

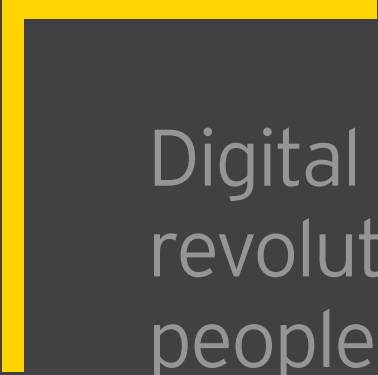
An aerial night view of a city, likely New York City, with a network of white lines overlaid on the image, suggesting a digital or data network. The city lights are visible, and the sky is dark. A yellow frame surrounds the main text.

**How does digital
government become
better government?**

■ ■ ■
The better the question. The better the answer. The better the world works.

The EY logo, consisting of the letters 'EY' in a bold, white, sans-serif font, with a yellow diagonal bar above the 'Y'.

Building a better
working world



Digital technologies are revolutionizing the way people live, work and interact. Governments must harness these technologies to completely reinvent their operating model, or risk becoming irrelevant. We examine the five critical areas they need to address.

The digital disconnect

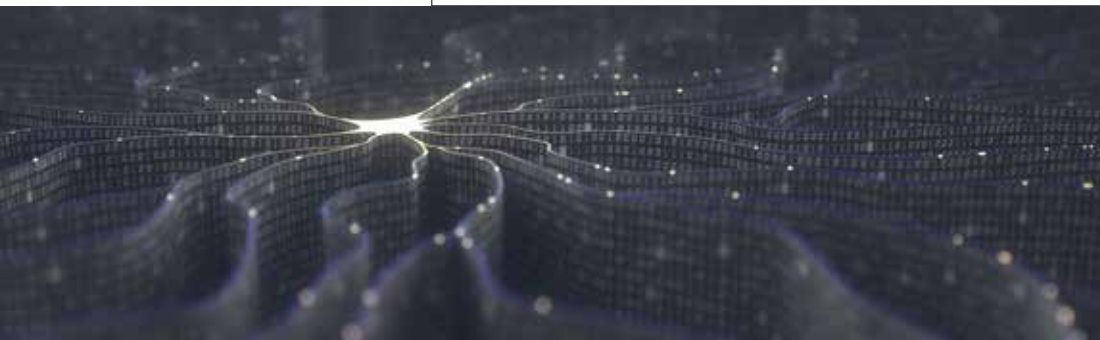
Digital technologies have the potential to deliver enormous benefits in the public sector, helping governments to:

- ▶ Understand their citizens better and deliver better outcomes
- ▶ Provide services more effectively and efficiently
- ▶ Find new solutions to policy challenges
- ▶ Engage with external partners to develop new delivery models
- ▶ Commercialize some public services and develop fresh sources of revenue

Governments that exploit digital technologies are also in a much stronger position to compete on the world stage, as Arnaud Bertrand, EY Global Advisory Leader, Government and Public Sector, points out. "Being at the forefront of digital government is a badge of prestige that can raise the global profile of a country or city and help create an economy that is a magnet for talent, enterprise and investment," he says.

And yet, despite all these opportunities, most governments are lagging behind the corporate world in harnessing the power of digital. A recent report from the World Economic Forum (WEF) labels governments "the dinosaurs of the digital age: slow, lumbering and outdated." And according to WEF's 2016 Network Readiness Index, which assesses digital advancement, the gap is widening between the growth in individuals' ICT use and governments' engagement in the digital economy.

¹ *Government with the People: A new formula for creating public value.*
Global Agenda Council on the Future of Government. World Economic Forum.
February 2017





“Digital transformation does not depend only on technologies alone, but also requires a comprehensive approach that offers accessible, fast, reliable and personalized services. The public sector in many countries is ill-prepared for this transformation.”²

Meanwhile, according to the 2018 Edelman Trust Barometer,³ trust in government to do what is right is lower than in any other global institution, at 43% (compared to 52% for business and 53% for NGOs).

Even where governments do make attempts to exploit digital technologies, many do not realize the intended benefits from their investments, and there are as many examples of costly implementation failures and cost overruns as there are tangible successes. The question is: if the gap between individuals and public services widens further, will the relevance and legitimacy of government as an essential part of functioning societies be irreversibly weakened?

To create a public sector that is fit for the future, government must reinvent itself. Digital transformation is not just about new technologies, but requires an overhaul of organizational structures, governance, work processes, culture and mindset. It also means moving from a narrow focus on ‘digital-by-default’ and ‘channel shift’ strategies to a much wider vision of potential relationships and business models that will redesign how public services function. Only then will governments capture the wider benefits that digital transformation can bring to people and society.

“Governments must change dramatically if they are to meet the challenges they face. Now, more than ever, the selection and deployment of digital technologies will determine how successful they will be.”

George Atalla

EY Global Sector Leader,
Government and Public Sector

² *United Nations e-Government Survey 2018.*

³ 2018 Edelman Trust Barometer <https://www.edelman.com/trust2017/>

Five critical areas for government digital transformation

Governments have a core mission to provide effective services for the people who need them, by making the best possible use of taxpayers' money. They must protect their citizens from harm, make sure workers are productively employed and give both individuals and businesses the 21st-century infrastructure and environment that are essential to success and a better quality of life. They must also mitigate the risk that digitalization could widen inequalities by investing in infrastructure in remote and disadvantaged areas, creating policies to improve digital literacy, and promoting digital inclusion for the most vulnerable.

If they are to deliver on this mission, governments have five critical areas to consider:

1. Customer experience

In the digital age, identifying and solving citizen pain points is not enough. Today's citizens expect public services to be as personalized and responsive as the services they get from the private sector. Governments need to reimagine how digital can be used to enhance the citizen's end-to-end experience of public services across all touchpoints, throughout their lifetime, including all those for which a government has direct or indirect control or responsibility. This requires the adoption of a 'citizen-first' culture and mindset in designing policies and delivering services. The ultimate goal is to improve service quality,

promote transparent and efficient interactions, enhance the level of public trust in government, and drive better citizen outcomes.

Social media and mobile platforms such as smartphones and tablets are replacing traditional channels (mail, phone, and computer) as a means to interact with government, report concerns and provide feedback. Mobile services, such as apps and SMS, enable people to access the services they need in a more convenient and targeted way. These e-participation tools also encourage greater collaboration with citizens by involving them in decision making, policy setting, budget prioritization, problem solving and the co-design of services. In turn, this helps to rebuild trust in government and foster a sense of being listened to.

Innovative governments are using design thinking and customer experience labs to develop digital solutions that make each citizen touchpoint better, faster and more efficient. To create more seamless service delivery, integrated digital platforms can collate data from multiple systems within an agency (or agencies) to provide a more complete view of the citizen, based on their individual needs and circumstances.

The use of advanced analytics allows governments to leverage data continually gathered from people and devices to improve





service design and personalize delivery. For example, patients making online appointments with a health service provider could be guided to additional sources of help with their condition, such as a nearby support group or exercise class.

Technology has begun to incorporate artificial intelligence (AI) – a set of tools and programs that make software smarter by analyzing huge amounts of data to solve complex and inter-related problems. Already AI can help deliver services to citizens, using chatbots to complete transactions within government websites. It can help improve urban planning by performing adaptive scheduling and route optimization for transport operators, reducing commuters' journey times; provide educational support to students based on their individual learning needs; and enable online self-referral and screening, signposting citizens to social services based on their needs and eligibility.

Case Study: Customer experience

Unlocking the power of data to improve child protection services in New South Wales, Australia

Safeguarding children is one of the most pressing challenges facing governments. Every day, hard-hitting stories of child protection failures hit the headlines in countries all over the world. They paint a grim picture: growing numbers of children at risk of abuse and neglect; an act of physical violence by a family member or caregiver that has resulted in the death of a child; more and more children being taken into care; and child protection systems in crisis due to systemic weaknesses, stretched to the limit through an acute lack of resources.

Global statistics bear out the scale of the problem. According to UNICEF, three-quarters of children aged 2 to 4 worldwide – close to 300 million – are regularly subjected to physical punishment and/or psychological aggression by their parents or other caregivers at home. The number of children entering out of home care (OOHC) has also risen steadily in many countries. Recent research estimates that approximately 2.7 million children could be living in institutional care worldwide. Worse, once a child with complex needs enters care, it is becoming increasingly difficult for them to leave the system.

The immediate impact of violence, abuse and neglect on children's wellbeing is devastating enough. But in some cases, poor outcomes for children who have been in care continue through later life. Childhood trauma can limit educational performance and job prospects, lowering individuals' life chances,

reducing productivity in the workforce, and putting significant strain on government finances.

The problem is acute in New South Wales, Australia. In the last decade there has been a steady rise in the number of children needing protection services, including OOHC. The lack of evidence-based investment by the government and poor use of data meant that service delivery for child protection was often ineffective and reactive. Despite increased spending, long-term outcomes for children were poor and the cycle of intergenerational abuse and neglect continued.

Recent independent reviews have made a number of policy recommendations designed to create a more child-focused and personalized service system that is financially sustainable in the longer term. The state's Department of Family and Community Services (FACS) is implementing major reforms to strengthen the system. The goal: more services and better outcomes for more children at risk and in care.

The reforms aim to give children and young people the chance to have a safe, loving, permanent home for life, and help them reach their potential. This vision required a new service system design, supported by a service cost model that shifts funding from a child placement approach to one that focuses on outcomes.

The new service model and service costs are based on individual case plans for children and young people. Personalized support packages are provided based on regular assessments of the child's changing needs, support from a key worker, flexibility in service provision and funding allocations, and ongoing support.

The new approach requires changes to the way the government funds service partners, such as NGOs. New outcomes-based contracts have been developed and there will be a greater focus on helping families stay together using new intensive home-based family preservation and restoration models that target the causes of harm and treat trauma.

A single framework is being developed to define the desired outcomes, based on safety, permanency of care and a wider focus on child wellbeing. Over time, an investment approach will be adopted across all services to ensure funding and evidence are aligned most effectively to wellbeing outcomes.

To realize the broader vision, FACS needed an information system that could support decision making and improve collaboration between the network of family, carers, caseworkers and service providers. Child Story replaces 14 disparate FACS legacy systems with a single cloud-based platform. It integrates, matches and merges data to provide a holistic, single view of every child and young person under care. Given the sensitivity, strict controls and protocols have been established to govern data sharing.

Over time, data from other organizations will be migrated to the Child Story platform.

The platform puts relevant information about a child in the hands of frontline staff, helping them make the right interventions at the right time. It also provides the means for service provider organizations, family and carers to access and share information, and improve collaboration between all those involved in the support of the child.

While New South Wales is still on the journey to transform its child protection system, the early indicators suggest that its recent reforms will go a long way towards preventing harm to vulnerable children, breaking the intergenerational cycle of abuse and neglect, improving life chances for children and young people, and optimizing resources at a time of huge pressure on public spending. Children, the wider economy and society will reap the benefits of today's investment for generations to come.

Building on its work with the New South Wales Department of Family and Community Services, EY's Government and Public Sector team has developed the Citizen Intelligence Platform. The platform collates data from multiple systems within an agency, or across multiple agencies, that come into contact with children and their families. Through the application of advanced analytics, frontline staff are able to identify children at higher risk and improve the effectiveness of interventions.



Five critical areas for government digital transformation

2. Public value

In an environment of low growth and rising demand, governments must find sustainable ways to finance the delivery of public services and infrastructure. Digital technologies offer important ways to reduce costs, improve productivity and optimize public value. They create opportunities to explore new models for providing services, improve management of resources through smarter spending, and link the money invested in programs and services to the outcomes they produce for citizens, boosting accountability and trust.

Blockchain technology (distributed databases or digital ledgers of transactions that are not maintained by a single entity but shared among a distributed network of computers) can help track how money is spent through the system – for example, from finance ministry to spending department and then delivery agency. With better visibility of spending, governments can make better decisions about how to allocate public resources.

Robotic process automation (RPA) offers many benefits, including increased speed and efficiency, the flexibility to cope with peaks in demand or backlogs, and the reduction of manually introduced errors. Some governments are already using a virtual workforce to automate routine business processes, relieving the burden of high-volume, repetitive tasks in the back office, and freeing up time and resources that can be focused on frontline services.





Predictive analytics and text mining can make an important contribution to the smart management of public resources by anticipating problems and enabling preventative action – for example, identifying taxpayers at risk of nonpayment. Analytics can also inform policy design and improvement. It provides a more sophisticated understanding of people's needs and behaviors, enabling policymakers to anticipate and manage future demand for public services, easing long-term financial pressures as well as improving outcomes for citizens.

Finally, 3D printing or 'additive manufacturing' has the potential to improve turnaround time and lower construction costs for infrastructure and public transportation projects; establish more efficient and lower-cost supply chains for defense agencies; and facilitate job creation and economic transformation of remote locations through the introduction of new manufacturing capabilities.

As well as deploying these technologies to boost public value, governments must think differently about their role, becoming a platform for an ecosystem of partners including agencies, private businesses, not-for-profit organizations and social enterprises that together can develop innovative services and business models. Governments should maximize the value of open data by sharing information across departments and agencies, and running crowdsourcing initiatives and co-creation programs with citizens. They can also explore experimental funding approaches such as innovation labs, incubators and partnerships with start-ups.

Digital marketplaces will help governments procure from a diverse range of suppliers, negotiate better contract terms and improve value for money. E-procurement platforms can help to track items, increase transparency and develop new, agile methods of collaboration.

Case Study: Public value

Using intelligent automation to help a UK local council deliver more efficient services and better outcomes for its communities.

EY helped the City of Edinburgh Council to introduce intelligent automation (IA) as a way to sustain essential services in a challenging environment.

These challenges include:

- ▶ Reducing funding
- ▶ Rising demand for services
- ▶ Aging population
- ▶ Significant population growth
- ▶ Impact of welfare reform
- ▶ Increasing expectations from service users

“The challenge is that citizens’ needs are getting more complex while at the same time everyone expects councils to do more with less,” says Shelia Haig, the council’s Revenues and Benefits Manager.

Having already delivered significant financial savings, operational benefits and social value through a range of transformation initiatives, the organization needed to find new ways to boost its efficiency and effectiveness still further. EY proposed that an integrated and innovative approach to IA could provide a range of benefits, including increased

availability of services for citizens; enhanced front-line service delivery; resources freed up to support council priorities; and improved employee engagement and job satisfaction.

It would also help the council in its aim to deliver services that reflected Edinburgh’s world-leading digital status. It was important to draw upon local talent and insight to lead the deployment of IA across public services in Scotland.

The Intelligent Automation Program was provided through an integrated approach – drawing upon emerging automation technologies, redesigning processes around the customer and supporting everyone involved through a structured change management process.

Working in collaboration with the council, EY led the launch and roll-out of the new technology, starting within customer services, including its transactional hub and Revenues and Benefits team. The ambition is eventually to apply IA across all frontline services and support functions.

Automations that have been developed so far include:

- ▶ Freeing up social workers’ time by automating the carer payment process
- ▶ Increasing the accuracy and speed of the landlord registration process

- ▶ Improving the social housing repairs process from request through to completion
- ▶ Accelerating the customer contact process by routing contacts and prioritizing enquiries
- ▶ Introducing automated audit and reporting relating to all purchase card transactions
- ▶ Freeing up the time of senior practitioners within the Edinburgh Health and Social Care Partnership to allow additional consultations
- ▶ Enhancing the scheduling of social workers to support vulnerable children, improving reporting while meeting statutory deadlines.

Core to the work is sustaining the change. The EY team has helped the council to establish a Center of Expertise and are building capacity through training, coaching and mentoring; providing technical experience; and sharing tools and techniques to support the change management process.

Through the initial deployment of IA, the council has realized significant benefits.

Customer service has improved, and there is greater availability of services – 24/7 in some cases. Meanwhile,

enhanced management information is helping to support decision-making.

Administrative, logic-based tasks are being provided with high accuracy and reduced effort. In turn, employees are freed up to spend less time carrying out routine administrative tasks, and more time using their specialist skills to support complex cases. Employee engagement and job satisfaction are higher as a result.

“If you can relieve pressure in the administrative aspects it helps,” says Kirsty Louise Campbell, the council’s Head of Strategy and Insight. “The fundamental question is: do you want a social worker spending 80% of their time filling in forms or helping someone? After all, a desire to help people is why they went into the profession in the first place.”



Five critical areas for government digital transformation

3. Citizen security

We live in uncertain times. The threats from unpredictable states, terrorist groups and other non-state actors are increasing and made more complex through digital technology. Today, conflicts are waged not only on the battlefield but also on public transport, on social media and in cyberspace.

Governments have a responsibility to safeguard their citizens from a whole range of threats including cyber attacks, organized crime, homicide, espionage and terrorism, enabling them to live and work without fear. Digitalization is both a hindrance and a help in this struggle.

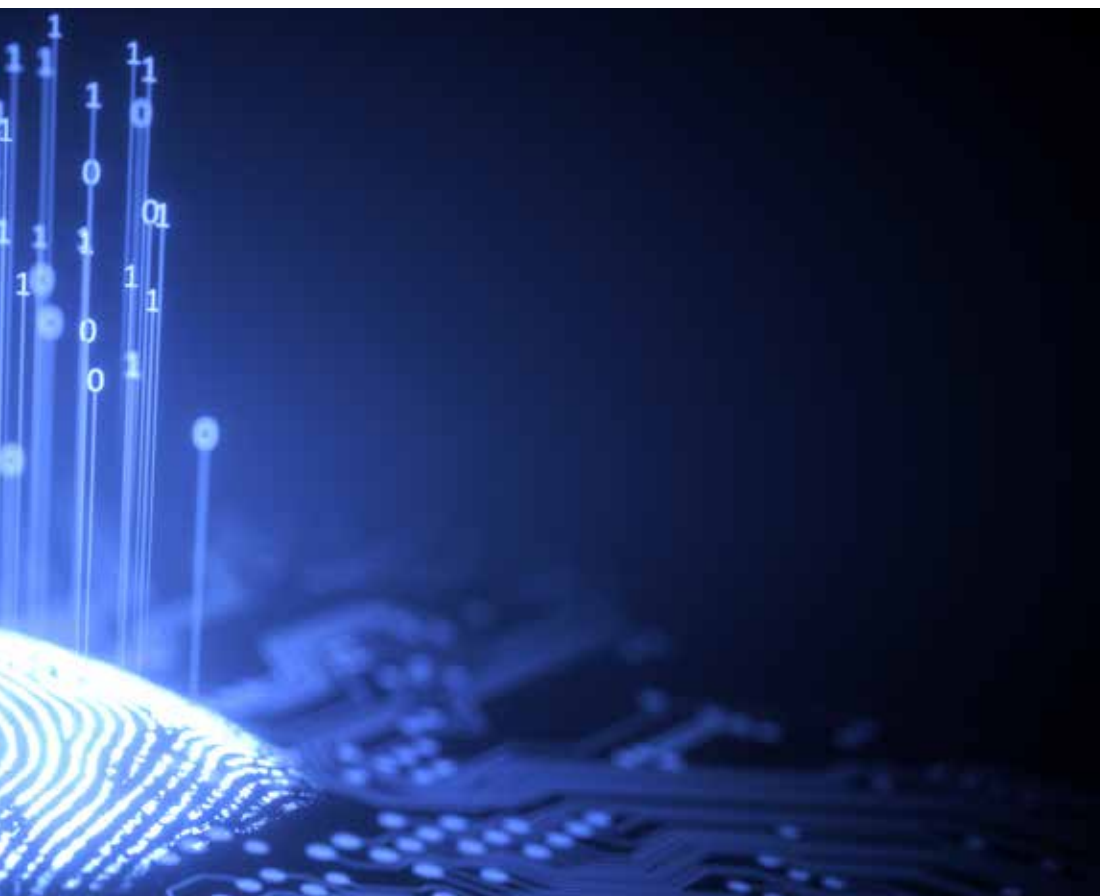
On the one hand, as governments embrace digital technologies and become more and more interconnected with partner organizations and smart devices, new vulnerabilities arise that can be exploited by cyber attackers. Terrorists, fraudsters and hackers can jeopardize the delivery of essential public services and the smooth running of civil society, including the election process. No wonder WEF rates a large-scale breach of cybersecurity as one of the five most serious risks currently facing the world.⁴

On the other hand, digital technologies provide a sophisticated means of combating threats. Defense organizations are investing in AI and machine learning; cyber weapons and threat detection programs; cybersecurity apparatus; robotics and digital tools to make them nimbler and more effective. Police forces are using mobile technologies to reduce incident response times, while data analytics is enabling predictive policing models and better threat analysis planning. Surveillance technology and facial and image recognition software is helping to identify offenders and improve conviction rates.

Citizens are becoming increasingly concerned about the way their data is being used. Recent data breaches have also undermined trust. Governments are considering how to combat the threat to people's privacy and the inappropriate use of their data. Some regulation has started to appear. The EU has taken the lead with its new General Data Protection Regulation (GDPR). This gives citizens significantly more rights and powers over how their data is used and consumed, with large fines imposed for any breaches of the regulation.



⁴Global Risks Report 2017, World Economic Forum, January 2017



Meanwhile governments are introducing information security management systems that meet the cybersecurity challenge, safeguarding the data they keep and increasingly rely on. It is not possible to repel every threat, but resilient organizations know how to protect themselves, how to detect a problem when it occurs, and how to react quickly and effectively in the event of a breach. There is now a good understanding of the most common attack methods and the ingredients of cybersecurity hygiene with which most such attacks can be defeated. Active defense strategies and advanced threat intelligence provide a basis for withstanding more sophisticated attack methods, and while new methods are emerging all the time, good cybersecurity governance and concepts such as security-by-design give organizations a fighting chance.

As well as developing a rigorous cybersecurity approach, governments must also exploit the power of cloud computing to increase their own computing capacity, support secure biometric identification programs and provide safe payment platforms for citizen transactions.

Case Study: Citizen security

Managing cybersecurity risks as Norway invests in new-generation technology for rail infrastructure

EY has worked with Norway's rail infrastructure provider Bane NOR to help establish a robust cybersecurity framework so that the organization could anticipate and manage 21st-century risks.

Bane NOR operates, maintains and develops the country's rail infrastructure. It is responsible for traffic management on the national rail network, including capacity allocation and route planning, together with operational traffic management and public information at stations. The organization is in the process of replacing its 1950s-era technology with a next-generation traffic control system, and has also introduced an extensive suite of other digitalization initiatives aimed at reducing maintenance costs, making services more reliable, and providing better and faster information for travelers and train operators. However, it still lacked a coherent framework for managing cybersecurity risk.

Therefore, Bane NOR was under heavy government scrutiny regarding its compliance with cybersecurity regulations, and was having to report monthly on how it was tackling the issue. The problem was also attracting negative media attention.

EY already had a longstanding relationship with Bane NOR, which asked us to provide a transformation program for the entire organization. "Bane NOR had a critical need to ensure it was able to deal systematically with the risks associated

with a changing internal digital landscape and continuously evolving external threats, as well as governmental requirements," explains EY Associate Partner Tone Thingbø. "The maturity of Bane NOR's internal control and cybersecurity was very low and it needed to demonstrate substantial improvement by the end of the two-year transformation program."

The main focus was to help ensure Bane NOR could show its owner, regulator and key external stakeholders that it was complying with laws and regulations. But it also needed to understand the operational risks associated with cybersecurity and feel confident in its ability to handle the threat landscape and its own known vulnerabilities. To achieve all this it needed not only EY cybersecurity capabilities, but also experience in change management and communication.

The EY team helped Bane NOR develop and implement a business-driven risk management process for cybersecurity, aimed at helping the entire organization deal with cyber risk in a structured and controllable manner. Introducing new technology such as IP (Internet Protocol)-based traffic management, new IoT systems and analytics not only solves problems – it introduces fresh challenges and risks that the organization must take into account. So it was also key to make cyber-risk analysis an ongoing part of risk management, so that the correct measures can be put in place to help mitigate against emerging threats.

If such a framework is to be effective, there needs to be good communication and a shared security culture across the organization. The EY team helped provide the necessary training so that all of Bane NOR's 4,000 employees and numerous sub-contractors understood the nature of the threat, their own personal responsibility for contributing to robust cybersecurity, how to react if an incident occurred, and the processes for continuous improvement.

Over the course of the two-year project, the EY role included:

- ▶ Developing the necessary principles, policies and guidelines for the cybersecurity management system.
- ▶ Introducing a robust process for security incident handling by piloting roles, tasks and procedures.
- ▶ Instituting methodologies for risk assessment, based on international standards and frameworks.
- ▶ Completing a large number of 'crown jewel' asset evaluations, threat assessments and vulnerability assessments within information security.
- ▶ Providing training courses for key personnel within Bane NOR, and coaching them to take on full responsibility by the end of the project.
- ▶ Setting up an information security forum for information

security coordinators, so that experience and expertise could be shared across the entire organization.

- Providing awareness-raising activities across the enterprise.
- Developing a two-year roadmap for technological improvements based on the risk assessments performed.

Bane NOR is now able to manage the risks of its systems and networks in order to deter, detect and respond to cyber threats and implement recovery procedures if a cyber incident does occur, getting systems up and running again as swiftly as possible. The completion of the program has also led to a further project to improve the IT department's management of identities and accesses, again with our support.

The government is satisfied with Bane NOR's cybersecurity management, which now meets the required standards. The cybersecurity improvements have led to more transparency regarding risks, making the network more secure, passengers safer, and data protected. Bane NOR is in a much better position to respond to future threat developments as it continues to improve its technologies and develop the capacity to handle large-scale cyber attacks.

The reputation of the organization has increased, boosting its ability to attract talent with the right skills to maintain a high standard of security risk management. It is also collaborating with Swedish and Danish rail infrastructure providers to identify synergies in handling cybersecurity risks.



Five critical areas for government digital transformation

4. Future workforce

Economic growth, social cohesion and equality of opportunity rely on a country's workforce being skilled and ready to embrace the needs of 21st-century employers.

Governments need to build the skills and capabilities of their own employees in order to drive greater efficiencies, elevate customer focus and strengthen diversity and inclusion. In a competitive labor market, the public sector has not always been an employer of choice for top talent. Governments need to do more to attract, retain and develop people with the required skills and capabilities across a wide range of areas. They must take steps to build core technical skills such as software development and systems architecture, as well as the new skills that support transformation, such as data science, digital marketing, and user-experience research. As they gradually build a more dynamic and responsive environment, governments will attract younger workers and millennials who are in search of purpose-led roles where they can make a difference to society. Through focused and strategic talent development, governments can also empower employees to be agile, life-long skill developers able to learn and apply new technological advances, thereby "future proofing" government.

Creating this new culture partly relies on governments freeing up employees' time to concentrate on more stimulating and value-adding tasks. This can be done by deploying intelligent automation tools to complement and augment human workers.





Reducing the amount of manual and repetitive work leads to higher levels of productivity and satisfaction, in turn helping to attract and retain high-quality candidates and improve citizens' experience with government services.

Mobile technologies can help agencies empower their workforce to do their jobs more effectively. As a high proportion of public sector employees regularly work outside the office, they can be equipped with devices such as smartphones, tablets, and laptops to perform their duties wherever they're located. From census workers and emergency responders to health professionals, social workers and military personnel on front-line missions, employees can access applications in real time, share information seamlessly, and improve productivity, response times, decision-making, and reporting from the field.

While governments need to prepare their own workforces for the digital age, technological changes such as automation and AI have far-reaching implications for the future of work, economies

and society in general. Governments must adopt, update and strengthen policies to mitigate any adverse social and economic consequences – such as the displacement of workers in some lower-skilled jobs, and widening social inequality – that could hamper future growth and development. These adverse effects can be offset by policies that ease the transition, including retraining opportunities to equip the workforce with the digital skills and competencies required for the automation age.

Governments must ensure they have an education system that prepares young people to succeed in a competitive world where boundaries between industries are dissolving and technology is rewriting how, where and when people work. And with people living and working for longer, governments also have a responsibility to ensure lifelong learning opportunities are available to all.

Case Study: Future workforce

Giving police officers in the UK city of Manchester smartphones and wearable tech to boost effectiveness, save money and better serve citizens.

EY worked with Greater Manchester Police to equip its officers with smartphones, tablets, mobile apps and wearable tech so they can carry out key procedures such as taking witness statements without having to return to base.

Digital transformation is the most effective way for police forces to respond to the challenging landscape in which they have to operate, which includes new types of criminal threat, rising public expectations, tightening budgets and intensifying government scrutiny.

Greater Manchester Police (GMP) is one of the largest police forces in the UK, serving 2.5m citizens and employing 6,500 police officers and 2,700 support staff. The EY relationship with the force began in 2010 as it prepared to embark on a digital transformation program aimed at realizing the £67m in cost savings required by UK central government while at the same time making its organization more agile, its police officers more effective and its communities safer.

Most police forces now recognize that they must transform their traditional operating model and exploit the full potential of digital technology in order to predict and prevent crime, free their officers from the stranglehold of paperwork and share information with other agencies. Only then will they be equipped to deal with emerging forms of criminality such as cyber-crime, hate crime and terrorism – something no city understands

better than Manchester, which suffered a devastating terrorist bomb attack in 2017.

The EY team wanted to help GMP do more than simply replace its ageing operational systems; it wanted to help enable a fundamental shift in how it delivers its services. “EY shares GMP’s vision for the future model of policing,” says Richard Williamson, EY Strategic Delivery Partner Lead. “We understand that the nature of crime is changing, requiring forces to transform their ways of working. GMP required a partner who would not just ‘do the day job’ but bring innovative suggestions, add social value and leave the force with a legacy of skills that can be used in the future.”

To reduce crime and repeat offending, police officers need to understand their communities so that, together with partners, they can tackle the root causes of problems. As a key plank of GMP’s digital transformation, the EY team designed and procured new mobile capabilities to allow officers to spend more time in valuable, public-facing activities and less time processing paperwork back at base.

Over the course of a nine-month phased deployment, 6,500 officers and other staff were equipped with more than 9,000 devices including smartphones, tablets and wearable tech. For the first time, they could use a mobile app to complete key policing procedures on the spot, such as taking

witness statements, logging evidence and consulting the main database.

This major shift in policing methods was underpinned by a new operating model and an integrated operational policing system that gives users access to better-quality information, supports a shift towards greater citizen interaction and improves information sharing with partners such as fire fighters and paramedics. The team helped identify the benefits of new IT solutions, provided procurement knowledge and managed the design and deployment of a new data warehouse, a new command and control system, crime and intelligence records management, evidential property management and case file management.

GMP moved from disparate siloed systems that did not speak to each other, to a platform with a common language, paving the way for deeper collaboration and partnership working across the region. The organization now has a flexible and scalable solution that will accommodate its changing needs in a cost-effective way.

Thanks to this ambitious digital transformation, GMP has become a pioneering connected police force in the UK. The digital enablement of the entire force has liberated thousands of officers to take responsibility, make decisions

and solve problems 'on the go', allowing them to form deeper relationships with the communities they serve.

Officers can stay out for longer periods and provide a more reassuring presence on the streets. There is better collaboration with other emergency services, community groups and citizens. GMP is also committed to sharing its knowledge and expertise with other police forces.

"The project to provide all of my officers with mobile technology has been a resounding success," says Greater Manchester Police Chief Constable Ian Hopkins. "Giving officers the modern tools they need to help them solve incidents and problems without needing to return to the police station has improved our performance and efficiency dramatically."

Since the digital transformation:

- ▶ Mobile has released an estimated 450 officer hours per day, largely due to time saved traveling
- ▶ 92% of routine policing transactions have been conducted outside of the station
- ▶ More than 34,000 electronic witness statements have been submitted which otherwise would have been written by hand
- ▶ Time and resources saved equate to 66 additional officers in the field per year



Five critical areas for government digital transformation

5. Smart infrastructure

Infrastructure investment and development is one of the top priorities for governments globally, imperative for poverty reduction, social progress and inclusive economic growth. Many of today's most fundamental challenges – urbanization, globalization, pollution, water shortages and climate change – can be tackled with smart infrastructure developments such as connected cars, electric vehicles, smart power grids, energy-efficient buildings, Internet of Things (IoT) networks and open data portals.

Governments are facing a strong impetus globally to build and upgrade infrastructure, particularly in urban centers where expanding populations are putting increasing pressure on aging facilities. Many emerging countries need new infrastructure to support their growing populations and increased economic activity, while mature markets must renew deteriorating or inefficient infrastructure in a bid to revive slow growth rates. However, there have been years of underinvestment in infrastructure, a shortfall that is now catching up with countries around the world. Estimates show that nearly US\$100 trillion globally needs to be spent on infrastructure in the next 20 years.

Smart infrastructure offers a way to harness the latest technologies to obtain maximum value and efficiency and create resilience and sustainability. It applies digital technology – such as smart devices, sensors and software – to physical structures, from power plants to bridges. These intelligent devices enable more efficient and effective monitoring and control of energy and water systems, transportation networks, human services, and public safety operations – all core government functions.

IoT can unlock opportunities to improve value in multiple areas. In cities, transport companies can deploy intelligent traffic management systems that use global positioning systems (GPS), sensor information from monitoring cameras, and other sources to monitor population movement and ease traffic congestion. Other examples of IoT adoption include smart waste and water management techniques, which save water and improve efficiency in waste collection, and the proactive monitoring and maintenance of public infrastructure. Meanwhile smart metering and grid management are used to forecast demand, track usage patterns and prevent power outages.

Governments must also pursue policies to create the enabling environment for a thriving digital economy. To do so, they need to work with private businesses to provide enhanced 4G and forthcoming 5G networks, and data centers; create high digital literacy among citizens; promote digital inclusion; and enable secure access to services, through digital identification systems.

The public sector cannot fund every infrastructure project itself; it must find innovative ways of working with other investors. As traditional funding sources dwindle, local governments too must embrace some of the new financing strategies available today. This also raises the importance of city planning and government oversight.



Case Study: Smart infrastructure

How the Indian city of Nagpur is deploying technology solutions to drive inclusive growth and improve quality of life for its 2.5m residents

Nagpur is rapidly expanding, with a fast-growing economy and robust health and education infrastructure. It is also strategically important to India's economy, thanks to its location at the center of the country. However, the city has been struggling with a number of issues in recent years, with unplanned urbanization resulting in slums, pollution, poor waste management and inadequate public transport. Before the start of the smart city transformation, 46% of citizens felt they had no access to recreation and entertainment, 40% felt they lacked employment opportunities and 42% of women did not feel safe.

Drawing inspiration from the Indian government's Smart City Mission, the state of Maharashtra developed a charter for transforming major urban centers using technology. The first city selected for this IT-led transformation was Nagpur. Nagpur Municipal Corporation (NMC), the body responsible for the administration and development of the city, wanted to harness the power of technology – including digital networks, smart sensors, advanced analytics and IT solutions – to build a better living and working environment for all its citizens. Nagpur Police Department and other city bodies and stakeholders would collaborate closely on the project, while real-time data management, alerts, forecasting and information processing would enable city planners to build strategies for sustainable future development.

Delivering such an ambitious program – the first of its kind in the country – was always going to be challenging, and the government of Maharashtra asked us to help with design and implementation. “The Nagpur Safe and Smart City project is unique not only in terms of the range of IT solutions it covers but also in the extensive coverage and the tight timelines,” explains Vikas Aggarwal, EY Engagement Partner.

The EY team carried out extensive groundwork at the start of the project, including assessing current initiatives and implementation mechanisms, identifying gaps, and preparing a smart city vision and integration plan, both of which involved extensive stakeholder consultation. Citizens' input and ideas were vital, and were used to help prioritize the delivery of smart services, to tackle key areas of concern such as safety, cleanliness and access to the internet.

The next milestone was the detailed design and architecture of IT initiatives, which included a City Operations Center for civic operations and emergency response, and a City Command and Control Center for law enforcement agencies. The EY team also provided design knowledge for a citywide captive network backbone comprising a free wifi network for individuals and businesses; citizen service kiosks (with provision for emergency response), and smart surveillance, including advanced video analytics. But perhaps the most visible and distinguishing

feature of the project was the launch of a 'smart strip': a 6km stretch of road showcasing advanced services such as smart transport, smart parking, solid waste management, environment sensors and smart lighting.

The EY team is now helping the city administration to develop specific business models for the monetization of these newly created assets, largely through public-private partnerships, as well as assisting with plans to roll out further smart solutions throughout the city.

The program has been highly successful, winning funding from the government of Maharashtra, and resulting in Nagpur taking a leading position on the chart for Smart Cities Implementation in India.

Most importantly, the benefits for citizens are already starting to flow:

- ▶ The city now has its own assets and captive communications capacity, to be used in future development schemes.
- ▶ Public services are accessible to all residents 24/7.
- ▶ All sections of society can participate in the process of urban development and reform.
- ▶ Citizens feel safe and secure, improving quality of life and contributing to economic development.

- ▶ Emergency services can be accessed seamlessly throughout the city.
- ▶ A cashless economy is being promoted, paving the way for various financial inclusion initiatives from the Indian government.
- ▶ Traffic management has improved, leading to cleaner air and better mobility.

“By the time the pan-city implementation of the smart solutions goes live, we expect to see further benefits, for example, the city becoming more energy efficient, businesses growing thanks to better infrastructure, and revenues being generated, which can be ploughed into future development,” says Aggarwal.

Vijay Kumar Gautam, Principal Secretary – Information Technology, Government of Maharashtra, is pleased with the city’s progress. “The EY team has shown not only a very high caliber of competency levels but also communications skills, to connect with all kind of stakeholders,” he says. “With their support, I think we will be able to establish a state-of-the-art model for a smart and safe city to be followed by other cities in the country.”





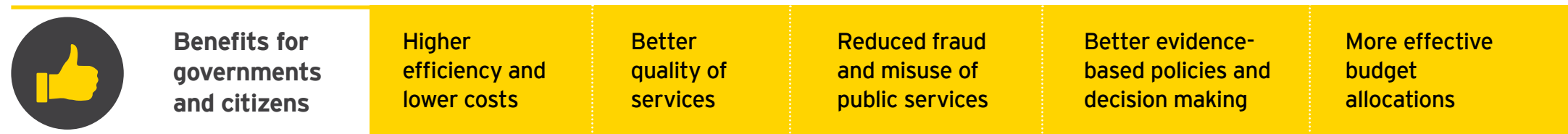
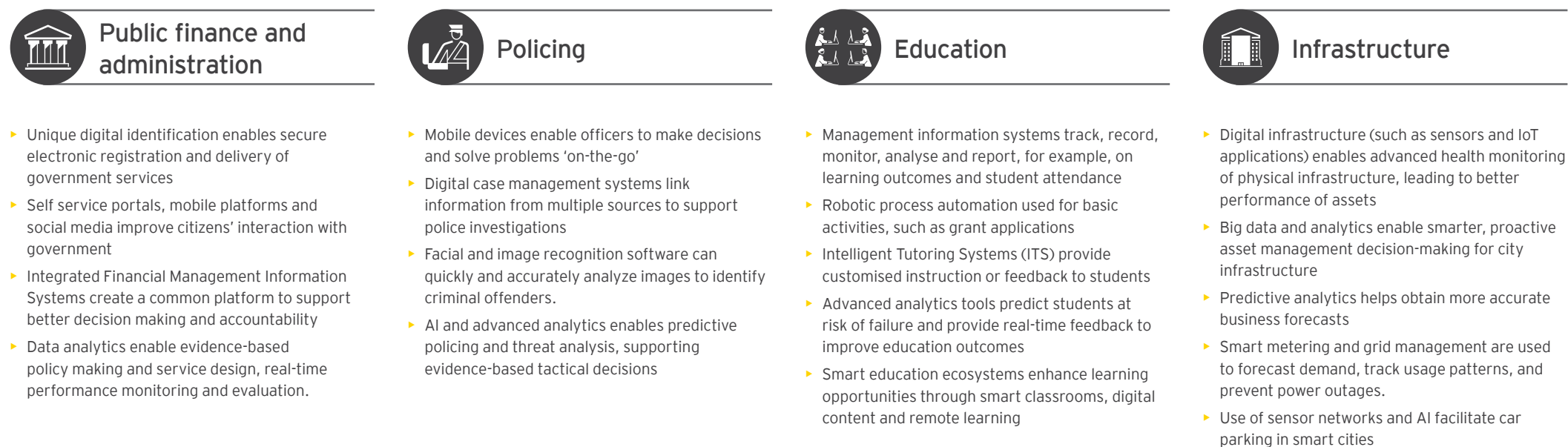
What benefits will digitally enabled government bring to individual citizens and wider society?

Those governments that transform successfully will reap many benefits. Integrated technology platforms will enable joined-up service delivery across agency silos to more effectively meet individuals' complex needs. Enhanced data analytic capabilities will support smarter decision-making and more targeted and personalized service delivery, providing a better overall customer experience. Predictive analytics will provide governments with the insight to focus on prevention and targeted interventions in areas such as health and social services, helping manage demand upstream and reduce long-term funding commitments.



Figure 1. The benefits of digital transformation in the public sector

Digitization of government and public services





Transportation

- ▶ Intelligent Transport Systems integrate public transit systems, offer single multimodal interface, and facilitate data gathering and intelligence.
- ▶ Predictive maintenance (e.g., sensors in trains) helps to avoid service disruptions
- ▶ Self-service technology (e.g., facial recognition) improves the customer journey at airports
- ▶ Sensors and data analytics improve traffic management by tracking peak hours and hot spots
- ▶ Real-time sensing technology and machine learning enables the development of self-driving cars



Healthcare

- ▶ Telemedicine enables remote diagnosis, monitoring and treatment of patients
- ▶ AI enables key word tracking on social media to enable public health agencies to identify and respond to disease outbreaks
- ▶ Hospital systems streamline patient monitoring and use smart algorithms to improve care and outcomes
- ▶ Advanced analytics is used to mine health outcome data to enable more personalized diagnosis and treatment



Tax and customs

- ▶ Integrated digital services, including e-filing and e-invoicing, encourage seamless service delivery and improved compliance
- ▶ Smart portals and mobile apps allow taxpayers to self-manage their tax affairs
- ▶ Advanced analytics enables a shift from 'total audit' to risk management-based approach to compliance
- ▶ AI chatbots interact with taxpayers to help streamline tax processes
- ▶ Blockchain offers a means to combat fraud, trace and match data and automate reporting



Defense

- ▶ Wearable devices, smartphones and other smart technologies enable soldiers to relay information from the field
- ▶ Smart military bases employ technologies to improve the quality and speed of their functions and services
- ▶ Intelligent automation helps drive efficiency in back office processes such as inventory management, finance and HR
- ▶ Unmanned drones are used on the battlefield, for instance, to improve surveillance or disarm explosive devices



Social services

- ▶ Integrated digital platforms collate data from multiple systems within an agency (or agencies) to create a single view of the citizen
- ▶ Predictive risk models support early intervention and more effective targeting of services for vulnerable individuals and families
- ▶ AI platforms enable online self-referral and screening, signposting citizens to services based on their needs and eligibility
- ▶ Digital reporting systems are used to document care plans, risk assessments, health assessments, etc. on the system in real time

More personalized services and targeted interventions


Increased transparency and accountability

Higher customer satisfaction

Greater public participation and trust

Ease of doing business and stimulus for innovation

Enhanced international reputation



Governments that effectively manage digital transformation will create a world-class quality of life for their citizens, regain public trust and improve their country's competitiveness within the global economy. They will also be in much better shape to weather the next surge of disruption, whatever form that may take.

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EYG No. 012642-18Gbl

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