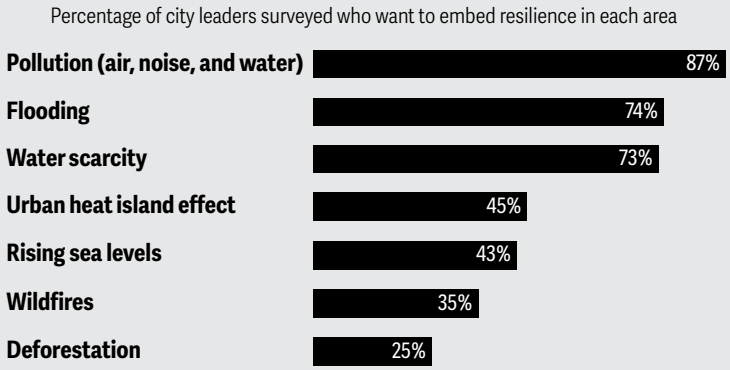
Countries are channeling substantial investments into climate resilience. In the United States, the passage of three pieces of legislation—the Infrastructure Investment and Jobs Act, the CHIPS and Science Act, and the Inflation Reduction Act—is set to collectively direct more than US$500 billion toward climate resilience and the transition to a low-carbon future over the next decade.[5] Meanwhile, India spent approximately US$160 billion in the fiscal year 2021–22, equivalent to just over 5.5% of its GDP, on climate adaptation. Anticipating ongoing needs, India expects to spend an additional US$680 billion through 2030 on climate adaptation.[6]

Significant government investment is being directed toward enhancing agencies' capacity to ensure uninterrupted provision of critical services such as water or power during and after extreme weather events. Consider the mobility sector: Disruptions to transportation networks during climate events not only affect the movement of goods and people but can also block access to critical services such as health care. In response to projections indicating increased rain and flooding over time, Great Britain's national railway manager, Network Rail Limited, is making substantial investments to improve drainage systems and fortify earthworks such as embankments. Network Rail has allocated £1 billion for weather resilience activities during the five-year

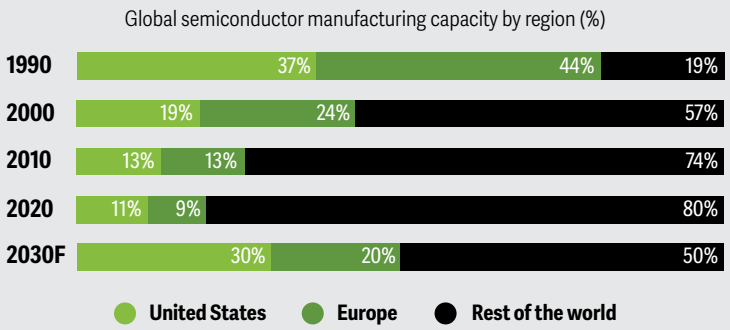
Figure 1

By the numbers: Government's resilience imperative

Priority areas for cities globally to build climate resilience

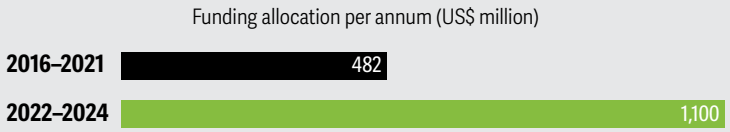


The United States and the European Union have both passed Chips Acts to bolster their semiconductor supply chain by enhancing domestic manufacturing



Note: 2030F reflects US and Europe numbers based on aspirations of their respective Chips Acts.

Per annum funding allocation of the United Kingdom's Cyber Security Strategy more than **doubled from 2022**



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period from 2024 to 2029, doubling the £500 million designated for similar purposes in the five years leading up to March 2024.[7]

While extreme weather events continue to cause substantial damage, sustained investments in enhancing climate resilience at the community level have allowed many governments to diminish both the human and economic costs associated with such incidents. These initiatives are strengthening society's ability to function effectively in the midst of climate disasters.

Many agencies are now appointing chief sustainability officers or equivalent officials to lead resilience efforts and coordinate intra- and intergovernmental action. In 2021, Phoenix, one of America's hottest large cities,[8] established the nation's first publicly funded Heat Response and Mitigation office and appointed a chief heat officer. The agency has two interconnected missions: providing relief to citizens affected by extreme temperatures and implementing long-term heat mitigation strategies to cool the city. The heat office has prioritized initiatives such as tree planting, retrofitting house roofs and pavement with cooling materials, building affordable housing to provide shelter from extreme heat to vulnerable populations, and creating public cooling and hydration centers for residents seeking relief. A portion of the city's nearly US$400 million from the federal government's COVID-19 rescue package supports the initiatives.[9]

Most places on earth are exposed to the threat of climate events, prompting local governments worldwide to introduce measures to help ameliorate extreme weather events. Seoul has implemented a comprehensive set of initiatives to bolster community resilience, beginning by collecting and analyzing data from Internet of Things sensors deployed across the city. Leaders expanded Seoul's urban green space, planting 12.45 million trees between 2016 and 2020, and enhanced stormwater management by installing 120 rainwater pumps. The city also modernized aging infrastructure, upgraded 900,000 boilers and heaters, achieved an earthquake-resistance rate of 76.7% for public facilities, and appointed public safety "watchdogs" and honorary "safety sheriffs" trained in cardiopulmonary resuscitation and emergency evacuations. Recognizing these efforts, the UN Office for Disaster Risk Reduction designated Seoul as a model city for disaster risk reduction and resilience.[10]

Securing critical supply chains

Each significant disruption in recent times, from the COVID-19 pandemic to the Russia-Ukraine war, has triggered severe shortages, compelling governments to strengthen supply chains through a mix of policies, incentives, and orders.[11]

In 2021, the US federal government directed agencies to evaluate potential supply chain risks and develop strategies to alleviate those risks.[12] Subsequently, a series of measures were enacted to bolster America's supply chain resilience. One of these measures was the creation of the Council on Supply Chain Resilience, which brought together leaders from various cabinet departments and economic, national intelligence, and environmental councils to coordinate a whole-of-government response to supply chain vulnerabilities.[13] Additionally, collaboration with the European Union has resulted in the establishment of an early warning system for semiconductor supply chain disruptions.[14] Furthermore, in partnership with a dozen other countries and the European Union, the United States established the Minerals Security Partnership, aimed at diversifying the supply chains of critical minerals.[15]

In the wake of pandemic-related disruptions, governments worldwide have looked to reshore critical supply chains to reduce dependence on foreign suppliers. Since few governments have the power to dictate where private companies should source or make products, policymakers are increasingly providing incentives—including subsidies, tax breaks, and loan guarantee programs—to encourage companies to bolster domestic production capabilities. Moreover, government support for innovation, research and development, and knowledge-sharing can enhance domestic manufacturers' technical capabilities.[16]

When the pandemic cut off routine supplies of new semiconductors, it quickly became clear how vital the components have become to electronic devices, from cars to fighter jets. National governments first sought to understand their exposure to foreign nations by mapping their multitier supply networks. They then used a targeted data- and insight-driven approach to determine focused areas for action at tier 1, 2, and 3 suppliers. Governments have subsequently

aimed to stand up domestic semiconductor manufacturing industries, offering incentives to establish commercial viability for private sector involvement in domestic production.[17] The US CHIPS and Science Act of 2022 earmarks nearly US$280 billion in new funding to advance domestic semiconductor research and manufacturing.[18] The bulk of the funding is designated for research and development and commercialization, with US$39 billion in subsidies for domestic chip manufacturing and a 25% investment tax credit for manufacturing equipment expenses.[19] Several global corporations have announced their plans to take advantage of these incentives by making multibillion-dollar investments in US semiconductor manufacturing plants.[20]

Similarly, the European Commission enacted the European Chips Act in 2023, consolidating €43 billion in public and private funding for the sector with the aim to double the EU's share of global chip production from 9% to 20% by 2030.[21] Since announcing the plan in 2022, European Union policymakers have attracted around €100 billion in commitments from public and private entities for industrial deployment.[22] Other countries, including the United Kingdom, China, Japan, and South Korea, have also announced plans to establish favorable conditions for domestic semiconductor manufacturing.[23]

Nurturing an ecosystem for collaborative action against cybercrime

The high frequency and intensity of cyberattacks, coupled with an expanding attack surface and cross-border networks of threat actors, make it necessary for governments to partner more extensively with other nations to consolidate knowledge, resources, and capabilities to collectively combat cybercrime.

Public sector–led cyber alliances have sprung up rapidly all over the world, with many focused on combatting specific types of cybercrime. Established in 2022, the International Counter Ransomware Initiative is a US-led coalition of 50 countries that aims to enhance international cooperation to combat the growth of ransomware.[24] Also, in 2022, the United States, Japan, Australia, and India forged the Quad Cybersecurity Partnership to safeguard critical infrastructure from cyberattacks.[25]

One area in which cyber coalitions have seen tremendous success is taking down malign botnets. In 2023, a collaborative effort led by the US Federal Bureau of Investigation (FBI) successfully dismantled the Qakbot botnet that had infected more than 700,000 systems, using them for activities such as spam distribution, ransomware deployment, and attacks on financial institutions.[26] Officials estimate that in the 18 months preceding its takedown, the botnet helped facilitate more than 40 ransomware attacks, generating US$58 million in ransom payments.[27] Dubbed "Operation Duck Hunt," the takedown saw the FBI work with law enforcement agencies from France, Germany, Romania, Latvia, the Netherlands, and the United Kingdom to gain access to Qakbot's infrastructure located in the United States and across Europe. The FBI assumed command over the botnet and redirected Qakbot traffic to servers under US government control. Leveraging this newfound access, the FBI directed Qakbot-infected machines worldwide to download an uninstaller that untethered victims' computers from the botnet, preventing any further installation of Qakbot malware.[28]

While law enforcement agencies have traditionally taken the lead on botnet investigations and takedowns, major tech companies—which see a huge volume of global internet traffic pass through their systems daily—are increasingly incentivized to neutralize wrongdoers. In these cases, governments often assume a supportive role. Private sector–led efforts have successfully taken down the Necurs botnet, which had infected more than nine million systems globally,[29] and the Glupteba botnet, which had compromised one million devices.[30]

April Rothermel, Pennsylvania Turnpike Commission's assistant chief technology officer[31]

My take

The increasing convergence of the physical and virtual realms has exposed areas to cybersecurity threats that were previously insulated from such risks. Effectively countering these threats requires the adoption of fresh approaches. The Pennsylvania Turnpike Commission, responsible for managing toll roads in Pennsylvania, is proactively adjusting its governance models and agency culture to safeguard both its operations and citizens from cyberthreats.

Take, for instance, our multiyear modernization project to refurbish both tubes of the Tuscarora Mountain Tunnel—a massive undertaking with a US$110 million investment and a 30-year lifespan. This project, which began in 2019, not only presented typical civil engineering challenges but also introduced a myriad of cybersecurity risks linked to the intricate network of connected devices within the tunnel.

Traditionally, our security team focused on securing conventional computing and network infrastructure. However, with the deployment of connected environmental sensors, automated ventilation systems, and a sophisticated control system, our approach needed to evolve. Embracing a farsighted, preemptive strategy, our security team actively participated in the early stages of engineering and design, collaborating closely with project engineers to integrate cybersecurity measures from the project's inception.

This unprecedented level of collaboration prompted a merging of cultural styles and working norms between the security and engineering teams. We made a strategic decision to tailor and apply prescriptive cybersecurity standards—specifically those used in power grids, such as the North American Electric Reliability Corporation Critical Infrastructure Protection standards—to meet regulatory requirements. This common lexicon facilitated communication, streamlining the design and modification processes.

In the face of diverse challenges, from involving 17 different equipment manufacturers to reconciling security and business requirements, our teams showcased resilience and creativity. We modified long-standing processes to accommodate security needs, challenging vendor expectations and devising solutions when security and business priorities clashed.

Ultimately, our collaborative efforts will make travel through the Tuscarora Mountain Tunnel not only more efficient but also safer. Our commitment to customer and employee safety remains paramount, and the integration of cybersecurity measures reflects the critical role of technology in ensuring the security of transportation infrastructure.

What the 10x future holds

Climate resilience

- **Proactive climate resilience:** Utilizing advanced data analysis and predictive modeling tools, governments will be able to identify a region's vulnerability to a spectrum of climate disasters over an extended time horizon, allowing for the preemptive development of essential infrastructure and resilience strategies.

- **Enhanced emergency preparedness:** Digital twins will significantly advance scenario planning by enabling governments to test multiple possible responses to a wide range of climate disasters. Singapore is already using its digital twin, Virtual Singapore, to simulate emergencies and optimize evacuation plans.[32]

Supply chain resilience

- **Predictive and proactive supply chain management:** Advanced AI models will analyze diverse data sets, including mapping of supply networks, market trends, government policies, economic conditions, seasonality, and international relations. This analysis can then identify patterns and predict future shortages of essential commodities, enabling governments to intervene proactively.

- **Local, on-demand production:** Advancements in additive manufacturing will transform supply chains by allowing on-demand, local production, reducing the need for raw material sourcing, manufacturing, transportation, warehousing, and distribution with their associated complexities and long lead times.[33]

Cyber resilience

- **Predictive cybersecurity:** Generative AI models, trained on vast amounts of historical cybersecurity data, will identify patterns and trends early and accurately predict future outcomes, allowing organizations to implement security measures proactively.

- **Augmented cyber hygiene:** Widespread implementation of the zero-trust cybersecurity approach in both public and private sectors will significantly improve cyber hygiene across networks. In 2022, the US federal government passed an executive order requiring federal agencies and contractors to adopt a zero-trust approach to cybersecurity.[34]

Steps governments can take now

To achieve 10x increases in resilience, governments should consider the following steps.

Climate resilience

- **Link climate action to economic growth:** Climate action presents a major economic opportunity. Agencies should use their regulatory, standard-setting, and funding levers to incentivize private sector involvement. Aligning climate action with economic development can make companies more willing participants in the low-carbon future. Research indicates that climate action could boost the global economy by US$43 trillion by 2070.[35]

- **Empower climate leadership:** As public sector agencies worldwide take the initiative to combat climate change, they are establishing roles such as chief sustainability officer or chief climate officer. Empowering these newly appointed leaders is crucial. Giving them a seat at the table when making strategic and resource allocation decisions can ensure that their decisions receive backing from leadership, secure necessary funding, and receive adequate staffing.

Supply chain resilience

- **Assist industries to understand multitier supply risk and support orchestration:** Governments exert direct control over a tiny portion of critical supply chains, but they can be disproportionately impacted if supply chains are disrupted. Therefore, governments must assist industries in mapping multitier supply networks and comprehend targeted areas of risk. Subsequently, they should facilitate commercial entities in making informed choices and establishing a diverse set of trusted suppliers to strengthen supply chains. Such efforts include establishing new trade treaties or creating "trusted supplier marketplaces."

- **Pair reshoring with friendshoring:** Although governments are widely embracing reshoring, it comes with challenges, such as the availability of raw materials, logistical hurdles, and economic considerations. Collaborating with like-minded partners and allies can provide governments with a reliable network of suppliers from friendly nations, presenting numerous alternative and independent supply routes.[36]

Cyber resilience

- **Enable proactive threat intelligence-sharing:** Information gathering alone can't prevent attacks. National agencies need to share what they know promptly with those at risk. Intelligence is vital for making more informed decisions regarding threat detection and prevention.

- **Reshape incentives to protect critical infrastructure:** Securing critical infrastructure from cyberattacks requires understanding the incentives of all the stakeholders in the cyber ecosystem. Mapping ecosystem interactions helps agencies trace influence lines to determine which actions and behaviors to incentivize or disincentivize.

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Government's role in scaling equity

Governments should pursue tangible equity through diverse measures, including leveraging technology, human-centered approaches, inclusive policies, and strategic partnerships.

Barriers and biases can sometimes crumble on their own, but more often than not, they require a nudge to come down. In the 1970s, a discrimination lawsuit compelled American symphony orchestras to conceal identities during auditions, with musicians playing behind a screen. The result: The proportion of women hired rose from 10% to 20% to more than 40%.[1] The transformative shift would not have occurred without the deliberate intervention.[2]

Governments should fulfill their mandate to serve constituents equitably, ensuring outreach to those who need assistance, while compensating for historical and current biases. Leaders should make deliberate choices and commitments to challenge established patterns and drive better outcomes by examining and redressing the biases often embedded in systems.

Globally, governments are increasingly focusing on reducing historical disparities, improving access to resources, and implementing regulations that promote a more just and equitable future. Within a single year, 90 US federal agencies devised first-of-their-kind "equity action plans," outlining strategies to overcome discrimination faced by underserved communities.[3] Similarly, the Accessibility for New Zealanders Act 2022 aims to identify and lower accessibility barriers so that people with disabilities can have equal opportunity to achieve their goals and aspirations.[4]

As governments advance their efforts around diversity, equity, and inclusion, leaders should focus on achieving tangible and significant results—measurable and meaningful outcomes with positive impacts on individuals, communities, and nations.

Breaking trade-offs

Striving to achieve equity should be sustained with continuous efforts, representing a commitment that spans generations. And as anyone in government who's tried to shift outcomes to be more equitable knows, the pursuit can pose considerable challenges. Implementing equity-focused policies at a time of tight budgets may shift resources between constituent groups, and no one is ever happy losing funding. Policies aimed at boosting one societal group may be viewed as disadvantageous for another. While the economic case for improving diversity and equity is well-documented,[5] striking an effective balance and avoiding discontent involve transparent communication, a better understanding of societal needs, and partnerships with the broader ecosystem.

Convergence: A key to 10x improvement in equity

Governments have an array of tools to advance equity in transformational ways in the short and long term. Technological innovations can help make services more accessible and user-friendly, while human-centered processes can prioritize the needs and experiences of all constituents, including diverse populations. Inclusive policies can help address historical biases and tailor solutions to meet individual needs, while strategic collaborations can help create networks and cultivate an environment that fosters equitable outcomes.

The key is convergence and the combination of these multifaceted tools at government's disposal. Government agencies are using a mix of tools to drive 10x equitable outcomes for all. Consider how combining different tools might have tangible impacts on people, workforce, and the vendor ecosystem:

- Human-machine teaming + digital reality scenario training tools + culture change = Overcome existing unconscious bias (read more below in the trend)
- Data-sharing platforms + digital infrastructure + outcome-based contracting = Promotes diversity in procurement
- Human-centered design + customer journey + policy reforms + public-private partnerships = More inclusive talent pool

Figure 1

By the numbers: Government's role in scaling equity

London

has the world's most accessible bus network with **9,000 wheelchair-friendly buses** and **17,000 stops.**

Bangladesh's

a2i digital transformation program, established over 9,000 digital centers, **that supported over 6 million citizens** a month by providing them access to multiple digital services.

Tanzania's

digital birth registration boosts coverage for children under five, **saving families about US$24.8 million annually** by eliminating the need to travel to district registration centers.

New York City's

Project Reset, a diversion initiative that assists individuals to avoid court and criminal records, **has benefitted more than 6,000 participants,** with a 98% **completion rate.**

Source: WheelchairTravel.org, "London public transport," accessed February 2, 2024; Ming En Liew, "Synthesis report," UNICEF, accessed February 2, 2024; GovInsider, "India's journey to inclusive, accessible and safe digital services," November 15, 2023; Center for Justice Innovation, "New York State joint legislative budget hearing," February 7, 2023.

Trend in action

Building an equitable future requires systemic change and continually adapting policies, regulations, and services, ensuring they remain balanced and accessible.

By focusing on three primary spheres of influence within government organizations—communities and society, vendor ecosystems, and the workforce—governments can advance equity within and outside their agencies.

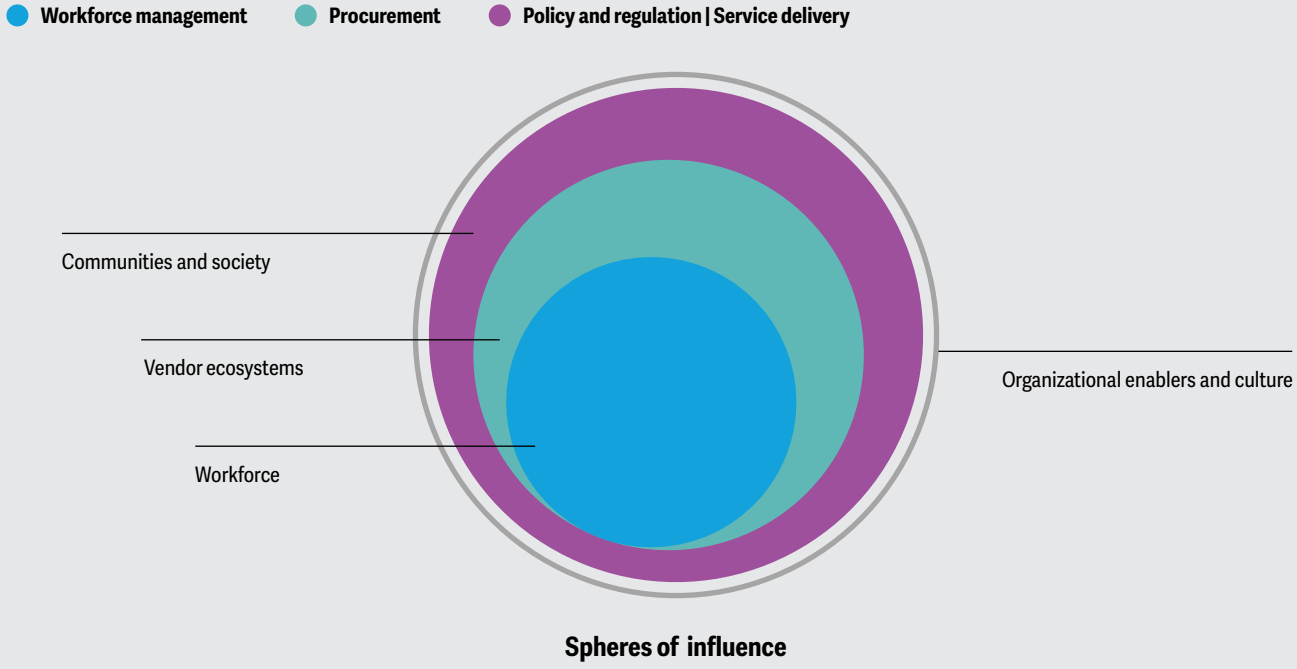
- **Communities and society.** Equity in service delivery and access to health, housing, education, infrastructure, justice, and other public services.
- **Vendor ecosystems.** Equity around procurement, grants, and contract opportunities.
- **Workforce.** Equity in government workforce across dimensions such as hiring, training, and career growth or promotion opportunities.

Communities and society

Governments are making strides to provide more equitable and inclusive services to their constituents and assisting vulnerable populations. Access to essential services such as education, transportation, health care, and affordable housing should be considered fundamental. However, these services are often elusive for

Figure 2

Governments are focusing on three primary spheres of influence—namely, communities and societies, vendor ecosystems, and the workforce—to advance equity



Source: Kimberly Myers, Kelly A. Batts, Shrupti Shah, and William D. Eggers, "Government's equity imperative: The path toward systemic change," Deloitte Insights, September 14, 2021.

low-income populations, underserved communities, previously incarcerated individuals, racially and ethnically diverse groups, and others due to factors such as location, language barriers, and limited online access.

Additionally, confusing eligibility rules, cumbersome processes, and complicated forms can make it challenging for individuals seeking to apply for public benefit programs, such as those that offer food, social services, education, training, and housing services. Equitable access should include efforts to make these services accessible to every eligible constituent.

Prioritizing equity in policymaking. Government policymakers should look to design, implement, and evaluate policies through an equity lens. The United Kingdom's Public Sector Equality Duty requires agencies to conduct equality impact assessments to understand the impact of new, existing, or replacement policies or practices in the public sector.[6]

Methods and approaches to user engagement have evolved in service delivery design, delivery, and evaluation, with leading organizations converging on coproduction to enhance equity and responsiveness. In the United Kingdom, the National Expert Citizens Group connects those with lived experiences in areas such as homelessness, mental illness, addiction, domestic abuse, incarceration, neurodiversity, and poverty with parliamentary committees, government departments, and decision-makers; agencies consult the group on national policies and programs.[7]

Countries have various laws and processes to break down historical barriers people face. Take individuals with criminal records, for instance: Some US states permit individuals to seal or clear their records after a certain crime-free period, but due to the inconvenient and complex nature of the process, only a fraction of eligible individuals take advantage of it.[8] Michigan, however, has made its process free and simple by automating expungement of criminal records for over a million residents in 2023.[9] Other states are following suit: This year, New York is set to introduce an act to automatically seal records to provide equitable second chances to those reentering society.[10]

Advancing equity through better digital services. Government agencies are taking steps to simplify online portals and develop more dynamic and user-friendly interfaces. The Commonwealth of Massachusetts has appointed a new position, chief IT accessibility officer, a role responsible for improving the accessibility of the state's digital services. "This role is especially meaningful for me since working toward accessibility for everyone has been a driving passion of mine as a person with a disability," asserts Ashley Bloom, the Commonwealth of Massachusetts' chief IT accessibility officer.[11]

Governments are also striving to enable equitable digital access by adopting new tools and collaborating with different partners. A free online tool helps new parents and caregivers in New York State determine whether they are eligible for paid family leave and how to apply for it. "You can use technology to close the equality gap ... it can make the world a little bit better," states Reshma Saujani, founder of the nonprofit Moms First, who also built this app.[12]

By building the supporting digital infrastructure (see "Building more equitable and inclusive government services and programs through digital identity") so no one is left behind, governments can help boost equity and inclusion. One of the benefits of enhanced digital self-serve capabilities is the enhanced capability to divert more intensive supports to higher-need clients, which may improve access for underserved clients.

In some cases, the path to advancing equity begins with examining how different types of constituents interact with agency systems, whether onscreen or on paper, and exploring where unseen barriers might be hindering people from using services to which they are entitled. Other times, agencies should look to sensitize and train staff to be more mindful of diversity and equity–related issues; unconscious bias can cause unintended consequences and affect service quality and overall agency mission outcomes.

Addressing unconscious bias and profiling in policing. Bias makes police work less effective, corrupts data systems, and reduces both public trust and community willingness to cooperate with law enforcement.[13] To overcome unconscious bias and ethnic profiling, the

Dutch national police force provides officers virtual reality (VR) training involving immersion in scenarios such as mass street protests.[14] The officers are asked to engage with VR citizens to detect criminal activities. While early results showed that officers often act based on their own biases, mistrust, or ethnic background, training exercises in this immersive environment have generated measurable results.[15] More than 10,000 police officers in Belgium, Germany, and the Netherlands have completed training to help them gain knowledge, become more resilient, and promote quality police stops while avoiding ethnic profiling.[16]

Canada is also actively working on building strong connections between the police and the community. With a focus on helping officers recognize and overcome biases, the Longueuil police force offers a five-week intensive, immersive training program, in which officers—without their uniforms and firearms—engage with community members at schools, community centers, places of worship, and even homes. This approach gives officers a chance to bond with individuals from various cultures, community groups, and families within their jurisdictions.[17] If users and constituents are involved in the design or delivery of services, agencies may be more likely to identify and weed out bias.

Increasing accessibility. Leaders increasingly recognize that individuals have varying needs and experience systems and services in different ways; one in six people worldwide experience significant disabilities and often face multiple challenges while accessing government services.[18] Many agencies are now prioritizing the transformation of their programs to deliver more inclusive and equitable services by designing solutions tailored for specific needs.

Accessible transportation can be particularly important for expanding social and economic opportunities, but it can pose challenges for specific groups, such as people with developmental disabilities.[19] Agencies worldwide are leveraging smartphone apps and other technologies to make public transit more accessible for people reliant on these services.[20]

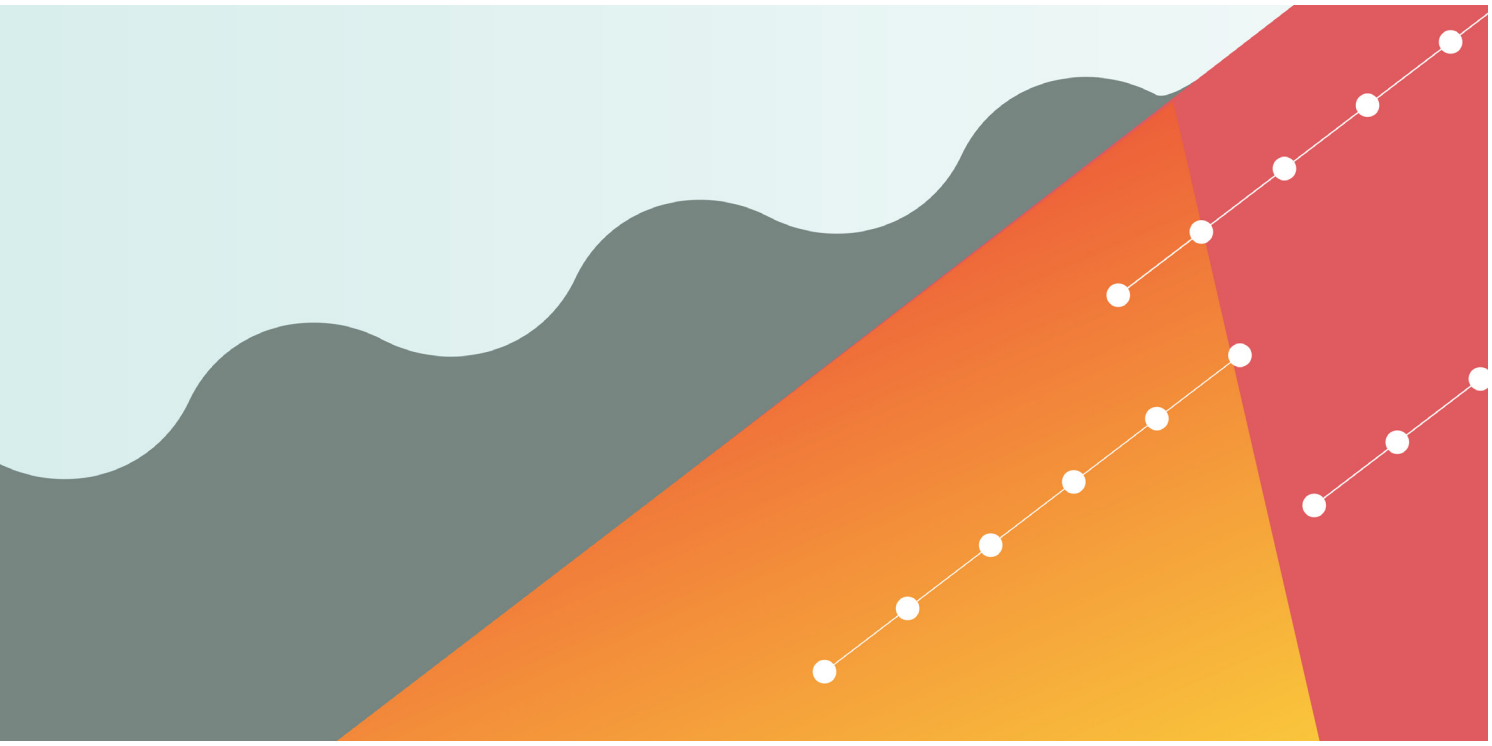
To make air travel more accessible to people with disabilities, several US airports provide multisensory rooms—comforting spaces, with soothing colors and calming music, where families can relax before boarding.[21] Pittsburgh International Airport has a room fashioned like an airplane cabin with overhead compartments, windows, chairs, and trays for kids and adults to get used to sitting on a plane.[22] Airports in Canada are taking an additional step forward by offering pretravel "rehearsals" for children with disabilities to familiarize them with airports and planes. In April 2023, the Aéroports de Montreal Premium Kids program had 200 participants who experienced the entire airport journey, from arrival at the parking lot, checking in, and going through security, to boarding the airplane and listening to in-flight safety instructions.[23]

Vendor ecosystems

Government agencies are increasingly making deliberate efforts to engage a more diverse range of vendors in government procurement. Research suggests that an inclusive procurement strategy not only widens the supplier base but also boosts supplier competition, which can help increase quality, lower costs, and support the development of more agile and resilient supply chains.[24] Additionally, better community representation in vendor ecosystems can bolster trust in government agencies.[25]

In a previous study, we examined the subcontracting relationships of the 12 largest defense contractors in Huntsville, Alabama, and found that while minority-owned companies made up 29% of businesses in the sample (on par with 27% of all Huntsville businesses being minority-owned), they received only 8% of all subcontracts and 4% of all subcontracting dollars awarded.[26]

Increasing diversity in contracting. The US government is pushing to increase contract spending on small, disadvantaged businesses by 50% in the next five years. In May 2023, the White House and General Services Administration launched two tools to help connect government buyers with diverse vendors.[27] The Governmentwide Procurement Equity tool allows government agencies to identify small businesses, vendors that meet specific socioeconomic categories, and those new to the government market.[28] Further, the Supplier Base Dashboard is accessible to both vendors and the



public to help track and analyze critical information such as the number of vendors in business with an agency, their size, socioeconomic status, and whether they are new or established in the marketplace.[29] "By providing our federal partners with more information when they make procurement decisions, we're better able to set ourselves up to achieve our contracting goals and create more equity in the marketplace for everyone," says GSA Administrator Robin Carnahan.[30]

Specifically, these tools aim to advance access to procurement for women-owned small businesses, service-disabled veteran-owned small businesses, and small businesses in historically underutilized business zones.[31]

Promoting gender-inclusive procurement. To promote gender-inclusive economic growth in India, the Government e-Marketplace, a digital platform for government procurement, launched Womaniya, a unique program for women entrepreneurs to sell directly to government buyers.[32] More than 140,000 women-run small enterprises are registered on Womaniya and have completed orders worth a total of over US$2.5 million.[33]

Similarly, the Western Australia government added a gender-equality clause in its public procurement process as part of a 12-month pilot: Suppliers applying for government contracts must prove compliance with the clause. "This initiative will use the purchasing power of the state government to ensure companies are playing their part to address gender inequality in the workplace," says Women's Interests Minister Simone McGurk.[34] The pilot advanced gender equality with a compliance rate of above 90% among large suppliers.[35]

Agencies should work to understand the barriers to entry for target businesses and gather feedback from them to shape how to best support and engage with those businesses in the future.[36]

Workforce

Government leaders are also working to address inequities in their own organizations. As of 2022, every functioning parliament in the world has women representation; in 2023, women held 26.7% of legislative seats around the world, up from 15.3% two decades

earlier.[37] Gender diversity stretches to employment as well: The proportion of women in Japan's national civil service reached a record high of 38.7% in 2022–23.[38] Japan plans to launch a website visualizing the wage gap between male and female employees working in the central and local government. By making this data public, the government aims to reduce the gap and boost female employment.[39]

Over the last few years, the United States has also seen increased representation of LGBTQIA+ communities in public office, which rose by 13.6% between June 2022 and May 2023. Similarly, elected officials who were racially and ethnically diverse rose roughly 23% in 2023.[40]

Increasing workforce diversity. A diverse workforce can help improve decision-making, engagement, and innovation, bringing to the table unique opinions and perspectives on critical issues. Social Security Scotland aims to enhance workforce diversity by hiring people with disabilities as client advisers to assist applicants in understanding the benefits they can access. The agency established a team that collaborates with organizations supporting disabled individuals to gather input on accessibility and application formats, improving the recruitment process. For a 2018 job hiring, the team promoted job opportunities and highlighted, through outreach, that applicants would receive support throughout the hiring process; it reached out to candidates who identified as having a disability and were contacted for an interview to understand whether they needed additional support or other adjustments to ensure a fair process. The agency also removed degree criteria for entry and replaced it with tests of candidates' literacy and numeracy.[41]

Widening access to public sector jobs by focusing on skills. In the United States, degree requirements for government jobs can exclude workers without college degrees, who make up the majority of American labor force. Skills-based hiring can provide more access for those who are "skilled through alternative routes" such as technology boot camps, community colleges, or prior work experience, and allow them to work in the public sector. Federal agencies, as well as 14 US states (and counting), have taken steps to move toward skills-based hiring practices to expand the talent pool for public sector jobs.[42] The state of Maryland loosened requirements for formal education in more than half of its 38,000 roles, helping state agencies grow the talent pool in a tight labor market, with the goal of "leaving no skilled worker behind."[43] There are early signs of success, with a 41% increase in state government hires without a degree and a 14% increase in the number of state employees hired overall.[44]

Dr. Pramod Varma, former chief architect of Aadhaar and India Stack, and chief technology officer, EkStep Foundation[45]

My take

Building more equitable and inclusive government services and programs through digital identity

In a country of over a billion people, less than half the population held bank accounts in 2011. By 2017, we had brought 80% of the population into the formal banking system. A milestone that could have taken five decades to accomplish was reached in less than one decade. Multiple factors contributed to laying the foundation for an inclusive and digital future for India.[46]

The first building block was Aadhaar, a unique digital identity program launched in 2009. The 12-digit identification number authenticates an individual's identity and has been instrumental in fostering equitable and inclusive growth in the country. Today, it is the largest biometric identity program in the world, with 1.39 billion Indians enrolled in the program having about 1.8 billion authentications every month.[47]

Given the know-your-customer requirements for banks, identity was a key first step in improving financial equity, but it was not the only step. Supportive government policies such as the Prime Minister's Jan Dhan Yojana led to the universal spread of bank accounts in the country, with about 500 million new bank accounts opened under this scheme.[48] With bank accounts in place, India's digital payment infrastructure allowed for payments to be made and received instantly between the government, businesses, and people. For those with no device of their own, the Aadhaar Enabled Payment System helped Indians in the remotest of areas with equitable access to banking and financial services. This system enabled doorstep banking services through micro-ATMs, which helped scale financial inclusion efforts. As of July 2023, more than 17.52 billion transactions were carried out through the system.[49]

In 2013, India launched Direct Benefit Transfer (DBT) to transfer cash benefits from different schemes directly into Aadhaar-linked bank accounts more efficiently. The COVID-19 pandemic was the first big test for us when the central government decided to use DBT to send money directly to these accounts. The Aadhaar technology ecosystem and underlying digital public infrastructure ensured such large transactions were carried out seamlessly in the back end and the government was able to transfer US$3.9 billion to 318 million beneficiaries during COVID-19.[50] Today, India runs the world's largest DBT program.[51]

Besides financial inclusion, Aadhaar unlocks a range of public and private services for citizens and ensures everyone has the opportunity to access government services and benefits. Over 1,700 state and central government programs rely on Aadhaar to deliver government benefits and services.[52]

Take for instance the cooking gas subsidy, which is also the world's largest cash transfer program.[53] The government pays a liquefied petroleum gas subsidy through DBT to Aadhaar-linked bank accounts, streamlining the subsidy transfer process and making it easier, hassle-free, and more targeted. It ensures that the benefits reach the intended recipients efficiently. Aadhaar infrastructure has also been embedded into various other government services, improving the quality of life for the poor and marginalized.

So, what's the secret behind India's digital public infrastructure success? It's minimal design simplicity and interoperability model. India's story is an example of how the coordinated efforts of a well-designed system can support a country's diverse needs and truly transform the lives of a billion-plus people.

What the 10x future holds

- **Equitable outcomes as a core component of policy formulation**: This helps address historic barriers and prevent their perpetuation. Policies and laws should be updated to reflect changing circumstances and individual needs, especially in cases in which existing ones pose barriers to access.

- **Simplified access to government services**: Governments are improving access to services by making it easier to navigate the systems, reducing complexity, and cutting red tape. US government's FAFSA Simplification Act overhauled the federal financial aid process. Today, with process improvements and technology adoption, college-bound students can apply online for financial aid via a 10-minute digital interaction.[54]

- **Personalized programs for different groups**: Advances in digital technology enable agencies to tailor services to constituents' diverse needs.[55] Singapore's LifeSG app connects more than 40 government services designed to be more accessible to its aging population, with translation features in four official languages and a module to help seniors stay active, healthy, and socially connected.[56]

- **Diverse talent pipelines for the future**: By reevaluating degree requirements, adopting flexible work arrangements to break down geographic barriers for certain jobs, and revisiting hiring practices and processes, governments are working to build more diverse workforces.

- **Configuring benefit portals to update constituent records automatically**: These portals reflect current life events, reducing the need for multiple user inputs. Emerging digital technologies are expected to play a role in automatically applying, verifying eligibility criteria, and expediting the approval process.

Steps governments can take now

- **Apply technology and human-centered design to streamline processes**: Governments can simplify the benefits process by building dynamic and user-friendly interfaces for online portals that reflect human-centered design principles.[57] At the same time, they should align services with intensity of needs through mechanisms to prioritize those requiring urgent assistance.

- **Codesign and coproduce services and solutions**: In the process of designing and delivering programs and services, agencies should include underserved communities and racially and ethnically diverse groups, as well as those with diverse lived experiences. Tracking and measuring the impact of policies and programs designed to advance equity can help inform future decisions and policies.

- **Make deliberate efforts to build a more diverse talent pipeline**: Agencies should work to attract young talent from diverse backgrounds, mentoring individuals from systemically marginalized communities and women candidates and using data to track diversity and inclusion efforts.

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10x improvement in customer experience

Combining digital public infrastructure like digital identity with tools like human-centered design can help governments significantly enhance customer experience.

Modern governments do a lot. They provide education, they build roads, they maintain public safety, and much more. But for many people, their view of government is shaped by their individual experiences of specific, individualized services that governments provide to them. In recent years, and partly inspired by strong progress in the private sector, governments have increasingly rallied around a mandate to deliver excellent customer experience. While the private sector has found that keeping customers at the center of their operations improves their overall performance, similar realization is taking root in governments.

Our picture of government is often our most recent experience waiting in line at a department of motor vehicles or filing a tax form or calling to ask about the schedule for local recycling collection. Citizens, long used to a seamless and frictionless experience in the private sector, tend to expect the same from government organizations. A Deloitte 2023 survey of 5,800 individuals across 13 countries found that customer satisfaction from digital government services is 21 percentage points behind the private sector. However, if governments can enhance customer experience, it can be more than just a benefit to customers; it has the potential to fundamentally improve the relationship of the public to its government. In fact, our research has shown that perceptions of government customer experience are a good predictor of trust in government.[1]

Historically, improving customer experience has been a cumbersome and expensive process. Updating forms, developing technology systems, streamlining processes, and adding staff are all costly and time-consuming. Today, a range of tools offer possibilities to improve customer experience faster and more directly. From businesses applying for licenses online to individuals using a digital ID to access welfare benefits, digital services are helping governments provide human experiences that are efficient, inclusive, and address citizen needs.

Governments now have compelling enablers for excellent customer experience

Deloitte's global research has found that digital public infrastructure (DPI) is one of the most effective tools to bring radical improvements in customer experience. DPI is a suite of standards and platforms—such as digital identity, digital payments, and data exchange systems—that helps governments deliver essential services to citizens at scale. DPI is also a philosophy based on open,

networked technology that serves the public interest. It is supported by communities that are robustly incentivized to innovate for the public good.

DPI has the potential to make services seamless. It can simultaneously cut costs, deliver inclusive services at scale, and foster innovation. DPI represents rails on which user-friendly products and services are built. This infrastructure has the power to reshape aspects of entire economies—and leave them more resilient. DPI has been shown to empower people, especially in remote and underserved areas, with access to essential services like health care, education, and financial services.[2] It can also empower ecosystems of innovators to help make government services better.

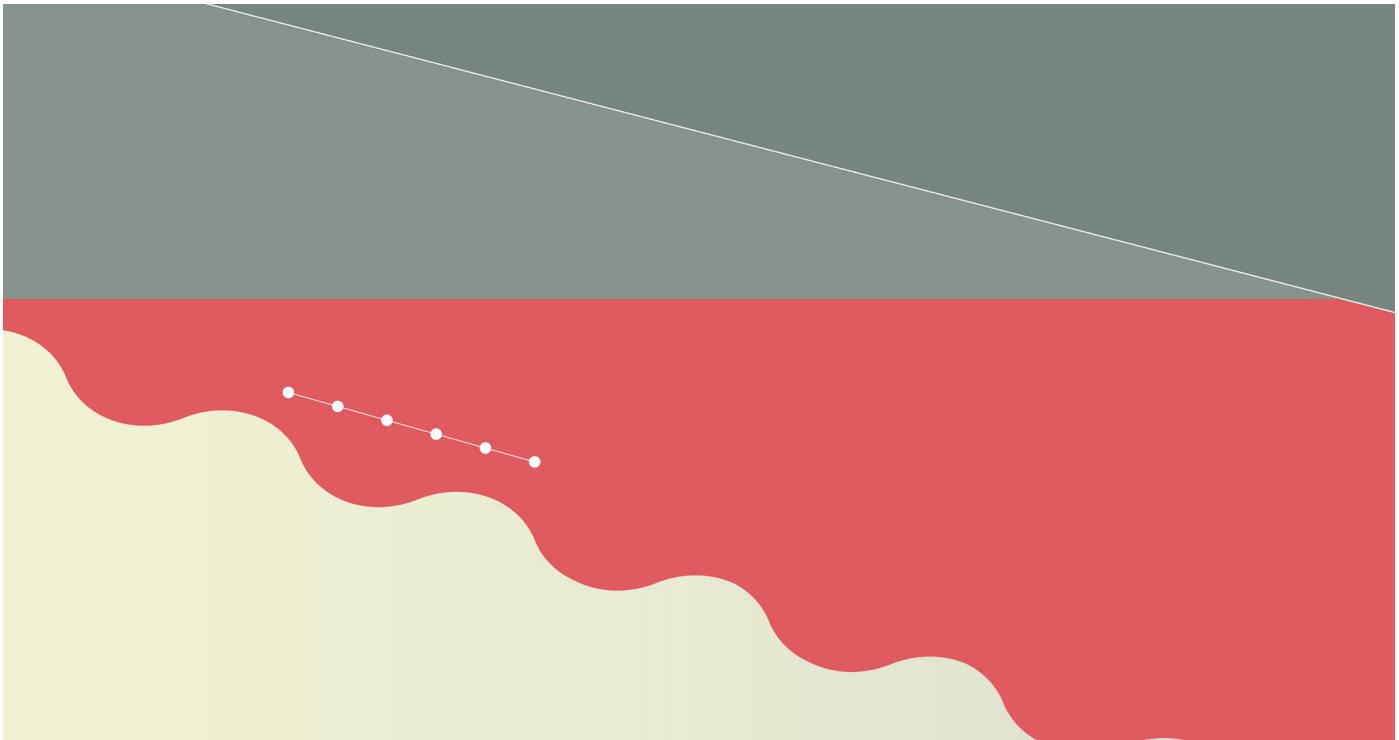
The interoperable and reusable building blocks of DPI—including digital identity, payments, and data exchange—combine in a myriad of ways. They provide a groundwork on which to build customizable approaches suitable for governments of all sizes. Further, with a shared platform for hundreds of digital services, governments can avoid creating a patchwork of fragmented online services, transform more efficiently, and structure themselves to systematically prioritize how end users experience their services.

Governments can also benefit from other **enablers for customer experience** beyond DPI. For example, human-centered design has gained popularity; increasingly public servants understand how to apply design techniques to effectively imagine and create compelling service experiences.

Governments have also made significant progress in adopting structures to promote customer experience, including by creating chief customer experience officers in key agencies. And perhaps most importantly, governments have seen excellent progress in debunking the value of some of the traditional barriers to great customer experience.[3] For example, while information technology has sometimes been seen as a high-risk, costly necessity, leading practices now allow IT to be fully symbiotic with investments in customer experience. Governments have made considerable progress building and adopting common technology enablers that they can build once but use repeatedly. Conducting user research, using agile methodologies, and incorporating iterative development processes not only improve customer experience but also help agencies mitigate the risk of costly technology failures.

Bringing customer experience to life

Ukraine's Diia app shows the potential of a well-established DPI for radically improving customer experience. The app was designed to make government services more seamless and efficient. Incorporating key DPI building blocks such as digital identity, data-sharing, and payments processing, as of 2024 the Diia app allows more than 19 million users to experience over 100 government services in fundamentally new ways.[4] The development of the app was essentially based on a presidential mandate to put government in everybody's pocket.



The app enables Ukrainians to obtain the world's first-ever digital passport, acquire a digital driving license, register newborns, file taxes, and transact with banks.[5] The platform has also proved remarkably adaptable. In the wake of the pandemic, the Ukrainian government used Diia to launch COVID-19 vaccination certificates. As the war unfolded, Diia streamlined payments for internally displaced persons. When homes had to be rebuilt after being damaged in the war, Diia launched its eRecovery service for convenient fund disbursement.[6]

Diia represents more than just digital for digital's sake. Improved customer experience built on DPI represents the future of how citizens could interact with their governments.

Breaking trade-offs

Traditionally, better customer experience required additional staff. Companies or agencies had to hire more call center workers, more social care workers, and more tax processers. Even with costlier additional resources, there was no guarantee that the benefits would extend to all citizens.

Digitally connected populations change that math. Governments can provide services directly through digital platforms. Citizens need not visit government offices to avail themselves of government services; the services are available wherever and whenever citizens can connect. These efficiencies also extend to people who prefer not to connect digitally—even people phoning, mailing, and visiting agencies benefit from public servants who have better tools to process and manage analog transactions. **DPI-enabled customer experience can break the traditional trade-off between service and cost.** In this context, thoughtful designers, strategists, and technologists have an unprecedented suite of tools to provide exponential improvements to customer experience.

Seamless service delivery relies on DPI's role as a digital backbone that facilitates digital interactions with government. DPI's interoperable, reusable, and open-source technologies can reduce cost, increase efficiency, and eliminate the need to develop custom technology for every digital service. These improvements allow staff to do more with less. Moving up the technology stack creates efficiencies in service delivery. It also allows staff to segment their customer base by those seeking or requiring no-touch, low-touch, and high-touch experiences based on customer needs. For example, Deloitte's 2023 survey revealed only 17% of surveyed individuals aged 55 and above engaged with governments digitally regularly. Lower administrative burden and better understanding of the customer base can help public servants to deliver more personalized human attention to more people who want it and provide self-service digital services to others. This approach leads to better customer experience without enhancing resources proportionately.

Convergence: The key to 10x change in customer experience

Better customer interactions not only reduce the "time tax," that is, the time taken to access government services, but also build goodwill toward future interactions with the government.[7] Achieving a 10x improvement in customer experience involves leveraging a combination of tools in addition to DPI. Governments are actively investing in digital infrastructure to ensure universal access to digital services, including initiatives such as broadband expansion, public Wi-Fi zones, and digital literacy programs.

To build, operate, and use DPIs, government agencies should take a human-centered design approach, establish shared governance processes and standards, and work with the technology ecosystem to make full use of emerging technologies. This harmonious medley of the right tools, technologies, and policies can result in tangible and measurable improvement in customer experience. Here are examples of simple frameworks for conceptualizing the potential impact of DPI:

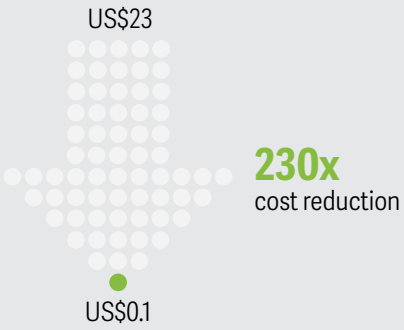
- Data-sharing + public-private partnerships + data governance = Personalized customer experience at lower costs
- Digital infrastructure + participatory policymaking + shared incentives = Innovative customer-centric solutions
- Machine learning + robotic process automation + data exchange = Predictive customer journey mapping

Better customer interactions not only reduce the "time tax," that is, the time taken to access government services, but also build goodwill toward future interactions with the government.

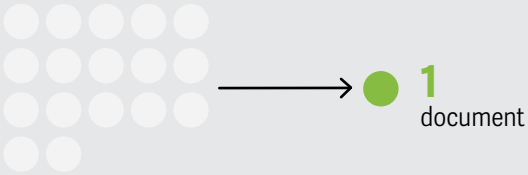
Figure 1

By the numbers: 10x improvement in customer experience

Indian banks' cost to conduct e-KYC has **decreased** from **US$23** to **US$0.1** after use of Aadhaar—a 230x improvement.

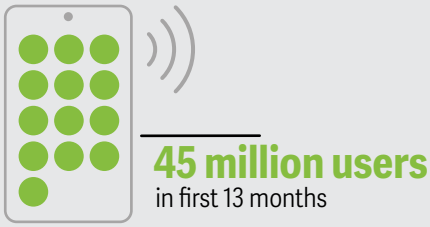


Türkiye **reduced** the number of documents required for applying for social assistance program from **17** to **1**.



99.99% of births and related birth allowances are auto-checked and auto-paid in Estonia with a **91% satisfaction rate** and an 88% reduction in parents contacting government workers for benefits.

45 million users made their first-ever direct fund transfer on Pix, Brazil's digital payment system, within the first **13 months** of its launch.



Sources: Vikas Kumar, "'47 years target met in 6 years': World Bank praises India's digital public infrastructure," *Economic Times BFSI*, September 8, 2023; World Bank, *G20 policy recommendations for advancing financial inclusion and productivity gains through digital public infrastructure*, 2023; World Bank and Republic of Turkey Ministry of Family and Social Policy, "Turkey's integrated Social Assistance System," accessed January 2024; Nortal, "Estonia moves towards a seamless society with proactive public services," October 3, 2022.

Trend in action

Although varying from country to country, common DPIs include digital identity, digital payments, and data exchanges. Like any other interoperable technology, the power of DPI comes from combining these three blocks. Together, DPIs enable governments, the private sector, and non-profits to build services and functionalities on top of DPI building blocks. Even though DPI is "public," it most effectively realizes its full potential when it is supported by an active ecosystem, including an innovative private sector that uses and supports DPI as a fundamental tool to develop new business models and make existing business services more accessible.

Understanding the building blocks of better customer experience

DPI serves as the foundation upon which to build user-friendly digital products for large populations. There are three major components to DPI that can help improve customer experience: digital identity; digital payment, and data exchange.

Digital identity: Being able to prove who you are—using an authorized identity—enables people to receive secure government services and participate in the digital economy. Leading practices focus on self-sovereign identity that allow individuals to control their personal data. These approaches focus on empowering verifiable entities to engage in trusted transactions. Several countries have launched digital ID projects, none bigger than India's. The country's journey to develop DPI began with Aadhaar, a 12-digit unique digital identity that serves as the verification of a person's name, address, date of birth, and gender.[8] Aadhaar serves as the cornerstone of a system that delivers public welfare schemes to farmers, the elderly, and underprivileged residents, among others. Aadhaar also offers secure authentication for services offered by the private sector. These range from banking, to insurance, to telecom needs like setting up a new internet connection.[9] Linking Aadhaar with bank accounts helped India directly deposit cash at an unprecedented scale and speed during COVID-19. The government of India directly transferred US$3.9 billion to 318 million beneficiaries within two weeks of announcing cash transfer program during the pandemic.[10] Aadhaar has facilitated nearly US$400 billion of direct benefit transfers to date, and in the last five years, the government has processed more than 27 billion beneficiary transactions through Aadhaar. Over the fiscal year 2022 to 2023 alone, the direct benefit transfer schemes transferred cash to over 730 million beneficiaries.[11] As of March 2022, direct benefit transfer had resulted in a cumulative savings of US$33 billion, equivalent to nearly 1.14% of India's gross domestic product.[12]

Digital payments: Digital payment systems enable governments, individuals, and businesses to transact securely and easily. Unlike digital IDs, multiple digital payment systems can act as DPIs as long as they are interoperable. Generally, these systems collect and deliver payments instantaneously and work around the clock. India's Unified Payment Interface (UPI), Brazil's Pix, Europe's TARGET Instant Payment Settlement, US's FedNow, and Türkiye's The Instant and Continuous Transfer of Funds System are some examples of interoperable DPI payment systems. Launched in November 2020, in its first 13 months, Brazil's Pix had 109 million individual users and more than 7.6 million businesses. The numbers include 45 million users who did not have access to digital financial services before Pix.[13] In India, for the fiscal year from 2022 to 2023, the total value of UPI transactions was nearly 50% of the country's nominal GDP.[14] Such payment systems can improve financial inclusion in a country and help government transfer instantaneous cash benefits to underserved community.

Data exchange: Data exchanges connect disparate systems, including identity and payment. Data exchange systems enable the seamless, secure, and consent-based sharing of data between governments, individuals, and businesses. Data exchanges are important to resilient service delivery and can be pivotal in a crisis when speed is often paramount. World Bank research during COVID-19 found that countries with digital data exchange platforms, on an average, were able to reach 51% of their population for cash transfer; in contrast, the ones without it were able to transfer cash to just 16% of the population.[15] Data exchanges also play a key role in implementing the *once-only* principle, which asserts that citizens should only have to give their information to the government once.

Government agencies, in turn, should bear the responsibility of sharing data in appropriate and privacy-respecting ways. To the extent permitted by law and policy, data exchanges enable multiple agencies to share data and insights from their data, to avoid burdening individuals and businesses with repeatedly entering the same information. Such DPIs may also allow private service providers access to data to offer a range of financial, health care, and educational services to individuals. For example, an applicant for a loan could authorize the government to send tax data to the bank. DPIs used to share personal data can secure informed consent, establish personal data protection, and provide trusted data-sharing mechanisms. Data exchanges can even include a public-facing component for non-personal data, helping them meet their goals with regards to open data.

Europe's "once-only technical system" enables public authorities of various countries to exchange information across the border.[16] Ukraine's data exchange platform, Trembita, has facilitated more than 3 billion data-sharing transactions since its launch in 2020.[17] The platform is named after the Ukrainian word for a wooden horn, the term used by highlanders to call people to congregate for occasions like births, weddings, and funerals. Just like the horn, the data platform acts as a means of communication, albeit digitally, between Ukrainians and 201 state and local bodies.[18] Trembita is modeled after Estonia's pioneering X-tee data platform, which is used by 1,200 organizations, facilitates 2.2 billion transactions annually, and supports 3,000 online services.[19]

Combining building blocks to improve customer experience

Building and deploying DPI takes more than simply rolling out individual building blocks of digital identity, payment, and data exchange systems. It is about designing them in such a way that the building blocks are interoperable to allow services to develop using DPI as a foundation. DPI is an intermediate layer of the digital ecosystem. It sits on top of traditional physical technology layers (servers, data centers, devices, and routers) and supports front-end app layers like telehealth, social care, cash transfers, and e-learning. DPI can also be supplemented by additional platform services that create efficiencies and harmonize customer experience such as artificial intelligence–enabled chatbots for answering queries or auto-filling forms.

The direct benefit transfer program in India provides an example of how the building blocks of DPI combine to deliver services in a new way. Aadhaar provides the identity layer, which connects to a data layer to identify whether an individual is eligible for a welfare program.[20] The payment infrastructure, Aadhaar Payment Bridge, maps an Aadhaar identity onto an individual's bank account to complete a direct deposit. Individual DPIs won't suffice, but the interoperable nature of DPIs enables the systems to communicate together to complete the task.[21]

Estonia, another leader in interoperable and reusable DPIs, used them to remove extraneous information requests from the citizen's experience.[22] Before 2019, 97% of Estonian parents had to apply for one or more of 10 types of family benefits available when a child is born. To receive the allowance, parents would fill in the required details and supporting documents for each benefit. Officials would study the forms, calculate the benefits manually, and then grant them. It took about two hours for officials to process each application.[23]

In October 2019, Estonia's Social Insurance Board launched a proactive family benefit service where parents don't even have to apply in order to receive family benefits, making it a *frictionless* experience. The Social Insurance Board developed an automated IT system that sends a nightly query to the Estonian National Population Register via X-tee (their data exchange DPI) for data on new births. Based on the digital ID of parents, other registries, like the Tax and Customs Board, share data to determine who is eligible for which benefits. The system follows the principle of *once-only* by *not* reaching out to parents for information it already has.[24]

After collecting all of this information, the Social Insurance Board proactively populates the benefits data on the family's self-service portal. Once parents hit the confirm button, the money is automatically transferred to their accounts. The process now takes just 30 seconds. As of 2023, 99.99% of births in Estonia were automatically checked for eligibility. The result: a 91% service satisfaction rate and 88% reduction in need for parents to contact government workers.[25]

Türkiye experienced similar benefits after it implemented its Integrated Social Assistance System (ISAS). ISAS integrates data from 22 public bodies and offers 112 digital services. Before ISAS, a paper-based application system required 17 documents related to land, vehicle, and tax registration. ISAS integrates citizen's unique ID with personal information like financial status, household income, work status, and ownership of property, agricultural land, and vehicles. Integration reduced the required documents from 17 to just one—a national ID number. Thanks to this system, application time has fallen from days to minutes. Processing and benefit delivery time has been cut from months to days.[26]

Government doesn't need to do it all

The size and scale of DPI can be intimidating. After all, even the biggest corporations in the world don't need to authenticate the identities of more than a billion "customers" as India's Aadhaar does. But governments do not need to build and manage every DPI tool themselves. A wide ecosystem of partners opens access to needed technologies and speeds user adoption.

Governments can find partners who already have existing solutions that fit their DPI needs. Often, this means finding "where your users are." If the bulk of a user group communicates on a messaging app, you may not need to create a stand-alone app, but rather can incorporate a chatbot into a messaging app. Similarly, many governments are using existing commercial identity solutions as part of their digital identity block of DPI.

But commercial and non-profit partners can also benefit from and contribute to DPI. DPIs can enhance efficiency and cut down operating costs for private organizations. The ability of business to verify customers remotely, for example, simplifies verification and can improve the experience for customers.

In India, banks and other financial institutions have been significant beneficiaries of DPI. The cost to onboard a customer in India has come down from US$23 to US$0.1, a 230x improvement.[27] This can create a positive feedback loop that benefits government, where DPI makes business easier, which attracts more users, which in turn, creates greater social benefit. For example, implementation of various DPIs have played a critical role in improving financial inclusion in India. The country's bank account ownership, which was 25% in 2008, jumped to 80% a decade later. That journey would have taken nearly five decades if not for DPI.[28]

Luukas Ilves, chief information officer and undersecretary of digital transformation, Estonia

Kaili Tamm, chief digital officer, Ministry of Economic Affairs and Communications, Estonia[29]

My take

User-centric technology in Estonia helps deliver seamless services to citizens

Digital government is not new to Estonia. We started our journey almost three decades ago but, with a goal of improving services for the public, we are still driven to progress.

Estonia's digital government ecosystem has benefitted from the fact that we focused on two key items early on: identity and data. Our national electronic identity (e-ID) system and X-Road data exchange layer have together positioned us at the forefront of efficient public service delivery, with almost zero marginal cost for creating new services.[29]

We believe in building ecosystems, both domestically and globally. Today, the X-Road (X-tee in Estonia) data platform is used by 1,200 organizations (the majority of which are private) and facilitates 2.2 billion transactions annually and supports 3,000 online services.[30] X-Road has even been implemented outside of Estonia in over 20 countries around the world.[31]

The combination of key technology elements with a digital ecosystem can produce real benefits for the public. Our focus is on building personalized services that are tailored to the needs of individual users and to minimize administrative burden. This builds on our current efforts to develop life events–based services. Take the birth of a child as an example. Utilizing X-Road, the system sends nightly queries to the National Population Register for data on new births, cross-referencing information from various registries through digital IDs, such as the Tax and Customs Board, to efficiently determine eligibility. This allows proactive delivery of financial benefits to new parents without the need for extra bureaucracy.

The same principles can improve services in other domains as well. For instance, in health care, personalized medicines can lead to a more proactive approach in identifying and reaching out to individuals with specific health risks. In education, we can start offering more tailored curricula.

Whether delivering benefits to citizens or registering a business, we believe the objective of digital government in Estonia is clear: to seamlessly combine technology and service delivery to maximize the benefit our people receive from public services.

What the 10x future holds

- **Leverage the power of DPIs to create seamless services:** Combining multiple DPIs like identity, payment, and data exchange platforms can help agencies deliver frictionless services. Citizens receive pre-filled forms based on accurate income data, streamlining filing. Use of AI ensures precise assessments, with real-time updates and notifications for timely submissions.

- **Personalized service delivery:** A service tailored to the individual's needs, interests, and circumstances, enabled by digital infrastructure, can enhance customer experience and put governments on par with the leading private sector organizations.

- **Predictive government:** Like leading e-commerce and over-the-top media platforms, governments collect enough data to understand and *predict* the needs of citizens. With interoperable and connected infrastructure and the use of AI, governments cannot only predict needs but meet them instantly.

- **Services for unplanned events:** As governments' digital infrastructure matures, agencies will not only be able to deliver life event services around predictable events like birth of a child or enrollment in higher education but also create resilient digital capacity that will enable agencies to stand up and deliver new services within days for unplanned events like pandemic or disasters.

Steps you can take now

To achieve 10x increases in customer experience, governments should consider:

- **Establish a modern data exchange:** New technologies can help lay the foundation for new customer experiences. Developing integrated data management systems can promote the once-only principle where customers need to provide information just once to use multiple services.

- **Invest in customer experience measurement platforms:** These platforms track an individual's experience to identify citizen needs and prioritize improvements to the customer journey. Better data drives better design, and better design drives citizen satisfaction.

- **Combine the use of AI with human centered design:** Integrate and use AI and generative AI with human-centered design principles to improve the customer experience and deliver personalized and accessible services.

- **Balance efficiency with privacy:** Strong foundational layers of DPI like identity, payments, and data-sharing help build trust and inclusivity among citizens. However, a reliable consent network is key to balancing government's need for efficiency with citizens' need for privacy.[32]

- **Embrace reusable technologies:** Reusable and modular technologies can help governments adopt and develop affordable and flexible technologies. Many of these technologies are open source and are designed to significantly enhance data interoperability, leading to an improvement in speed and scale of service delivery by leaps and bounds.

- **Build an ecosystem of users and partners:** Attract partners and users from the start. Governments should invite market players to develop services on top of DPI that attract users and help deliver inclusive scalable services.

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