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Embracing Innovation in Government

Global Trends

February 2017

استشراف حكومات المستقبل
SHAPING FUTURE GOVERNMENTS

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BETTER POLICIES FOR BETTER LIVES

The Observatory of Public Sector Innovation collects and analyses examples and shared experiences of public sector innovation to provide practical advice to countries on how to make innovation work.

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Highlights

What are the latest developments in government innovation?

Innovation in government is about finding new ways to impact the lives of citizens, and new approaches to activating them as partners to shape the future together. It involves overcoming old structures and modes of thinking and embracing new technologies and ideas. The potential of innovation in government is immense; however, the challenges governments face are significant. Despite this, governments are transforming the way they work to ensure this potential is met.

A GLOBAL REVIEW OF GOVERNMENT INNOVATION

Since 2014, the OECD Observatory of Public Sector Innovation (OPSI), an OECD Directorate for Public Governance and Territorial Development (GOV) initiative, has been working to identify the key issues for innovation in government and what can be done to achieve greater impact. To learn from governments on the leading edge of this field, OPSI has partnered with the Government of the United Arab Emirates (UAE) and its Mohammed Bin Rashid Centre for Government Innovation (MBRCGI) , as part of the Middle East and North Africa (MENA)-OECD Governance Programme, to conduct a global review of new ways in which governments are transforming their operations and improving the lives of their people, culminating in this report. Through research and an open Call for Innovations, the review surfaces key trends, challenges, and success factors in innovation today, as well as examples and case studies to illustrate them and recommendations to help support innovation. This report is published in conjunction with the 2017 World Government Summit, which brings together over 100 countries to discuss innovative ways to solve the challenges facing humanity.

CROSS-CUTTING FACTORS THAT IMPACT INNOVATION

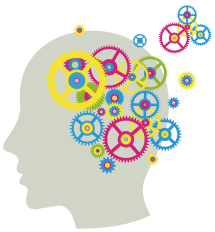
The review has identified four cross-cutting factors for unlocking innovation:

- Overcoming bureaucratic barriers
- Harnessing the power of citizens' ideas and the people behind them
- Building open, transparent and trust-based relationships with citizens
- Enabling a culture that supports innovation

RECOMMENDATIONS FOR GOVERNMENTS

Continuously striving for improvement is at the heart of innovation, and the review has identified four cross-cutting things governments can do to maximise the potential for innovation:

- Signal innovation as a priority
- Enable connections across and beyond government
- Promote trust through transparency and responsiveness
- Forge partnerships with all relevant players



Human and machine: pairing human knowledge with innovative tools

Governments around the world are making increased use of innovative tools to anticipate and understand the complexity and uncertainty of societies and nature.
From big data analytics to smart cities, drones to social networks, and predictive algorithms to machine learning, technology is enabling governments to better monitor both the physical environment and the daily concerns of citizens. These tools can support government decision-making and be used in new ways to interact with citizens, in particular by automatically detecting anomalies and forecasting potential crises that require government action.

These tools are not autonomous, however. Adept individuals are needed to use them and interpret their results.

Several themes have been observed in this area:

- Governments are implementing innovative early warning systems in response to increasingly complex and severe challenges
- The exponential growth of data unlocks innovation in monitoring and prediction systems
- Progress in data analytics helps governments understand complexity and take action

KEY RECOMMENDATIONS

- **Manage data as an asset for many uses and users**
- **Open data to fuel innovation**
- **Develop open checks and balances**
- **Integrate resilience in system design**

CASE STUDY: **PetaBencana.id**
Greater Jakarta is the world's second largest megacity and experiences regular flooding. To help cope, innovators created PetaBencana.id, a tool that combines data from hydraulic sensors with citizen reports over social media and civic applications, including via Twitter, to produce real-time flood maps in Jakarta. These web-based, publicly accessible maps now provide the best available flood information for the government and residents.

CASE STUDY: **Extreme Weather App**
The UAE has launched a freely accessible application that alerts citizens and government about current and future weather emergencies. It is one of the first to specialize in detecting and predicting sandstorms, which pose a major challenge in the Middle East.

Image sources are included in the main body of the report.

Zoom in or zoom out: scaling government

One of the trickiest aspects of government involves scale. In terms of innovation, this means establishing how to scale an innovation initiative from small to large once it has demonstrated its value.

This approach has long been regarded as the optimal approach to innovation, as it provides opportunities to adjust and adapt based on user reactions and lessons learned, and allows potential failures to happen quickly before significant resources are invested.

Increasingly, however, scale has come to take on a second meaning, as technological advances allow governments to re-evaluate what scale implies. On the macro side, it involves the use of data and information from an ever-expanding number of sources, while on the micro side it can imply seeking answers to government problems with sources or tools so small they cannot be seen with the human eye.

A number of themes have been observed in this area:

- Going from micro to macro: labs, transformation teams and incubators
- Reimagining micro and macro: new conceptions of scale ranging from nanotechnology to leveraging mass numbers of people for innovation

KEY RECOMMENDATIONS

- **Provide a common ground for collaboration**
- **Build shared approaches to encourage innovation**
- **Be a willing and responsive partner**
- **Build trust through transparency**

CASE STUDY: **Mapatón**
Mexico City has one of the largest public bus systems in the world. Because of its size and complexity, the city had not been able to develop data or maps for buses, which provide 14 million individual rides per day. To address this problem, the city launched Mapatón, an innovative crowdsourcing and gamification experiment to map the city's bus routes. Over 4 000 riders played the game, which relayed critical information such as GPS coordinates to the city. In a matter of weeks, the players provided sufficient data to map the routes.

Citizens as experts: redefining citizen-government boundaries

Governments are redefining the boundaries between themselves and their citizens in important ways. Innovations that expand and redefine the relationship between the government and citizens help to provide more inclusive, transparent and accountable governments, which can further amplify the power of innovation.

Innovative governments are enhancing citizen engagement and ensuring public involvement at every stage of the policy cycle: from shaping ideas to designing, delivering and monitoring services. The goal is not only to improve the type and quality of services that governments provide, but also to transform the culture of government so that citizens are seen as partners who can shape and inform policy and services.

Several themes have been observed in this area:

- Governments are pursuing multiple approaches to involving citizens in promoting innovation
- Governments are renegotiating what it means to be an expert through active participation and co-creation of policies and services by their citizens
- Governments are linking citizen engagement to other key initiatives

KEY RECOMMENDATIONS

- **Develop government-wide engagement strategies**
- **Arm public employees and citizens with tools to connect and establish dialogue**
- **Build evaluation into the innovation process**
- **Take feedback into account and reconnect with citizens**

CASE STUDY: **Agents of Open Government**
The City of São Paulo has developed Agents of Open Government, a platform for peer-to-peer learning, where private citizens with useful skills are given support to develop courses for government employees, civil society groups and communities in all corners of São Paulo.

CASE STUDY: **Place to Experiment**
Finland has launched the Place to Experiment digital platform for piloting and experimenting with public innovations. This platform is designed to promote useful initiatives and new practices by supporting small trials initiated by citizens, as well as by funding large-scale experiments backed by the government.

Mass or personalised services: the next generation of service delivery

The world is changing at a remarkable ppace and each new advance is accompanied by expectations on the part of its citizens. Governments at the forefront of innovation are re-inventing their operations to better meet these expectations by providing services more attuned to the lives of their citizens, residents and other stakeholders, based on a deep understanding of their needs.

Innovative governments have realised that a citizen should not have to know the internal workings of complex bureaucracies to obtain the services they require. They have begun to change the way in which they do business by providing more holistic solutions that optimise services, according to the needs of citizens, and continuously improve services in response to feedback.

Several themes have been observed in this area:

- Governments are embracing user-centred design principles from the tech industry to innovate services
- Digital government efforts and the growth of data are leading to holistic and personalised services
- Governments are using transparency to build trust in these service innovations
- Governments are using systems thinking approaches to transform government at a systems level

KEY RECOMMENDATIONS

- **Clarify rules and regulations**
- **Promote interaction among civil servants**
- **Catalogue data comprehensively**
- **Be transparent about data collection and use**
- **Engage partners with shared values**

CASE STUDY: **The Wellbeing Project**
The city of Santa Monica, California is tapping the power of data to understand what makes an individual, community or a whole society flourish. They are using the results to target government policies and programmes to help residents of all ages and backgrounds thrive.

CASE STUDY: **Virtual Warsaw**
To ensure accessibility and inclusiveness for the visually impaired, the City of Warsaw launched "Virtual Warsaw", a virtual smart city that gives eyes to those who have trouble seeing. The city is deploying a network of hundreds of thousands of beacon sensors equipped with next-generation Bluetooth to help visually impaired residents move independently about the city with assistance from their smartphones.

Experimental government: small bets with big potential

To gather knowledge and evidence on what works or what could work better in a cost-efficient way, public authorities need to experiment and learn iteratively. The process of innovating means dealing with uncertainty; it means accepting that sometimes experiments do not work as expected, and that many innovation efforts will fail. There is no such thing as risk-free innovation.

This should not discourage governments from trying out new opportunities, but it does mean that they should do it consciously, assessing the risks and developing strategies to manage them. Experimentation embodies that ideal. By testing and validating new ideas and solutions at a manageable scale before diffusing and scaling-up successful experiments, governments can persevere in exploring new solutions while minimising their costs.

Several themes have been observed in this area:

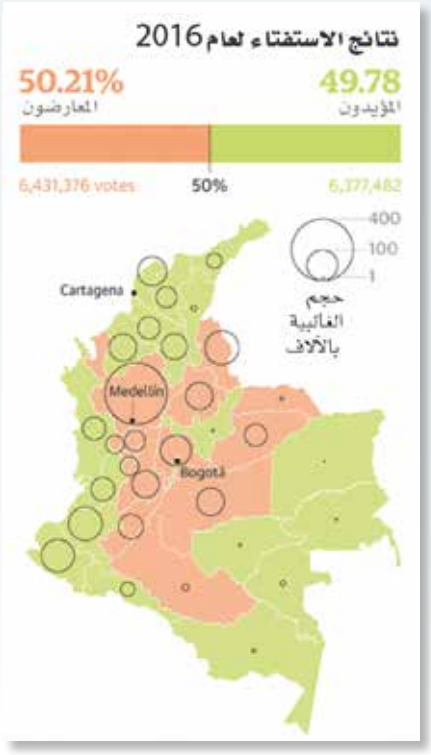
- Governments are engaging in behavioural insights experiments to inform new approaches to services
- Some countries are building policies to foster national-level experiments
- Governments are using experimentation as a way to test emerging technologies

KEY RECOMMENDATIONS

- **Provide empowerment and space for innovation and experimentation**
- **Ensure the system is flexible**
- **Build the institutional infrastructure to scale-up successes**
- **Consider ethics protocols for experimentation**

CASE STUDY: **Blockchain Voting**

In order to give Colombian expatriates a voice in a 2016 Peace plebiscite and test the potential of blockchain technology in electoral processes, the tech non-profit Democracy Earth Foundation set up a digital process that allowed the expatriates, who were unable to vote through the official process, an opportunity to vote on whether to approve a historic peace treaty. This process raised interesting questions for governments about the future use of blockchain in electoral processes.



Breaking the norms: rethinking the machinery of government

People are at the core of innovation. Ideas for new services and are sparked in the minds of civil servants, political leaders, service users and members of the broader community, and are developed and scaled through the dedication of many professionals and stakeholders at different stages of the process. Civil servants are central at every stage, and therefore the management of government employees comes into focus, both as an enabler of innovation, as well as a component to be innovated.

If the workforce functions as the brains of government innovation, funding and financing mechanisms provide the blood. Even simple innovations need access to some level of funding and financial support to make their way from idea to reality. The availability and nature of this financing can contribute greatly to the eventual success of the innovation. As with people, the way money flows through government and from government to innovation partners enables innovation and is itself the object of innovation.

A few themes have been observed in this area:

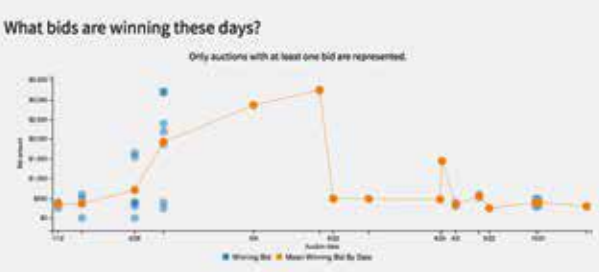
- Governments are working to build a workforce of innovators through cross-government networks and a focus on skills
- Governments are creating innovation funds to promote innovation from within, and novel procurement mechanisms to bring innovation in from the outside

KEY RECOMMENDATIONS

- **Do not accept the system as a given**
- **Undertake systems analysis through an innovation lens**
- **Invest in human capacity**
- **Encourage cross-government networks**

CASE STUDY: **Spreading Innovation**

Many innovative solutions exist within and across governments; however, it is often difficult to systematise the diffusion of innovation because potential innovators often lack the tools to help them replicate good ideas. To overcome this challenge, the National Centre for Public Sector Innovation (COI) in Denmark has developed *Spreading Innovation,* a step-by-step guide to help replicate innovations in new contexts.



CASE STUDY: **Micro-purchase Platform**

Procurement is a critical but complex element of government programmes and can be a barrier to innovation. 18F, a digital service innovation team in the United States government, has turned procurement rules on their head by launching the Micro-purchase Platform, an auction system that leverages legal flexibilities to obtain software development through simple credit card purchases.

Introduction

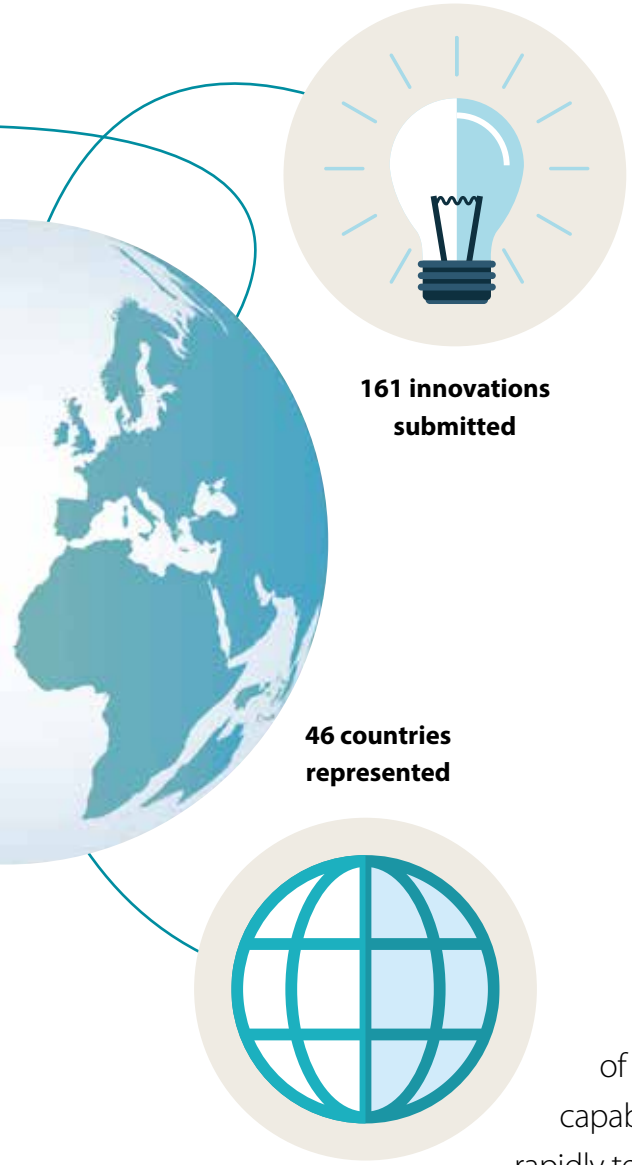
Government innovation uses new approaches to create public value for individuals and for society. It is changing how the government operates to deliver better outcomes, such as better use of public resources, more open and trusting societies, and strengthened justice and care for citizens from all walks of life.

The benefits of innovation are clear, and the economic and social challenges that governments are facing require new approaches to overcome pressing societal problems in a fast-changing environment. However, innovation is complex and challenging for governments for a variety of reasons. Developing innovation and countering risk aversion in large government bureaucracies, which are among the largest organisations in the world and have a critical role as a steward of public money, can be challenging. To better understand the challenges and opportunities governments face, the OECD Observatory of Public Sector Innovation (OPSI),[1] part of the Public Governance and Territorial Development Directorate (GOV),[2] has been working to identify the key issues for innovation in government and what can be done to help governments transform the way they do business and achieve greater impact.

Innovation is a constantly evolving practice, and learning its trajectory is important to understand the implications for governments of the future. To learn from governments on the leading edge of this field, and to strengthen the global knowledge base in this area, OPSI has partnered with the Government of the United Arab Emirates (UAE) and its Mohammed Bin Rashid Centre for Government Innovation (MBRCGI), within the framework of Middle East and North Africa

1. See *http://oe.cd/opsi*. OPSI may be contacted through the email address *opsi@oecd.org*.

2. See *www.oecd.org/gov*.



(MENA)-OECD Governance Programme,[3] to conduct a global review of new ways in which governments are transforming their operations and improving the lives of their people. This global review is designed to enhance development and replication of solutions to solve common challenges. This year-long process has included extensive research into innovation trends in OECD member countries and non-members alike, as well as a two-month open "Call for Innovations"[4] to identify examples of innovative practices in governments worldwide.

Research conducted by OPSI and the work for the Embracing Innovation in Government: Global Trends highlighted one main point: governments are grappling with major questions – how to make the most of technology, how to work with citizens and draw on the capabilities of society at large to address needs, and how to rapidly test new approaches and ways of working in a fast-changing world. Drawing on the work of the OECD and the experience of countries and their case studies, this review identifies six trends that demonstrate cutting-edge practices and the paths governments are taking to use innovation to meet growing challenges and citizen expectations (see Figure 0.1). This report is prepared for the 2017 World Government Summit in Dubai,[5] which brings together thousands of government officials, thinkers, policy makers and industry experts from over 100 countries to discuss ways to harness innovation and technology to solve the challenges facing humanity. One of the features of the summit is the *Edge of Government*, a series of interactive exhibits that bring innovations to life. These exhibits centre on the trends highlighted in this report and include exhibits on case studies presented here.

3. See *www.oecd.org/mena*.

4. See *http://oe.cd/wgs17*.

5. See *https://worldgovernmentsummit.org*.

Figure 0.1: Trends identified through this review

Pairing human and machine

Zoom in or zoom out: scaling government

Citizens as experts

Mass or personalised services

Experimental government

Breaking the norms

These six trends serve as the backbone for the structure of this report, and each includes a discussion of their associated challenges and success factors, recommendations for action and real-life examples of the trend in action. The trends are:

1. **Human and machine: pairing human knowledge with innovative tools.** Governments are finding new and creative ways to combine the knowledge and experience of humans with machine-generated data and tools to improve government services. From PetaBencana.id's crowdsourcing of flood conditions in Indonesia to the UAE's Extreme Weather App, which warns citizens of dangerous weather conditions such as sandstorms, governments and their partners are combining the insights of citizens with the logic and processing power of machines in innovative ways.

2. **Zoom in or zoom out: scaling government.** Advances in government processes and technology are enabling government to conceive new ways to scale government services for the general public, and to revolutionise conceptions of what scale means. New ways are being found to more effectively bring innovative practices into government and to scale them from small to large, such as through transformation teams and innovation labs. Potential solutions are also being identified at a scale not previously possible, both at the small end of the spectrum (e.g. nanotechnology) and the large (e.g. harnessing Mexico City's large population to quickly and cheaply map the city's bus routes through a GPS-enabled crowdsourcing game).

3. **Citizens as experts: redefining citizen-government boundaries.** Countries increasingly recognise that good ideas may come from outside the walls of government. By supporting citizen-driven innovation, governments can learn new ideas and approaches, while promoting trust and inclusiveness in society. This occurs by importing insights into government, such as through the innovative Agents of Open Government initiative in São Paolo, Brazil, where citizens teach courses on open government to civil servants. Countries are also using technological tools to catalyse citizen innovation, such as though Finland's Place to Experiment online platform, which connects citizen innovators with government and crowdfunded resources to find new ways to strengthen government programmes.

4. **Mass or personalised services: the next generation of service delivery.** Traditional approaches to service delivery are coming to an end. Innovative governments no longer require citizens to know the organisational chart of government in order to obtain services, but instead design user-centred services that view citizens holistically, and recognise that each individual has specific wants and needs. The tools commonly used by the technology trade – such as user-centred design and agile development – are being applied to public service delivery. This can be seen in the way Santa Monica, California, in the United States is combining the science of wellbeing with government data to tailor services to improve the quality of life of its citizens. In Warsaw, Poland, similarly citizen-focused civil servants are consulting with blind residents to deploy a network of beacons to allow those with visual impairments to move about the city and gain independence.

5. **Experimental government: small bets with big potential.** To keep up with the rapid pace of change, governments are realising that they need to experiment with new possibilities and quickly establish which approaches work and which do not. To do this, they need to create a culture that allows experimentation to become second nature. This can mean developing new policies to allow a country to serve as a testbed for experimentation, such as in the case of Finland's Design for Government framework. Valuable lessons with potential implications for government may also be learned from civil society experiments, such as the use of blockchain to create a voting process for a Colombian peace plebiscite.

6. **Breaking the norms: rethinking the machinery of government.** Major innovations that have had a real impact include changes to the structure, people and funding of government itself. Governments are looking "under the hood" to transform services from the inside out. Civil servants represent the brains of government, and financial resources represent the lifeblood. To build a better foundation for innovation in the public sector, governments are coming up with new approaches to both human and financial resource management. This is illustrated by Denmark's *Spreading Innovation* dialogue tool, which encourages employees to share ideas, resulting in bigger successes and enhanced innovative capacity among staff. On the financial side, the 18F group in the United States government has created the Micro-purchase Platform to leverage regulatory flexibilities and provide an automated online auction system for software development.

Cross-cutting factors that impact innovation

Each of these individual trends comes with certain challenges, as well as contributory factors that can impact the ability of governments to accomplish their goals. Some of these are specific to an individual topic; however research for the review has identified four core cross-cutting factors that can unlock innovation across the board.

Overcoming bureaucratic barriers

Internal regulations, procedures and structures – and the behaviours they generate – may inhibit innovation in the public sector. Innovative governments are finding ways to overcome these barriers by using approaches ranging from problem-oriented innovation teams to cross-government innovation networks, and from user-centred design to fostering the free-flow of data and information across and beyond the public sector. Without a means to negotiate bureaucratic barriers, innovation may meet with success within different organisations, but will never spread across government.

Harnessing the power of citizens' ideas and the people behind them

Bringing down barriers is not limited to inside government, as the walls themselves must be re-imagined and made permeable to enable two-way dialogue between government employees and the public. To generate new ideas and ensure services are meeting the needs and demands of citizens, governments must work in real partnership with citizens. This goes beyond simple consultation exercises – it involves the co-creation of policies and services with people who best understand how these things ultimately affect their community and society at large.

Building open, transparent and trust-based relations with citizens

Engaging with the public is a critical enabler of innovation, as is harnessing the technological developments currently reshaping the world economy to also reform government, as discussed throughout this report. However, these things must be done in a transparent manner that fosters trust in government programmes and civil servants. This trust will help ensure citizens become willing and interested participants and contributors in innovating government programmes, and embrace the outcomes and have confidence in their legitimacy. Over time, this approach can result in a cascading process of continuous innovation, where the public is not only a contributor but also a major supporter. If governments are not transparent and trust is not gained, citizens and residents may resist changes in government initiatives and avoid participation.

Enabling a culture that supports innovation

Culture is perhaps both the biggest enabler and biggest barrier to government innovation. Officials in entrenched conventional cultures can be reluctant to take the initiative, support efforts to better connect civil servants within government or to citizens, or to be transparent and open to public scrutiny. However, government employees who are encouraged to be open and innovative, and who recognise the value and impact that innovation can have inside government and to the people it serves, are more likely to build a foundation that unlocks the other factors listed above. Government culture is created both from the top-down with support from the most senior levels of leadership, and from the ground-up through the development of skills and tools that every public servant can use to innovate.

Recommendations

No country or city government has yet managed to fully implement the above factors. However, this should not discourage governments, as continuously striving for improvement and excellence is at the heart of innovation. Governments can focus on the following areas in particular to maximise the potential for innovation.

1. **Signal innovation as a priority.**
   This can be done through political support and capacity building. Innovation is unlikely to take root in government unless senior leaders communicate that it is an important priority. This includes acknowledgement that sometimes failure is an acceptable outcome. This empowers civil servants to try new approaches and take calculated risks. Their capacities should also be strengthened by reinforcing their innovation skills.

2. **Enable connections across and beyond government**
   This includes fostering communication and information sharing across and beyond government, by harmonising rules and developing connection points and networks. Civil servants should have at their disposal means of connecting with each other formally and informally, and for connecting with the public. Government can foster these connections by building cross-cutting networks and providing platforms for collaboration across organisations and sectors. Governments should enable these connections through clear policy that ensures civil servants are empowered to reach across boundaries, have conversations and share information.

3. **Promote trust through transparency and responsiveness.**
   In order to build long-term innovative capacity, citizens must trust that the government has their best interests at heart; otherwise they are unlikely to cooperate with user-centred approaches and accept the outcomes of new policies and services. Governments can help build this trust by being open about activities and decisions that affect people. However, transparency is not enough. Citizen input must be considered and acted on, as appropriate, in visible ways.

4. **Forge partnerships with all relevant players.**
   Although many countries are insourcing and building up skills and abilities inside governments, government cannot do it all. Strategic and ongoing partnerships must be forged with civil society organisations, businesses, experts and the public. Each of these has unique strengths and competencies, and innovation in government accomplishes its biggest successes when all three come together. Civil servants must therefore have the ability to balance and interpret the sometimes competing priorities of these different groups, and be empowered to make decisions on how to proceed with what they learn. Governments from other jurisdictions and countries can also serve as useful partners, as many share common challenges and may have devised solutions that can be replicated or learned from.

Trend 1
Human and machine: pairing human knowledge with innovative tools

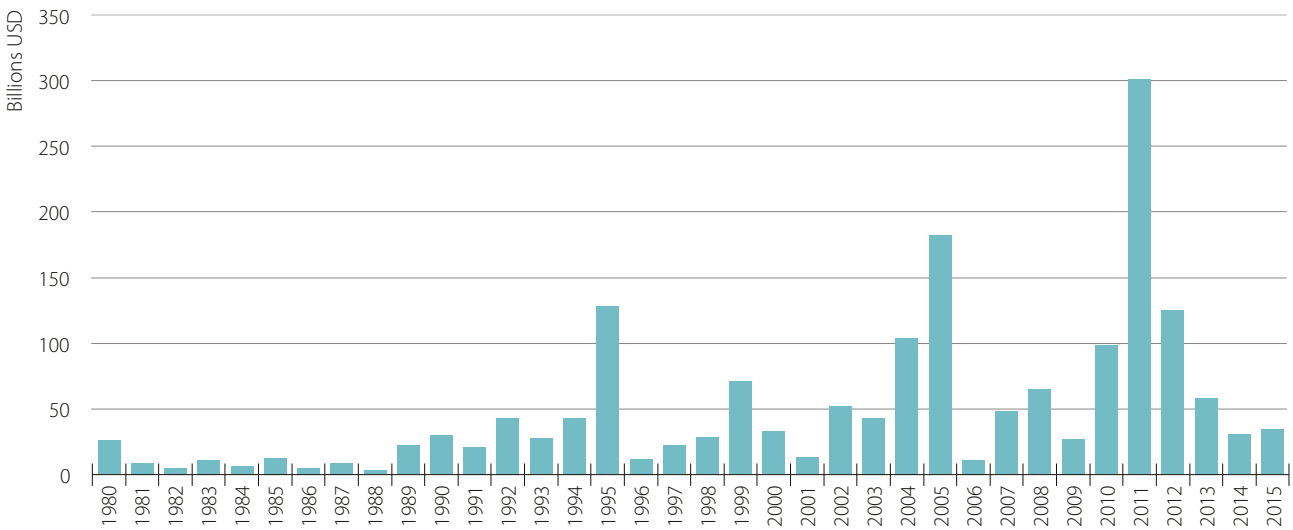
Governments around the world are making increased use of innovative tools to anticipate and understand the complexity and uncertainty of societies and nature. From big data analytics to smart cities, drones to social networks, and predictive algorithms to machine learning, technology is enabling governments to better monitor both the physical environment and the daily concerns of citizens. These can support government decision-making and be used in new ways to interact with citizens, in particular by automatically detecting anomalies and forecasting potential crises that require government action. These tools are not autonomous, however. Adept individuals are needed to use them and interpret their results. Several core trends have been observed in this area.

GOVERNMENTS ARE IMPLEMENTING INNOVATIVE EARLY WARNING SYSTEMS IN RESPONSE TO INCREASINGLY COMPLEX AND SEVERE CHALLENGES

Political leaders and risk managers everywhere are facing a range of new crises, such as industrial accidents, terrorist and cyber-attacks, long-lasting social disruptions, pandemics and natural disasters including flooding, earthquakes and tsunamis. The unprecedented nature, scale and complexity of many of these shocks, as well as their transboundary and cascading effects, require new approaches to anticipate these events and mitigate their consequences. The aim is to reduce adverse socio-economic effects (Figure 1.1), such as the USD 1.5 trillion in economic damage suffered by BRIC[6]

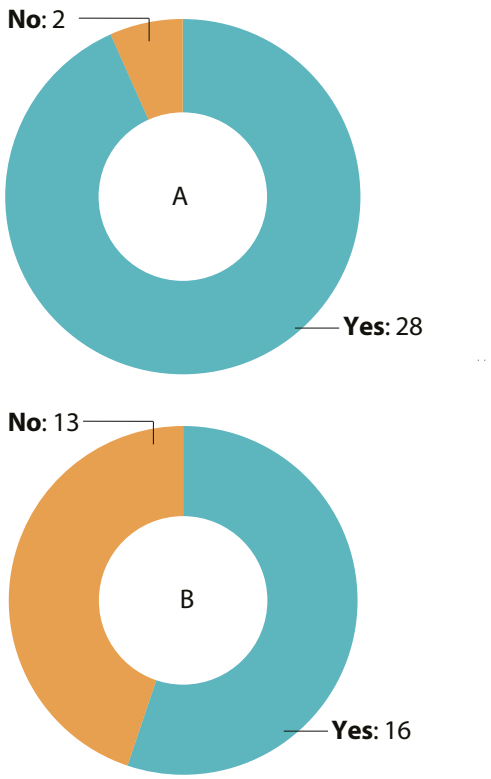
6. BRIC is a grouping acronym that refers to the countries of Brazil, Russia,

Figure 1.1: Economic losses in OECD and accession countries, 1980-2015



Source: EM-DAT (2016), *OFDA/CRED International Disaster Database*, www.emdat.be (accessed 1 December 2016).

Figure 1.2: Mechanisms for (A) situation awareness and (B) complex crisis anticipation



Note: Total number of responding countries 30/30 for (A) and 29/30 for (B).
Source: OECD Survey on Risk Governance (2017a).

and OECD countries from human and natural disasters in the last decade alone (OECD, 2014).

Technological advances have led to significant improvements in early warning systems both at national and international levels. Weather phenomena, infectious disease outbreaks, volcanoes, tsunamis and other hazards are now continuously monitored in all OECD countries and in many others around the world. The *PetaBencana.id* flood-mapping tool in Indonesia and the Extreme Weather App in the UAE are good examples of the combined use of technology and human intervention for risk prevention and management (see case studies at the end of this tend). The recent OECD survey on risk governance (OECD, 2017a) shows that all OECD countries now have mechanisms and systems in place to monitor crisis situations and build situation awareness. These diverse systems are now better linked with emergency preparedness and can trigger warnings to the population and activate emergency plans. However, only 16 out of the 29 countries surveyed have established mechanisms to anticipate unprecedented or more complex crises that do not correspond to past events (Figure 1.2), which suggests room for innovation.

Not all innovative warning systems are technological in nature. Some more nuanced detection systems help to identify societal ills that are less evident than crises or disasters. For instance, the *Edge of Government* exhibit highlights the example of training barbers in London to detect early signs of depression in vulnerable communities and connecting the individuals concerned with preventative help before they reach crisis point.[7] While this case is not strictly a public sector initiative, it provides insights into approaches and ideas that can help governments identify and address challenges in their communities.

THE EXPONENTIAL GROWTH OF DATA UNLOCKS INNOVATION IN MONITORING AND PREDICTION SYSTEMS

The constantly increasing availability of open data and data from social media, combined with the global multiplication of sensors linked to mobile phones, smart cities, the Internet of Things (IoT), CCTV cameras, drones and satellites, is generating previously inconceivable volumes of data on the physical and social environment. In just three years, the number of SIM-connected IoT devices in OECD countries grew from 72 million to 124 million (OECD, 2016a). Innovative governments are taking advantage of big data from these machine sensors to develop new approaches to understanding and predicting trends affecting societies.

These machine-generated data are now also being combined with citizen-produced data and government data to support early warning and indicator systems and gather new insights for strategic policy making. This review identifies Indonesia as an emerging leader in the development of innovative ways to handle crises, serving as a testbed for innovation that has potential for much bigger replication. Through their Food Security Early Warning System – a partnership between the government

India and China, which are all deemed to be at a similar stage of newly advanced economic development.

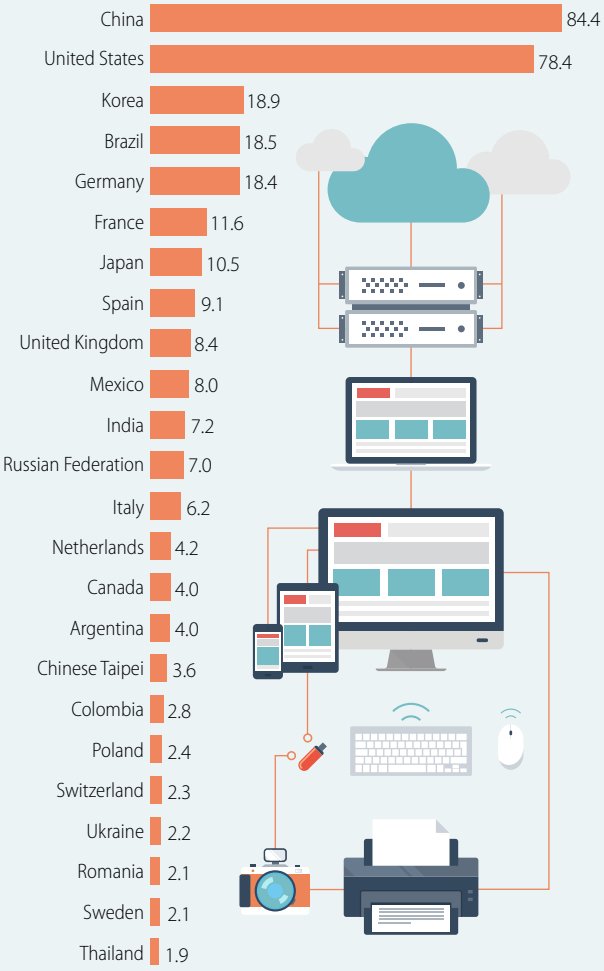
7. See *www.independent.co.uk/life-style/health-and-families/features/barbers-are-receiving-first-aid-training-in-mental-health-so-could-they-offer-the-best-talking-cure-a6882216.html.*

and the UN Pulse Lab Jakarta – government data have been combined with crowdsourced price tracking of food products sold on markets in remote areas to track price fluctuations and shortages that can occur in emergencies. This is done by gathering photos of marketplaces produced by citizens with their smartphones. Smartphones are also used, in combination with hydraulic sensors, to map flood levels in Jakarta and other Indonesian cities through real-time Twitter postings of flood photos, as discussed in the *PetaBencana.id* case study at the end of this trend. Such human-machine interactions transform smartphone holders into innovative sensors monitoring their immediate environment. Indonesia is by no means alone in its use of such approaches, with other uses beyond crises becoming more commonplace.

Satellite and drones are also contributing to human-machine synergies. They are now used to generate remote-sensing data to monitor the physical environment and human activities across the globe, even in inaccessible areas. In the Namibia Kuzikus Wildlife Reserve, aerial imagery from drones has allowed rangers to track the wildlife population. The rangers have brought in indigenous partners to help contextualise the data, further illustrating how humans and machines can augment each other. Satellite sensors are becoming increasingly accurate; for example, they can now gather precise information to help calculate global oil inventories by tracking the shadow of oil tanks as a proxy for the depletion of their tanks. This technology, developed by the start-up Orbital Insights, has numerous applications and offers government partners the ability to make informed economic decisions in a way that would have been impossible or prohibitively expensive if reliant on manual techniques.[8]

To further catalyse innovation, governments are increasingly opening their data for public consumption in the form of Open Government Data (OGD), with leading countries taking a position of "open by default" and actively stimulating the re-use of data by actors within the open data ecosystem. The re-use of OGD ultimately expands the innovative potential for government, industry and the public alike. Making data available, easily accessible and reusable allows data to flow freely, enabling ideas to be shared and built upon and helps avoid duplication and unnecessary reinvention. The closed-off traditional model promotes fragmentation that scales from individuals to organisations, organisations to individual governments, and individual governments to the global economy. The OECD has developed the OURData Index to identify global leaders, as well as areas where efforts should be focused in countries' open data policies to ultimately fuel innovation (see Figure 1.4). For additional information on the characteristics of OGD policy implementation by country, see Appendix I.

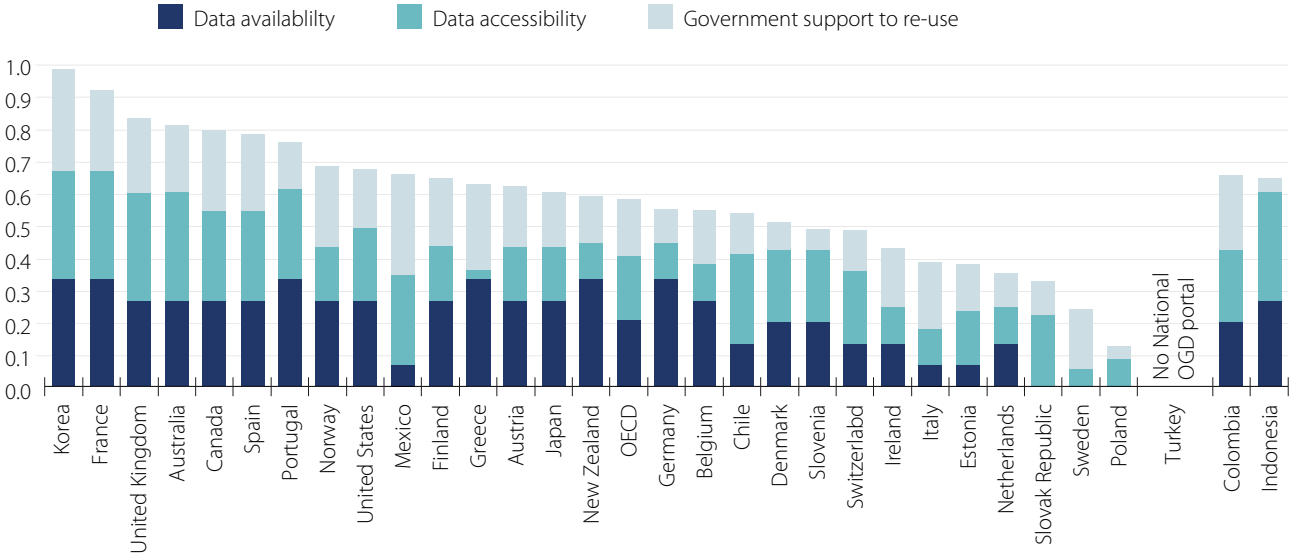
Figure 1.3: Trends in IoT devices: Top 24 countries with online devices



Source: OECD (2016b)

8. See *https://orbitalinsight.com*.

Figure 1.4: The Open-Useful-Re-Usable Government Data Index (OURData Index)



Note: Data for the Czech Republic, Hungary, Iceland and Luxembourg are not available. Information for Indonesia was collected in 2015 based on the responses provided by the Indonesian government to the 2014 OECD Open Government Data Survey.

Source: Based on OECD (2015a).

WHAT IS OPEN GOVERNMENT DATA?

Open Government Data (OGD) is a philosophy—and increasingly a set of policies—that promotes transparency, accountability and value creation by making government data available to all. Public bodies produce and commission huge quantities of data and information. By making their datasets available, public institutions become more transparent and accountable to citizens. By encouraging the use, reuse and free distribution of datasets, governments promote business creation and innovative, citizen-centric services and businesses.

Source: *oecd.org/gov/digital-government/open-government-data.htm*

PROGRESS IN DATA ANALYTICS HELPS GOVERNMENTS UNDERSTAND COMPLEXITY AND TAKE ACTION

Capabilities to track social phenomena and man-made threats have also improved dramatically in recent years, with more and more OECD countries setting up technical platforms to monitor social networks. These platforms can act as a way to identify red flags and understand more accurately what is happening on the ground during a crisis (Mickoleit, 2014; Wendling et al., 2013).

One such example is Twitcident, developed at the Delft University of Technology in the Netherlands and utilised by the Dutch police and fire department since 2011. This tool filters, searches and analyses Twitter information streams during incidents. The system monitors emergency broadcasting services and when an incident is reported, the system starts to filter and aggregate relevant tweets. First responders and affected citizens can then use Twitcident's filters to access relevant information, such as during the 2011 storm that hit the Pukkelpop music festival in Belgium and resulted in casualties.

Algorithms are developed to automatically detect situations that require government action, ranging from inappropriate behaviour in the street, key words on social media, traffic congestion or increased use of an online government service. For instance, police increasingly use CCTV systems combined with facial or behaviour-detection algorithms to detect potential threats. Financial markets detect trading trends almost instantly, and smart cities operators know in real time when pollution levels exceed pre-established warning levels.

The ability to know almost instantly what is happening across society combined with increased automation has permitted the development of planned automatic responses to preconceived situations. Nowadays, approximately 70% of all financial market transactions are made by automated trading algorithms, which take and implement decisions to buy or sell on behalf of their clients (Helbing, 2015). Such practices are starting to take hold in the public realm. Governments in Australia, Canada, China, Europe, Japan, Korea and the United States, for instance, increasingly promote the development of smart electricity grids to automatically make decisions regarding electricity storage and distribution and thus reduce consumption and greenhouse gases emissions (Tuballa and Abundo, 2016). Meanwhile, supercomputers in smart cities regulate traffic by controlling traffic lights (Tuballa and Abundo, 2016).

WHEN TECHNOLOGY IS NOT ENOUGH, ANIMALS COULD MAKE THE DIFFERENCE

It is clear that governments are increasingly turning to technology to help solve their problems. However, some are combining it with a more analogue solution: animals. The Mohammed Bin Rashid Centre for Government Innovation (MBRCGI) is examining ways that governments are leveraging the unique skills and evolved instincts of animals to solve problems that may not be best suited for technology alone. For example, as featured in the *Edge of Government* exhibit, the Government of Peru is using vultures to help address the massive and growing problem of rubbish in the capital city of Lima.[9] Equipped with GoPro cameras and GPS trackers, ten vultures have been trained to locate illegal dumping sites, which can contaminate drinking water and spread disease. The GPS coordinates of the sites are tracked on a live public map.[10]

Challenges

Governments are exploring innovative approaches to understanding, predicting and addressing disruptions and complex issues affecting their territory, critical systems and society. However, the increased use of new tools also brings challenges of its own. Technology plays a key role in risk management, with key government tasks including making sense of complex situations, deciding when to trigger a response to an early warning and gauging the level of the response, as well as communicating with the population to disseminate vital information (OECD, 2015b). These new tools and increased information require judgement calls on the part of human operators. Government officials – sometimes at the highest levels of government – are ultimately accountable for such decisions. This is why such innovations need to be grounded in a holistic human-machine-social framework that enables governments to leverage the digital dividend in an optimal manner.

Quality of information. The massive and growing volumes of data can complicate decision-making for leaders in crisis situations (OECD, 2015b), particularly as new findings may challenge existing practices or warning systems established by governments. If incorrect decisions are made with innovative new methods, especially early on, trust can be undermined. Identifying data inputs that are as accurate as possible is important, as algorithms can identify correlations among data, but do not always consider the accuracy of the information used.

Availability of information. Governments are opening up large amounts of data that can be used to develop innovations targeted at detecting, predicting and understanding complex events. Concurrently, many sources of information and sensors are privately owned by operators of critical infrastructures, such as private utilities or insurance companies. Like governments, businesses have identified data as a core asset, which may limit their willingness to make datasets freely available to the public or government.

Accountability for data-driven decision making. The increasing automation of decision making raises key issues regarding how to guarantee checks and balances (OECD, 2017b). Data scientists and analysts generally do not hold formal decision-making power for government programmes, but by implementing solutions to policy problems through technology they, in effect, participate in the policy-making process. This raises the question of how leaders and organisations can be accountable for data-driven decisions that they do not fully control. This especially applies to automated decision making, as the machine-learning algorithms at the core of data analytics have the capacity to

9. See *www.theguardian.com/cities/2016/jan/29/drowning-rubbish-lima-vultures-gopro-video-cameras.*

10. See www.gallinazoavisa.pe.

do more than provide information. The main issue is not how to prevent machines taking control from humans, but rather how to govern the use of data analytics by humans and design adequate mechanisms for checks and balances.

Control over personal data. Virtually every interaction with a digital device produces data that can be processed to produce information on its user. However, people are often unaware that this information exists and may be re-used to extract insights. This issue raises questions about privacy and the stewardship of data.

Contributing factors

This review has identified a number of contributing factors catalysing innovation in this area:

Capabilities in the public sector to manage and interpret analytics. Industry, and consulting firms in particular, have developed technology and data capabilities in this area that often outstrip government know-how. Because of its scarcity, technical expertise is often outsourced and is generally expensive. Complete insourcing is not necessarily needed or advisable. However, governments that have achieved a foundational level of data literacy (see discussion on skills in Trend 6) are better able to understand the technology and data landscape and generate ideas and frameworks for innovative approaches – and importantly, interpret and act on the results of those approaches once implemented. This also gives them the ability to evaluate the services being delivered by external parties, the quality of analysis and results, techniques and the appropriateness of automated decisions. This not only allows for governments to find ways to use these approaches to innovate, but also contributes to a culture that supports innovation through evidence.

Robust legal and regulatory frameworks for data governance. Governments that manage data as an asset help to mitigate the inherent privacy and security risks that come with expanding human-machine interactions. In addition, when properly managed through sound governance, data are more easily discovered, exploited and shared within government and with the public through connection conduits such as data portals. When done well, these conduits can help nullify the negative effects of government siloes and bureaucratic barriers. Government waste and the burden on citizens is reduced as well, as governments no longer possess duplicative data collections and can refrain from asking citizens the same question each time they seek a service. Estonia, for example, has adopted the "only once" principle, whereby the government can only ask a citizen the same question once. A final aspect of data governance is data release. Open-by-default data policies encourage countries to consider the downstream uses of data from the moment it is collected, which can help enable promote innovation as the data flows through the government to the public arena.

Transparency and citizen engagement. As discussed above, using data and algorithms to drive innovation in government can have positive and negative effects, such as new ways of thinking but also less direct control over decision making. These new methods work best in governments where the data collected and algorithms used can be viewed and discussed by the public, within legal boundaries. Once data are opened up, the positive effects can cascade outward from government and compound in value. Rather than relying only on government officials to make better decisions, OGD allows thousands or millions of citizens to make better decisions as well, such as in the *PetaBencana.id* case study.

Recommendations

In this context, where increasingly available datasets and innovative technologies hold the promise for governments to better understand and connect with the physical environment of the societies they govern, government officials should:

1. **Manage data as an asset for many uses and users.** Promote a legal and regulatory framework that manages data as an asset throughout its lifecycle and considers from the point of collection that data could have many users and uses. This framework should be promoted from the top to ensure it is seen as a priority. It should also allow for horizontal visibility of data collection, enabling governments to know what data has been collected and how it is used across government. This will help overcome bureaucracy and also enable cross-government sharing of the data. The framework should also be open to the public, and should also take into account data brought into government from industry or other sources, as well as ways to foster partnerships and beneficial contracts that encourage this process.

2. **Open data to fuel innovation.** Participate in and strengthen the open data ecosystem to increase the availability, accessibility and re-use of OGD to catalyse innovation. This should include the development of data capabilities and a data-driven culture in government and two-way dialogue with data users both inside and outside government, as innovations start with individuals.

3. **Develop open checks and balances.** Ensure the existence of a system of checks and balances for data-driven decision-making within a holistic human-machine-social framework, in order to increase the quality and accountability of these decisions. This should include steps where human knowledge and intuition are applied to make judgements on the value and weight of data inputs and on how to use results. This should also include opening up the public algorithms used for automated-decision making (see the example of the French Tax Calculator in Trend 4), with conduits for open two-way dialogue as the ultimate check.

4. **Integrate resilience in system design.** Complementing automatic decision-making systems with lower tech approaches is key to ensuring the resilience of societies. The increased use of innovative automatic decision-making systems by governments to understand and predict the physical environment calls for the integration of resilience in their design at an early stage. Robustness, redundancy and adaptability are essential features to ensure systems resilience and guard against the systemic failure of tools upon which societies and economies are increasingly dependent for their daily functioning.

CASE STUDY

PetaBencana.id – Indonesia

SUMMARY

"Selfies save lives" This is the motto of *PetaBencana.id*,[11] a tool that combines data from hydraulic sensors with citizen reports over social media and civic applications, including via Twitter, to produce real-time flood maps in Jakarta – and soon, other cities in Indonesia. These web-based, publicly accessible maps now provide the best available flood information for the government and residents. *PetaBencana.id* started as *PetaJakarta*, which focused on only the city of Jakarta, but is now scaling to cover more cities in the country.

11. See *www.petabencana.id.*

THE PROBLEM

Greater Jakarta is the world's second largest megacity, and experiences regular flooding during the seasonal monsoon. Forty percent of Jakarta is below sea level, and is sinking by up to 6 cm per year. Climate change and sea level rise can only worsen this situation in the coming years. Flooding has a serious impact on the 30 million residents of the Jakarta area, as well as its business activities and government services. Furthermore, rapid urbanisation and population expansion over recent years have intensified Jakarta's exposure and vulnerability to flooding risks.

The complex water system of this large metropolitan area and the tropical weather conditions make it hard for technical government agencies to model the floods. As a consequence, risk managers lack sufficient accurate information to target emergency interventions and support populations, and citizens lack adequate knowledge of the situation as it develops.

AN INNOVATIVE SOLUTION

Jakarta has one of the highest concentrations of Twitter users in the world. When flooding occurs, the flow of information from social media networks precedes official warnings and more closely reflects reality on the ground. However, such information can also create confusion if not properly channelled. The developers of *PetaBencana.id* recognised that citizens of Jakarta regularly seek and share relevant information on social media, in order to adapt to traffic disruption, school closures and other adverse effects of flooding on their daily activities, and realised an opportunity existed to make use of this data.

PetaBencana.id draws upon this wealth of information from "human sensors", and complements it with scientific data from hydraulic sensors, to construct real-time models and maps of flooding. This innovative approach builds on the widespread use of social media and is founded on the premise that citizens have access to the most accurate information regarding flooding conditions at the local level. *PetaBencana.id's* maps are widely used to inform citizens, emergency responders and government agencies during flooding emergencies.

But how does PetaBencana.id work in practice? The system is programmed to react when someone in Jakarta tweets the word "banjir" (flood) and tags @PetaJkt. *PetaBencana.id* automatically replies, and asks them to confirm the tweet with geotagged photos. The platform then combines all incoming reports with official data from the city government to build an up-to-the-minute, online flood map. The maps are then made publicly available to both citizens and public authorities. This innovative tool is powered by "CogniCity", [12] a free and open source software (FOSS) app to produce visualisations at the megacity scale using social media information. *Petabencana.id* was its first practical application.

12. See *https://youtu.be/O7VDjjeEdN8.*

LI Flooding in Jakarta.

Screenshot from Twitter report to PetaBencana.id.

One of the strengths of *PetaBencana.id* is the partnership established between academia – the project is led by the Urban Risk Lab at MIT – the non-governmental organisation (NGO) *PetaBencana.id* and the government. The Jakarta branch of the National Disaster Management Agency (*Badan Nasional Penanggulangan Bencana* – BNPB) supported this project from its early design phase, working closely together to ensure that *PetaBencana.id* would contribute effectively to BNPB's operations. During the co-design phase, the software designers carefully mapped BNPB's Standard Operating Procedures for monitoring flood events, activating emergency plans and warning the population, in order to integrate *Petabencana.id* into existing processes and data flow lines.

Building trust among the partners proved essential to gaining access to official data, thereby making *PetaBencana.id* a better tool. *PetaBencana.id* integrates data from multiple government platforms, enabling the system to efficiently crosscheck and corroborate reports, and assess and analyse connectivity between different infrastructure systems including water, transport and energy.

Map from local Jakarta version of PetaBencana.id.

NOVELTY

PetaBencana.id is the first online tool to produce real-time maps of urban flooding, driven by social media reporting. It represents a major advance on previous static PDF maps, which were produced every six hours. It significantly improves service quality by gathering and disseminating accurate real-time flood data, which is immediately made accessible to government and the general public.

IMPACT AND RESULTS

In 2016, the project's Twitter feed for Jakarta (@PetaJkt) had more than 50 000 followers and received nearly 10 000 tweets providing flood information to the platform, underlining the significant involvement of Jakarta citizens. Furthermore, since 2015 BNPB has used the platform as part of its daily emergency management operations, representing a breakthrough in information exchange with citizens. In support of this innovation, the Governor of Jakarta has called on residents to report flooding as part of their civic duty.

REPLICABILITY

PetaBencana.id is based on CogniCity free and open source software, the code for which is readily available online.[13] Initially developed for Jakarta, its expansion to other cities in Indonesia, including Bandung and Surabaya, is ongoing. Other countries such as Australia, India and Viet Nam are partnering with the MIT Urban Risk Lab to replicate this innovation for major cities facing flooding risks. Both the United State Federal Communications Commission and the International Federation of the Red Cross and Red Crescent recommended *PetaBencana.id* as a model for disaster information crowdsourcing platforms, which could also be expanded to other disasters.

CHALLENGES AND LESSONS LEARNED

PetaBencana.id developers emphasise the importance of building comprehensive and long-term partnerships among co-users to ensure the sustainability of such systems, government buy-in and trust among partners. This collaborative approach to design and development has enabled *PetaBencana.id* to produce positive outcomes for citizens and policy makers, as all parties benefit from their mutual and collaborative participation. It is also important to promote participation among citizen, as their contributions constitute the backbone of this social media-based innovation. Building trust among the partners proved essential to gaining access to city data.

13. See *https://github.com/smart-facility/cognicity-server.*

K City of Jakarta incident control room

Extreme Weather App – United Arab Emirates

SUMMARY

The Extreme Weather App[14] is a freely accessible application that alerts citizens, especially ones with health problems, and government about current and future weather conditions at their current location using a smartphone or web browser. Launched in 2016 by the UAE's Masdar Institute of Science and Technology, the app is powered by a series of algorithms using real-time satellite data and weather forecasting models. It is one of the first to specialise in detecting and predicting sandstorms, which pose a major challenge in the Middle East, especially for those with medical conditions such as asthma.

14. See *https://atlas.masdar.ac.ae/forecast.*

JL Dust storms in the Middle East.

THE PROBLEM

Sandstorms can be a major disruptive force in this Middle East. In 2015, one storm alone was powerful enough to cause extremely low visibility, resulting in hundreds of car accidents and significant flight delays and school closures, causing damage to the economy (Solomon, 2016). The high levels of mineral dust and pollutants in the air can also trigger severe asthma attacks, respiratory diseases and infectious diseases. These storms can even render solar panels ineffective and have detrimental effects on agricultural crops. Recent research has found that severe dust storms are occurring more frequently in the UAE, accelerating the need for a reliable and accurate solution (Solomon, 2016).

AN INNOVATIVE SOLUTION

Scientists and technologist at the Masdar Institute of Science and Technology sought a new solution to the longstanding problem of sandstorms, which are composed of dust mites, microbes, pollen and sand crystals. In 2016, they launched the Extreme Weather App to allow users to view current conditions through near-live maps, and to alert citizens, especially ones with health problems, when situations deteriorate or a storm event is imminent. Despite its advanced design and functionality, the app was developed and shipped in just over one year.

NOVELTY

Although a few other dust models exist, the Extreme Weather App is able to provide a highly precise estimation of aerosols over the region, which allows both individuals and government organisations to better prepare for storms. This is possible due to the fact that the innovation team is the first in the Middle East to use the regionally adapted three dimensional chemistry transport model CHIMERE,[15] an open source model for dust and air quality forecasting and simulation that allows researchers to enter weather and land surface variables such as wind speed, humidity and soil composition, in order to produce forecasts of dust and other aerosol/gaseous pollutant species including ozone (Solomon, 2016).

The Masdar Institute's approach is also innovative in that it focuses on complex real-world problems with a multidisciplinary approach. The app pairs the regional expertise and practical knowledge developed at the research institute with sophisticated Earth-observation technologies and scientific modelling to obtain very specific climate characteristics of desert areas such as those found in the UAE.

15. See *www.lmd.polytechnique.fr/chimere.*

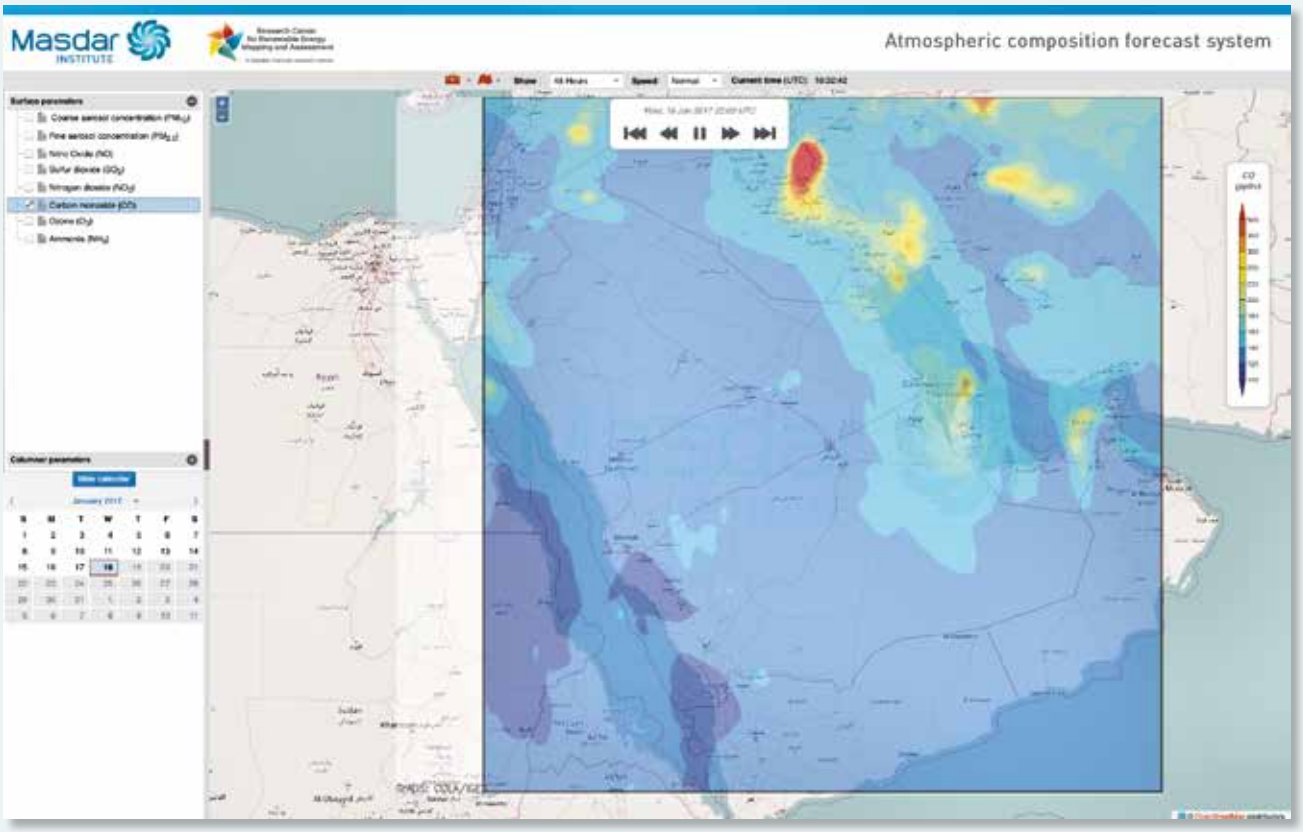
Extreme Weather App in browser (*Source:* The Masdar Institute).

IMPACT AND RESULTS

The app represents a turning point in the region's ability to properly manage the impacts of dust storms. Its introduction enables the government and citizens to better predict and prepare for dust and sandstorms. This allows the UAE to more effectively and efficiently manage health, environment and climate policy – all key socioeconomic sectors affected by dust storms – and provide advanced warning ahead of extreme dust events in order to reduce the risk to human life.

The algorithms and models used in the app have been peer-reviewed and validated by top scientists in the atmospheric science field (Naseema Beegum et al. 2016).

Extreme Weather App on smartphone (*Source:* The Masdar Institute).



Extreme Weather App in browser (*Source:* The Masdar Institute).

REPLICABILITY

Dust and sandstorms are a common problem in the Middle East, and the app can be replicated to address similar problems in other areas. The CHIMERE model is open source, enabling others to freely download the source code and apply it to their own work. However, the scientists at Masdar state that one of the keys to the app's success is knowledge of conditions specific to the regional area. Other countries seeking to develop similar technology should ensure that they rely on human insights based on experience as much as they do technology. The tool is useful not only for citizens and government policy makers, but also for other sectors as well. For example, transportation and traffic safety officials can benefit from the tool, as it can provide motorists, pilots and air traffic controllers with advanced warnings of dust, so they can take action to mitigate risk.

The tool is designed to be versatile and expandable, which opens the door to additional features able to track a variety of parameters. For example, air quality indices, road visibility, surface temperatures and water quality could all be added to the algorithms and maps to further enhance its utility for minimising storm casualties, adverse effects on human health, and economic damage.

CHALLENGES AND LESSONS LEARNED

The main challenges with the app are technical in nature. The initiative has only recently become possible, as significant computing power is needed to bring together weather models and satellite data to produce weather information that updates every few minutes.

Trend 2

Zoom in or zoom out: scaling government

One of the trickiest aspects of government involves scale. In terms of innovation, this means establishing how to scale an innovation initiative from small to large once it has demonstrated its value. This approach has long been regarded as the optimal approach to innovation, as it provides opportunities to adjust and adapt based on user reactions and lessons learned, and allows potential failures to happen quickly before significant resources are invested. This involves increasing the number of beneficiaries, as well as the level of financial resources, staffing and infrastructure dedicated to ensuring the innovation takes root and succeeds. Increasingly, however, scale has come to take on a second meaning, as technological advances allow governments to re-evaluate what scale implies. On the macro side, it involves the use of data and information from an ever-expanding number of sources, while on the micro side it can imply seeking answers to government problems with sources or tools so small they cannot be seen with the human eye. While the concept of scaling itself is growing, so are the number of governments and partners devising interesting new ways to handle scale and push the boundaries of innovation.

GOING FROM MICRO TO MACRO: LABS, TRANSFORMATION TEAMS AND INCUBATORS

Identifying ways to expand small innovation pilots to larger government initiatives is the perennial challenge of government innovation. Luckily, innovative governments are devising novel ways to accomplish this from which others can learn. One approach is to enable the spread of ideas across government, as discussed in the case study on Denmark's *Spreading Innovation* initiative (see Trend 6 of this report). Additionally, government innovation labs are being celebrated as a method of driving innovation through experimentation. More recently, transformation teams and incubators are emerging as a new means to weave new methods and processes into the fabric of government. These approaches is not dissimilar from that of tech start-up incubators, which have proven successful in the private sector, and in many ways established the path that governments are beginning to follow.

Innovation labs

There has been a significant growth in the number of innovation labs in recent years, partly in response to the increased complexity of public policy issues, which require new approaches and new ways of working. The term "laboratory" is borrowed from science and refers to the practice of experimenting – investigating a situation, exploring how it occurs, and testing solutions in a safe and controlled environment. These labs provide an alternative to governments investing time, money and social capital in large-scale policies and programmes that may fail to achieve the results expected. Innovation labs are dedicated spaces for investigating and experimenting through trial and error to understand better what works in public service design and delivery. They often give birth to innovative projects or take the first step in scaling successful ones. At their best, innovation labs consist of governments working in new and often challenging ways to yield results that accurately address the needs of service users and society (OECD, 2017).

INNOVATION LABS: EXAMPLES FROM CHILE, DENMARK AND FRANCE

Denmark's MindLab, based in the central Danish government, uses human-centred design as a way to identify problems and develop policy recommendations.

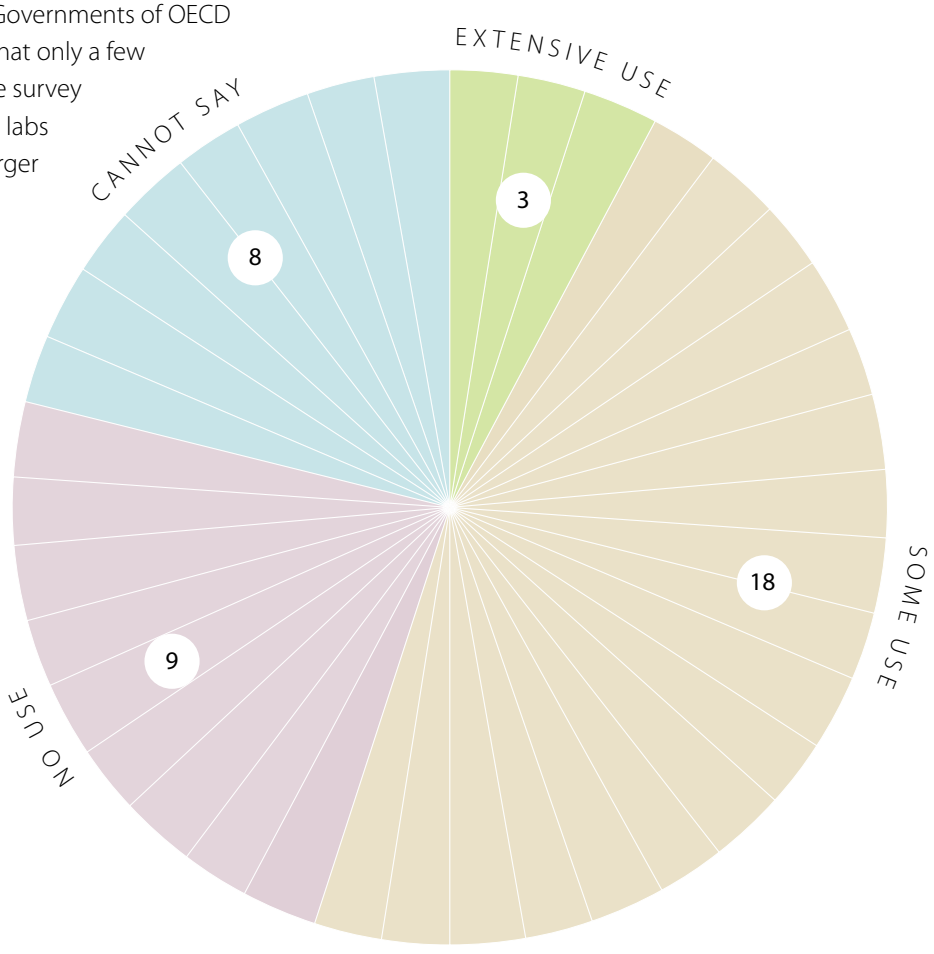
Similarly, Chile's Laboratorio de Gobierno (Laboratory of Government) aims to develop, support and promote innovation processes to create better people-centred public services, with the aim of helping to create a new relationship between government and society. To support this mission, it has three streams of action: (i) innovation projects for public services in high demand; (ii) improving innovation capabilities for civil servants; and (iii) opening public challenges to the private sector through awards for prototype solutions that could improve public services.

Based within the central government in the Office of the Prime Minister in France, Futurs Public is testing new solutions for public sector challenges on a small scale to help create an "ecosystem" that supports innovation. This lab works with NGOs and social entrepreneurs to bring expertise into service design, such as agile software development. Examples of projects include changing how people apply for social benefits, trialling more personalised approaches for disability benefits, and reorganising public services in rural areas.

Source: OECD (2017).

A recent OECD Survey on Strategic Human Resources Management in Central/Federal Governments of OECD Countries (SHRM Survey) shows that only a few countries which responded to the survey make extensive use of innovation labs in national government, with a larger number reporting some use. The rest report no use of labs or were unable to confirm either way, which may illustrate some fragmentation within government.

Figure 2.1: Use of innovation labs/hubs in the civil service across 38 countries



Source: Preliminary results from OECD (2016d).

Designers meeting at GDS.

Transformation teams

This approach creates a new delivery unit with the mandate to oversee and co-ordinate the use of technology to radically transform service delivery for citizens and businesses. With a strong emphasis on bringing in skilled people from the private sector, the talent in these teams rivals that of the world's most powerful tech companies, and in many cases, came from them. They work to knock down silos in order to transform services through government innovation. In these teams, employees with specialised skills and experience in innovative techniques, work hand-in-hand with programme civil servants to bring new ideas to fruition as new tools and services. The United Kingdom's Government Digital Service (GDS) was the first of its kind when it was activated back in 2011, but this concept has only recently began to see rapid adoption in other innovative governments. In the United States, the launch of the United States Digital Service (USDS), whose motto is "by the people, for the people", has digitally transformed services for veterans, immigrants and college students. Newer groups have recently sprouted up, such as Australia's Digital Transformation Agency and a team led by a Digital Transformation Officer in New Zealand (OECD, 2016c). The United Kingdom even launched an international team in 2016 to coordinate with these groups.[16] These teams advocate for the use of agile and iterative practices, which constitute the heart of testing and scaling innovation, and a surrounding supportive culture.

Transformation teams are often engaged for projects due to urgent need or political priority (OECD, 2016c). However, a more business-like model has also emerged. Governments have long turned to consulting firms for solutions, and the United States has launched its own internal consulting firm to work with agencies on a mostly fee-for-service basis. 18F, which launched the Micro-purchase Platform (discussed in Trend 6 of this report), consults with agencies on a variety of topics, including innovating digital products, data, acquisitions and policy.[17] This model could potentially transform the dynamics between governments and external firms. Countries that embark on a transformation teams approach should do so in a measured way, as their potentially disruptive approach may run into difficulties with longer term structural and cultural change across government, given their outsider status and different culture (OECD. 2016c).

16. See *https://gds.blog.gov.uk/2016/08/23/introducing-the-gds-international-team.*

17. See *https://18f.gsa.gov/2015/10/07/digital-economy-practice.*

Incubators

Innovation labs and transformation teams are helping to incubate new forms of innovation inside government, however innovative governments are also reaching beyond the public sector to catalyse innovation in industry for social good. For example, Australia has launched DataStart, a public-private partnership to find, incubate and accelerate start-up ideas that leverage openly available data from the Australian Government.[18] The goal is to identify entrepreneurs who can apply innovation and creativity to uncover new value and solve global problems using open government data. As a result of a national competition, in early 2016 they awarded government funding and mentorship from a leading start-up incubator to CohortIQ, a health start-up that uses hospital and open government data to reduce the estimated 235 000 avoidable hospital admissions each year. Australia sees this as the start of a more comprehensive engagement with the private sector regarding the use of specific government datasets to generate new business, develop new products and services, and create social value. The incubator model is taking root in Scotland as well, where the government launched the CivTech initiative in June, 2016.[19] Based on leading technology incubators, CivTech offers entrepreneurs the chance to compete in open challenges with the aim of bringing in new companies and increasing innovation.

REIMAGINING MICRO AND MACRO: NEW CONCEPTIONS OF SCALE

While scaling innovation both inside and from the public sector demonstrates great promise for expanding the size and impact of innovative programmes, new conceptions of what "scale" means represent the greatest departure from previous approaches. The rapid evolution and often decreasing costs of technology are enabling civil servants to identify or build microscopic sources and tools to support innovation for massive impact, and harness the collective power of people to generate previously unimagined value.

On the micro side, it is now possible for governments to examine issues at a scale not possible earlier. For example, as featured in the *Edge of Government* exhibit, the Metagenomics and Metadesign of the Subways and Urban

L Swabbing for microbes in Johannesburg.

Biomes (MetaSUB) International Consortium – an alliance of 57 cities worldwide[20] –aims to use a molecular view of cities to improve their design, use and impact on health. It is pioneering an unprecedented study of urban mass-transit systems and cities around the world to track and test biological markers left by citizens. These data will be used by city planners and public health officials to discover new species, biological systems and track the movement of diseases, thus enabling an era of more quantified, responsive and "smarter cities".[21]

Also on the micro side, the future hints at nanotechnology as an exciting next step in the evolution of technology, spearheaded by government investments. Several countries have launched initiatives to help make technological advances formerly the domain of science fiction a reality in the near future. The United States, for example, has formed a collective consisting of several government agencies called the National Nanotechnology Initiative (NNI). In late 2015, the NNI announced a grand challenge to create a new type of computer that can proactively interpret and learn from data, solve unfamiliar problems using what it has learned and operate with the energy efficiency of the human brain. The strategy outlines a series of guiding priorities for government-

18. See *http://datastart.wpengine.com, www.dpmc.gov.au/news-centre/data/cohortiq-announced-winner-datastart.*

19. See *www.gov.scot/Topics/Economy/digital/digitalservices/civtech.*

20. See *www.ncbi.nlm.nih.gov/pubmed/27255532.*

21. See *http://metasub.org.*

inspired nanotechnology and a set of challenges (and opportunities) that must be addressed to attain the goal. The challenge involves coordinating and collaborating across multiple levels of government, industry, academia and civil society, in order to look beyond the decades-old approach to computing and chart a new path that will continue the rapid pace of innovation.[22] In July 2016, Federal agencies published a white paper[23] detailing significant progress, including the development of a blueprint outlining the near-term goals of government agencies, as well as opportunities for private sector partnerships.

"This challenge will require the convergence of nanotechnology, neuroscience, and computer science to create a whole new paradigm for low-power computing with revolutionary, brain-like capabilities." [24]

Dr Michael Meador, Director of the National Nanotechnology Coordination Office.

Other countries are also active in this field. For example, the governments of Morocco, Nepal and Sri Lanka are funding basic research and supporting businesses in their efforts to expand nanotechnology applications in areas ranging from health and pharmaceuticals to food, environmental management, desalination and energy production.[25] The Government of the Netherlands provides major backing for NanoNextNL, an umbrella organisation that brings together over 100 companies, universities and businesses to research nanotechnology development.[26] The Netherlands is acting as a leader in research into the risks of nanotechnology, and seeks to ensure that the risk to humans and the environment is negligible or non-existent.[27] The European Union has also backed nanotechnology, making it one of the core components of their "Industrial Leadership" programme.[28]

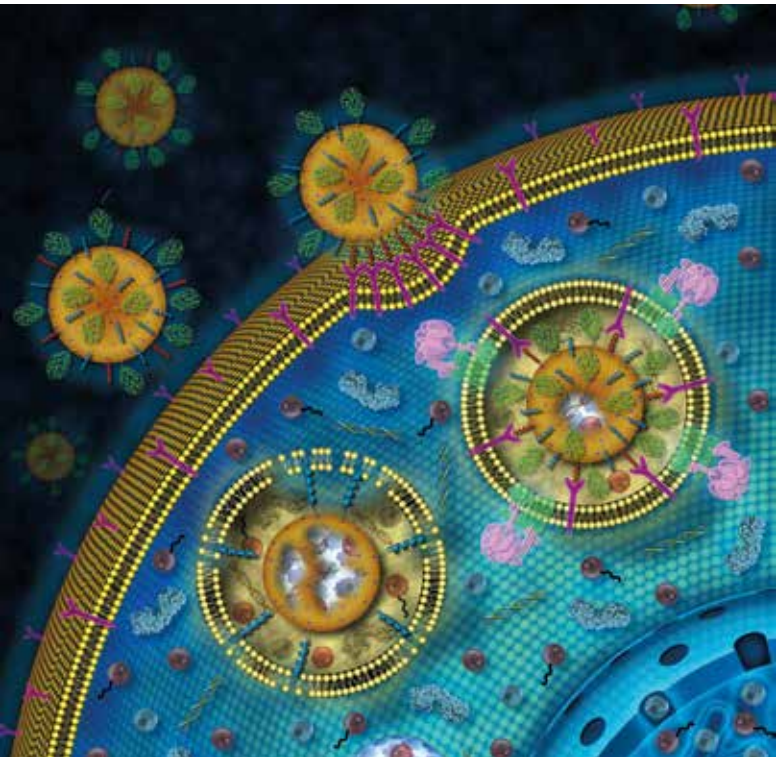
At the macro end of the spectrum, governments are looking at scale in new ways by aggregating sources and sensors to an extent unimagined only a few years ago. For example, as mentioned in Trend 1, governments are using satellite images provided by Orbital Insights to analyse massive numbers of photos providing contextual information about political and economic subjects that go beyond government statistics.[29] For example, analysts can gauge the amount of oil available in monitored tanks by detecting patterns in shadows, which change based on oil level. Such analysis can also been used to estimate trends such as the level of construction occurring in China, the extent of the grain harvest in the Russian Federation, and the number of cars parked at big-box retailers around the world. This innovation aims to use imagery to understand large-scale trends and synthesise this information for policy makers and decision makers.

Another key source of information that can be leveraged at the macro scale is people. The *Mapatón* case, described in the following case study, illustrates how cities can take advantage of the potential presented by massive amounts

22. See *www.whitehouse.gov/blog/2015/10/15/nanotechnology-inspired-grand-challenge-future-computing.*

23. See *www.nano.gov/sites/default/files/pub_resource/federal-vision-for-nanotech-inspired-future-computing-grand-challenge.pdf.*

24. See *www.nano.gov/node/1637.*



L Representation of nanoparticles entering a cell.

25. See *www.unesco.org/new/en/media-services/single-view/news/nanotechnology_is_a_growing_research_priority.*

26. See *www.nanonextnl.nl/about-us.*

27. See *www.government.nl/topics/nanotechnology/contents/nanotechnology-in-the-netherlands.*

28. See *http://ec.europa.eu/programmes/horizon2020/node/1306.*

29. See *https://rctom.hbs.org/submission/bean-counters-in-space-how-orbital-insights-sees-the-world.*

of data generated by citizens to provide a quick and cheap solution to a citywide problem. *Mapatón* uses a game to involve a wide range of citizens in mapping the bus routes of Mexico City, one of the world's largest megacities. Cities play a key role in scaling government because of the relevance of local-level initiatives to the daily interactions of citizens with public services. Innovations that similarly leverage people at scale may also be initiated in the private sector and used by governments for the good of communities. For example, as featured in the *Edge of Government* exhibit, a Japanese start-up launched the Pirika app to help cities address their litter problems. The app crowdsources pictures and videos of litter from a particular city and uses artificial intelligence to extrapolate heat maps to help city officials decide how to prioritise resources. Pirika now has over 40 000 individual users and over 300 corporate, government, and other organisational users, across 77 countries. Over 60 million pieces of litter have been picked up through Pirika.[30]

While these examples demonstrate the power of leveraging people at scale to inform government operations and decision making, such approaches can also be used to empower direct decision making by citizens concerning government use of taxpayer-supported resources. For example, Portugal is rolling out the world's first nationwide participatory budgeting initiative.[31] It will allow citizens to generate ideas for government spending, and then vote to determine which ideas are carried out. Citizens will be able to vote via the Web, SMS or the country's vast ATM network. The ATM option has the potential to drive massive voter turnout even in very rural parts of the country, and conveniently already functions as a secure means of proving identity. The government is currently conducting a large-scale outreach campaign to generate awareness of the upcoming votes.

"In every remote part of the country, you might have nothing else, but you have an ATM." [32]

Graça Fonseca, Assistant Secretary of State and of Administrative Modernisation.

Harnessing the power of people can also work at the national and global scale. This can be seen in new, innovative policies on Free and Open Source Software (FOSS), which are positioned to take hold in governments, as has been the case with open government data initiatives over the last few years. The White House Office of the Federal Chief Information Officer (OFCIO) recently launched an initiative called "The People's Code"[33] to unlock the tremendous potential of government software. FOSS has revolutionised the software ecosystem, and the emerging concept of releasing government code and the creation of a government-wide platform for access and public engagement has the potential to take it to a new level. Critically, the government encourages people to review the code to ensure that it is reliable and sufficiently effective to further national objectives, and even make contributions to improve functionality and add features. In turn, it encourages government employees to give back to the open source community through contributions to other projects. In December 2016, at the conclusion of the 2016 Open Government Partnership (OGP)[34] Global Summit, OGP released the "Paris Declaration",[35] to document commitments towards open and transparent governments. The Declaration includes a commitment from multiple countries and civil society organisations to promote FOSS, and a commitment to develop a FOSS policy template to help other countries, including guidelines and best practices for administrations to create and contribute to FOSS.

WHAT IS OPEN GOVERNMENT?

Open government is a culture of governance based on innovative and sustainable public policies and practices inspired by the principles of transparency, accountability and participation that fosters democracy and inclusive growth.

Source: OECD 2016b.

30. See *http://en.corp.pirika.org.*

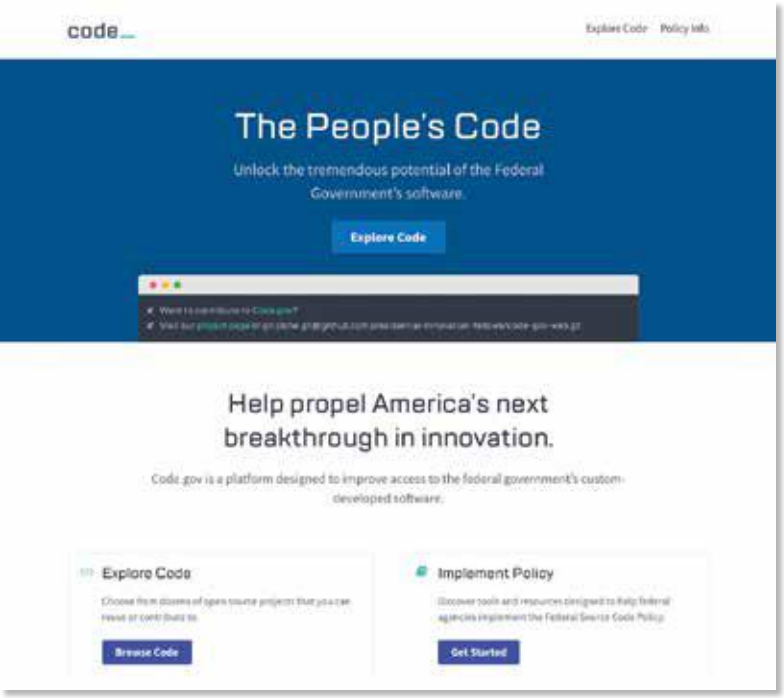
31. See *https://apolitical.co/portugal-world-first-participatory-budget.*

32. Ibid.

33. See *https://Code.gov.*

34. OGP is a multilateral initiative that aims to secure concrete commitments from governments to promote transparency, empower citizens, fight corruption and harness new technologies to strengthen governance. It was launched in 2011 and now has 75 participating countries. See *www.opengovpartnership.org* for more information.

35. *https://en.ogpsummit.org/paris-declaration.*



The People's Code on Code.gov.

The examples of *Mapatón*, Pirika and Portugal's participatory budgeting innovation constitute interesting applications of specialised approaches. The Code.gov example is somewhat different in that it relies heavily on existing and commonly used third-party services. In this case, GitHub – a hybrid code repository and social network – serve as the primary platform where citizens and civil servants can collaborate and participate in discussions. The use of existing services with associated infrastructure, such as social networks, can obviate the need for full custom development, which can save both time and money. Importantly, these networks already have large, robust communities that can be tapped to gain new insights and ideas from the data generated by users, as well as their direct comments and feedback. The purpose and returns of social media use by government offices are not always clearly identified, however, which can lead to uncertainty regarding how best to leverage social media for strategic objectives, including innovation and citizen engagement. It is, therefore, important to create effective measurement and benchmarking frameworks. Many countries are providing a structure for the use of social media tools by governments, as shown in Figure 2.2.

Figure 2.2: Central government social media strategies, internal use, and measurement

	Has a strategy or objectives?	Uses social media internally?	Uses metrics or indicators?
Australia	✓	✓	✓
Austria	✓	✓	✗
Belgium	✓	?	?
Canada	✓	✓	✓
Chile	✓	✗	✓
Czech Republic	✗	✗	✗
Denmark	✗	✗	✗
Estonia	✗	✓	✗
Finland	✓	✓	✗
France	✓	?	✓
Iceland	✗	✗	✗
Ireland	✓	✗	✗
Italy	✓	✓	?
Japan	✗	✗	✗
Korea	✓	✓	✗
Mexico	✓	✓	✓
Netherlands	✓	✓	?
New Zealand	✗	✓	?
Norway	✗	✗	✗
Poland	✗	✓	?
Portugal	✗	?	✗
Slovenia	✗	✓	✗
Spain	✗	✗	✗
Sweden	✗	✗	✗
Switzerland	✗	✗	✗
Turkey	✓	✗	✗
OECD	**13 (50%)**	**12 (46%)**	**5 (19%)**
Colombia	✓	✓	✓

Source: Mickoleit, A. (2014), "Social Media Use by Governments: A Policy Primer to Discuss Trends, Identify Policy Opportunities and Guide Decision Makers", *OECD Working Papers on Public Governance, No. 26*, OECD, http://dx.doi.org/10.1787/5jxrcmghmk0s-en

Note: "✓" means "Yes", "✗" means "No", "?" means "Don't know". Italy and Mexico information is for 2015.

Challenges

Bureaucratic barriers can raise significant hurdles. These minimise the possibility of scaling innovation beyond its birthplace, which can result in inconsistent pockets of innovation.

Difficulty in bringing people together. Cultural mismatch between innovation teams and other civil servants may result in friction. A reluctance to partner with external organisations and business, which in some cases is a must for innovation to occur, may provoke similar difficulties. An additional factor in this regard is rules or an organisational culture that discourage engagement with the public.

Contributing factors

Freedom to experiment. Civil servants that feel empowered to experiment – the essence of the first stage of scaling (starting small) – are more able to apply lessons and pursue innovations. This suggests that governments that give public sector employees the space and freedom to take risks will be more able to promote innovation. This includes ensuring that governments provide support and incentives to innovate, and foster a culture where civil servants roll out new projects in an agile and iterative manner, and scale once they have demonstrated value.

Strong partnerships. Countries that are redefining the meaning of scale to see and leverage innovation in ways previously beyond their conception are also strengthening their capacity to build partnerships with those equipped with specialised expertise in emerging methods, both across government and with external parties. Governments often encompass complementary functions spread throughout departments and organisations. The partnering of these entities allows innovation to flourish. Moreover, governments most effective at innovating in this area recognise that they may lack the necessary knowledge and skills, and that engaging with those that do increases the capacity to innovative and the chances of success.

Trust-based relationships. Trust among key government partners and with the public is a key component of successful innovation. Lack of trust among programme staff regarding the intentions of innovation teams will make it difficult to institutionalise innovative techniques and skills more broadly within the culture of government. In addition, lack of trust will limit the abilities of teams to initiate or implement projects over the long term, and may provoke others to actively block their efforts. Trust is also needed among external partners to ensure all participants involved collaborate in good faith towards common goals. Finally, securing public participation in this area, as well as confidence that the government will only use the information provided in a positive manner, is necessary in order for innovations such as *Mapatón* to work (see the following case study). Citizens who distrust their government will react negatively if asked to install an app on their phone that tracks their location.

Recommendations

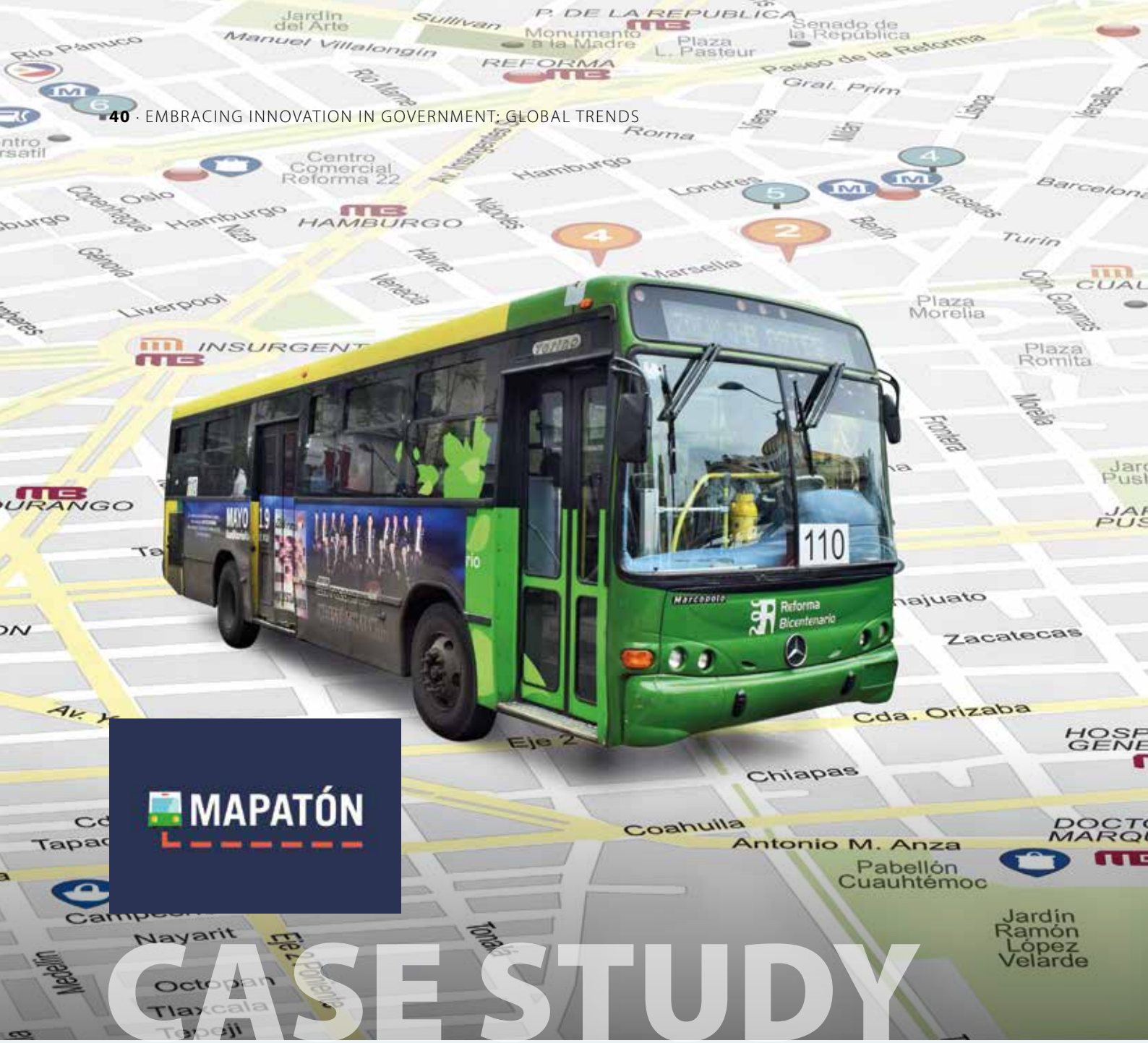
Policy makers' efforts to identify initiatives aimed at enhancing service delivery through innovative methods should be supported. To do this, we recommend governments:

1. **Provide a common ground for collaboration.**
   Tools that facilitate collaboration within individual organisations, across government and with the public, can improve government-wide and societal results. Approaches such as common platforms that enable people to connect at a central location can impact the ability of organisations to join forces in the development of innovative solutions to common problems and to scale innovation (Daglio et al., 2014). Governments do not necessarily need to create new platforms, as many third-party solutions exist. The creation and promotion of these platforms signals the importance of collaboration and innovation, and helps to animate political expressions that support innovation.

2. **Build shared approaches to encourage innovation.**
   Joint implementation frameworks help manage public expectations and create a more homogenous approach to public sector innovation. They can help achieve a common understanding of innovative goals and can exist across many organisations in one level of government, multiple levels of government and even with external groups seeking similar ends. This may involve structuring and co-ordinating efforts to share good practices and experiences between the different actors (OECD, 2016b).

3. **Be a willing and responsive partner.**
   Governments must actively seek out partnerships with organisations, universities, companies and citizens in order to scale programmes in ways that meet user needs and bring new perspectives into government. It is equally important to act on what is learned in a visible manner, to help ensure the value of collaboration is clear and that partners will want to maintain the practice.

4. **Build trust through transparency.**
   The topics in this trend could be perceived as perhaps the most controversial in terms of threats to perceived territories (scaling new practices), as well as privacy (harnessing citizen information at scale). The only democratic way to continue down this path of innovation is to do so in a transparent way, so public employees and the public understand the intent, process and results of the innovation, and are comfortable and even supportive.



Mapatón – Mexico City, Mexico

SUMMARY

Mapatón[36] is an innovative crowdsourcing and gamification experiment in Mexico City to map the city's bus routes through civic collaboration and technology. Prior to the experiment, there was a complete lack of comprehensive information – including maps – on the thousands of bus routes in Mexico City. City leaders set out to solve this problem by designing a citywide game that residents could play while travelling by bus. During play, the game relayed critical information such as GPS coordinates to the city. In a matter of weeks, the game provided sufficient data to map the routes, as well as information on variables such as length of journey, passage frequency, duration and fares.

36. See www.mapatoncd.mx.

THE PROBLEM

Mexico City has one of the largest public bus systems in the world. Because of its size and complexity, as well as its largely informal spirit, Mexico City has not been able to develop data or maps for this mode of transport, which is used by 70% of the population and accommodates 30 000 public buses that provide 14 million individual rides per day. Until this point, no data-driven policy has been possible, and citizens have had to rely on word-of-mouth to work out how to get from point A to point B. To address these issues and better serve citizens, Mexico City devised an innovative plan to map bus systems.

Crowdsourced mapping

AN INNOVATIVE SOLUTION

Processes for the generation of mobility data are time-consuming and expensive. To address this problem, Mexico City decided that the best option was to allow passengers to generate the data themselves. In 2013, the *Laboratorio para la Ciudad* ("Laboratory for the City") – the experimental arm and creative think tank of the Mexico City government, reporting to the Mayor – organised a multi-stakeholder collaboration (OECD, 2016). In partnership with 12 organisations including NGOs, the private sector and other government offices, they created a year-long working group (OECD, 2016). Its objective was to improve urban mobility and transport in Mexico City through the development of the crowdsourcing initiative *Mapatón*. In 2016, more than 4 000 public transport users participated in the citywide game, gathering data with the aim of creating an open database on the 1 500 plus bus routes in the city. These participants earned points for their efforts, which they could exchange for prizes and rewards (MegaCities-ShortDocs, 2016). During the closing event and awards ceremony of *Mapatón*, the working group provided the generated open source database to the Head of Government, the Secretary of Mobility of the City and the public. A few weeks later, PIDES, a local NGO, hosted a three-day hackathon to create useful resources from the data generated by *Mapatón*, with the participation of ten mentors specialising in programming, geography and design, among others.

Mapatón players photographing a bus for the game.

Hackathon participants.

NOVELTY

A citywide game had never before been used to create open data for such a huge transportation system.

IMPACT AND RESULTS

Over 4 000 mappers produced data on the more than 1 500 bus routes in the city, covering almost 50 000 kilometres. This is 10 000 kilometres greater than the circumference of the Earth. This impressive feat was accomplished with a budget of less than USD 15 000 in just two weeks. A traditional large-scale mapping effort could have cost millions (MegaCities-ShortDocs, 2016).

The Ministry of Mobility, as well as key foundations, are now helping to clean the data and are using them for data-driven policy and research. The data were also opened up to the public for use by companies and civic hackers to develop smartphone apps for several transport modes and routes to help riders get from place to place.

REPLICABILITY

Mexico City is working to create an open platform for other cities that want to replicate *Mapatón*. At least six international cities have already expressed interest.

Mapatón players mapping a bus stop.

CHALLENGES AND LESSONS LEARNED

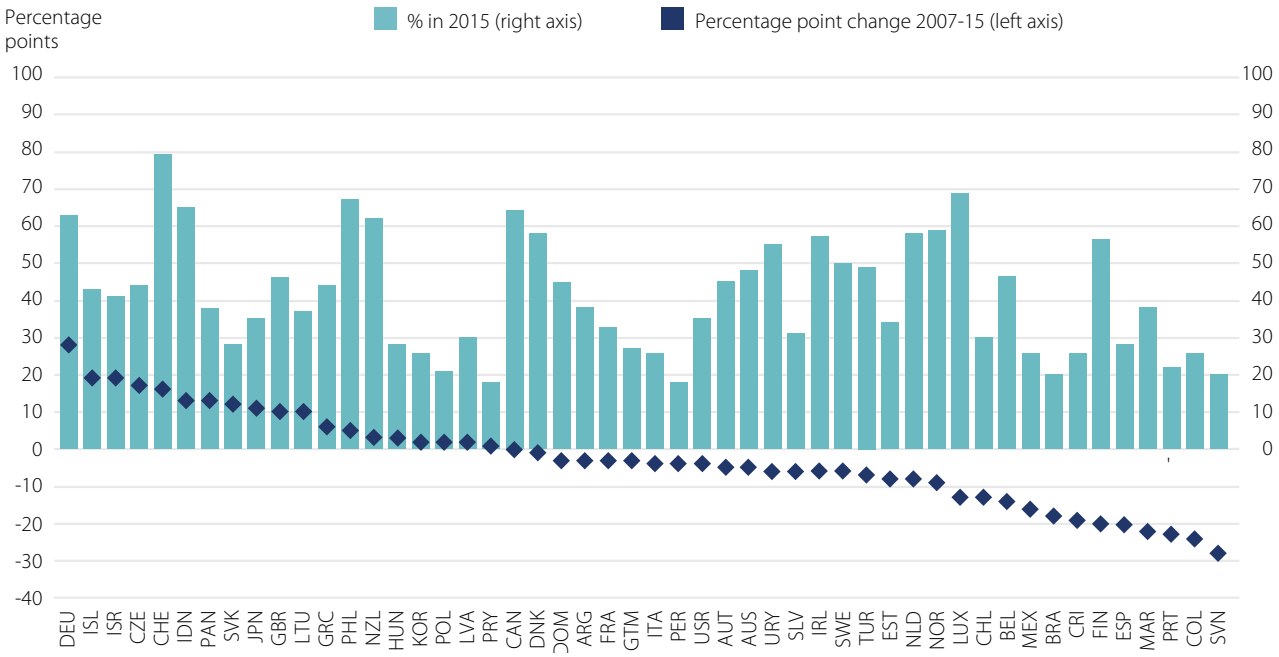
Despite conducting four pilot studies, several technical challenges had to be overcome in the course of the project, such as the quality of the produced data. A particular problem arose when on two occasions, different users attempted to hack the system by adding ghost routes and points. They were quickly blocked (Pides Innovación, 2016). This highlights the importance of involving experts and the capacity to react quickly to make adjustments to the software, as necessary. Another set of challenges concerned the involvement of participants, without whom no data would have been generated. Creating incentives for participation in the form of the gaming element and the chance to win prizes, as well as communicating the importance of participation through storytelling, proved essential.

Hackathon participants and winners.

Trend 3
Citizens as experts: redefining citizen-government boundaries

In addition to expanding the technological boundaries of public sector innovation, as discussed in Trend 1, governments are also redefining the boundaries between themselves and their citizens in important ways. Broadly speaking, those innovations that expand and redefine the relationship between the government and citizens help to provide more inclusive, transparent and accountable government, which can further amplify the power of innovation. Innovative governments are enhancing citizen engagement and ensuring public involvement at every stage of the policy cycle: from shaping ideas to designing, delivering and monitoring public services. Ultimately, the goal is not merely to improve the type and quality of services that governments provide, although those are important considerations, but also to transform the culture of government so that citizens are seen as partners who can shape and inform policy and services. Ultimately, this can enhance citizens' confidence in government, which is generally low, and is decreasing in many countries.

Figure 3.1: Confidence in national governments in selected countries



Note: Data refer to the percentage of respondents who answered "yes" to the question, "Do you have confidence in national government?" Data for Austria, Finland, Ireland, Norway, Portugal, Slovak Republic, Slovenia and Switzerland are 2006 rather than 2007. Data for Iceland and Luxembourg are 2008 rather than 2007. Data for Morocco are 2011 rather than 2007. Data for Tunisia are not provided.

Source: Gallup World Poll (n.d.), "Gallup World Poll", www.gallup.com/services/170945/worldpoll.aspx.

GOVERNMENTS ARE PURSUING MULTIPLE APPROACHES TO INVOLVING CITIZENS IN PROMOTING INNOVATION

Governments around the world are pursuing a wide range of approaches in order to build their relationship with citizens. In an effort to promote reforms to redefine citizen-government boundaries, the OECD, together with its member countries, has identified key principles and good practices for citizen engagement that can guide countries' efforts to involve citizens in the design of government actions and the provision of services. This work is founded on the belief that governments must engage with their population as *partners* in the design, delivery and evaluation of policies and services, in order to benefit fully from these interactions (OECD, 2016a).

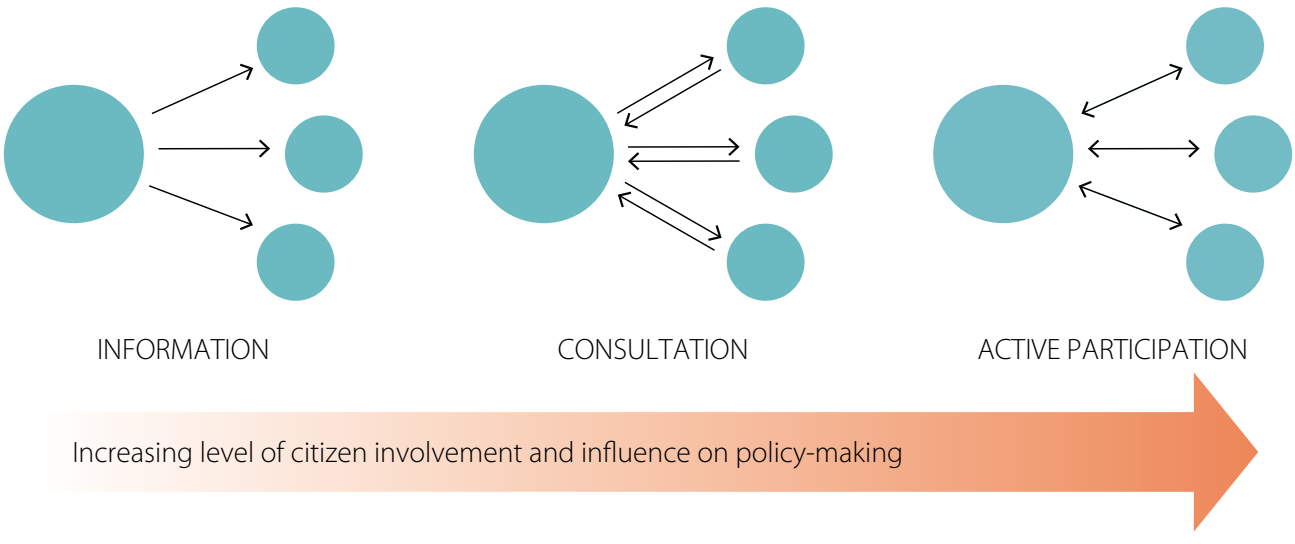
The OECD therefore defines the relationships between citizens and public administrations in terms of increasing levels of engagement (see Figure 3.2). At one end of the engagement spectrum is information provision, whereby governments produce and deliver information for use by citizens, such as allowing access to public records and enhancing government websites. Consultation is the mid-point of the spectrum and consists of a two-way relationship in which citizens provide feedback to government through avenues such as public opinion surveys and comments on draft legislation.

The most innovative governments, however, develop an active and participatory relationship based on partnership with the government. At this end of the spectrum, citizens engage in the process of policy making and service delivery. Active participation acknowledges equal standing for citizens in setting the agenda, proposing policy options and shaping the dialogue through, for example, consensus conferences and citizen juries (OECD, 2016a). It recognises that the best ideas may not come from within government and that governments can learn from the diverse perspectives of their people.

Public consultation and engagement enable governments to access new ideas and feedback from citizens, which enhance the quality of policies and services, and may even lead to new ones not previously considered. In general, governments that use a combination of information, consultation and active participation initiatives to engage with citizens can produce positive effects on the quality of their democracy (OECD, 2016a).

Some governments adopt an even more expansive conceptualisation of citizen engagement referred to as the "co-production" of policies and services. These collaborative approaches allow citizens to engage in partnerships with service professionals in the design and delivery of a public service. By allowing for greater public

Figure 3.2: Information, consultation and active participation



Source: OECD (2016b).

involvement and engagement, these activities result in profound changes in the relationship between citizens and their governments (OECD, 2011). The trends in this section explore how countries at the edge of innovation are mastering such forms of active participation.

It is important to note, however, that some forms of participation are citizen-initiated without government intervention. This can have both positive and negative effects for government, but in general, can increase overall trust among citizens and, in some cases, improve justice. For example, the *Edge of Government* features an exhibit on DoNotPay[37], an online service launched by a teenager with what is referred to as the "world's first robot lawyer" . Backed by artificial intelligence and programmed with a sophisticated working knowledge of the legal code, DoNotPay's chatbot lawyer has overturned 160 000 parking tickets – representing USD 4 million – in London and New York City (Gibbs, 2016). This has the benefit of saving citizens money, but also increases the administrative burden for governments, which have to process appeals, and – if the appeal is successful – reduces the money in city's coffers. However, the benefits to justice cannot be overlooked, as a significant number of the tickets appear to have been issued in error. DoNotPay is also working to scale the chatbot functionality to fight housing evictions and help those diagnosed with HIV to understand their rights.[38]

GOVERNMENTS ARE RENEGOTIATING WHAT IT MEANS TO BE AN EXPERT THROUGH ACTIVE PARTICIPATION AND CO-CREATION OF POLICIES AND SERVICES BY THEIR PEOPLE

Innovative governments are realising that citizens are a critical component to designing and creating public policies and services. This realisation is due in part to the need to ensure citizen buy-in by including them in the process. Governments are also recognising that citizens are more than mere recipients of services, as in many cases, their expertise improves the design and delivery of services by making them more efficient and effective, and better attuned to real needs.

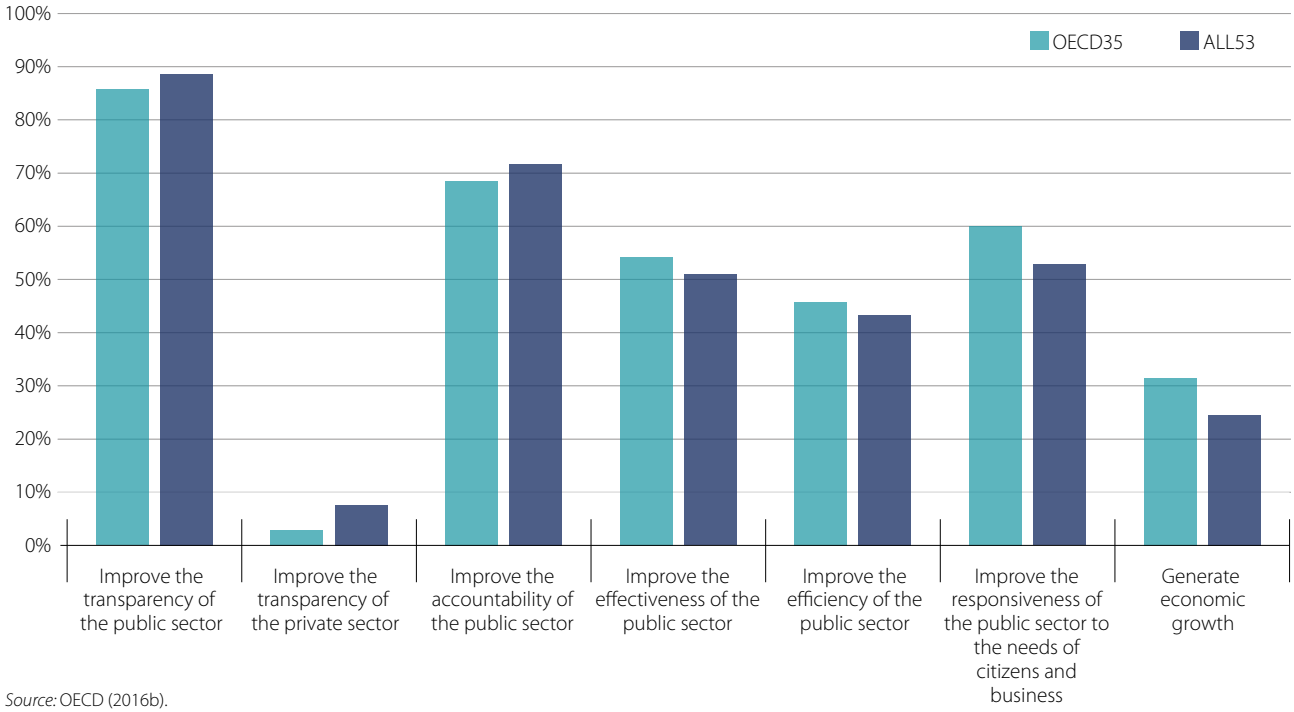
One example of the potential gains of harnessing citizen expertise is the Good Judgement Project from the United States. Sponsored by the Department of Defence, this project created a forecasting tournament in which five teams competed to generate accurate forecasts of political and economic events. The objective was to improve the government's ability to anticipate global events. The teams consisted of volunteers who responded to public advertisements, with no specific requirements specified regarding participation (Tetlock and Gardner, 2016). These amateurs "managed to set the performance bar so high that even the professionals have struggled to get over it, let alone clear it" (Tetlock and Gardner, 2016). Comparison of project forecasts to actual events over a few years enabled the government to identify the components necessary to develop accurate forecasts. This example helps to illustrate the cognitive power of a group of otherwise disconnected and regular citizens, and demonstrates the essential role that the public can play in designing, shaping and analysing public policies and issues.

While governments value the benefits of transparency that can be brought by increasing openness, not all governments yet appreciate the impact that improved two-way dialogue can achieve. As identified in the 2015 OECD Open Government Survey, countries have a wide range of objectives in implementing open government activities (see Figure 3.3). The results of the survey show that 86% of OECD countries (and 89% of all 53 countries that responded to the survey) prioritise transparency as a goal of their open government activities. However, improving the responsiveness of government to the needs of citizens and businesses came in much lower, demonstrating the need for additional emphasis in this area for countries looking to match the efforts of more innovative governments. As countries look to move the boundaries of citizen-government relationships, innovations that expand open approaches in ways that increase responsiveness and improve effectiveness will be critical.

37.See www.donotpay.co.uk.

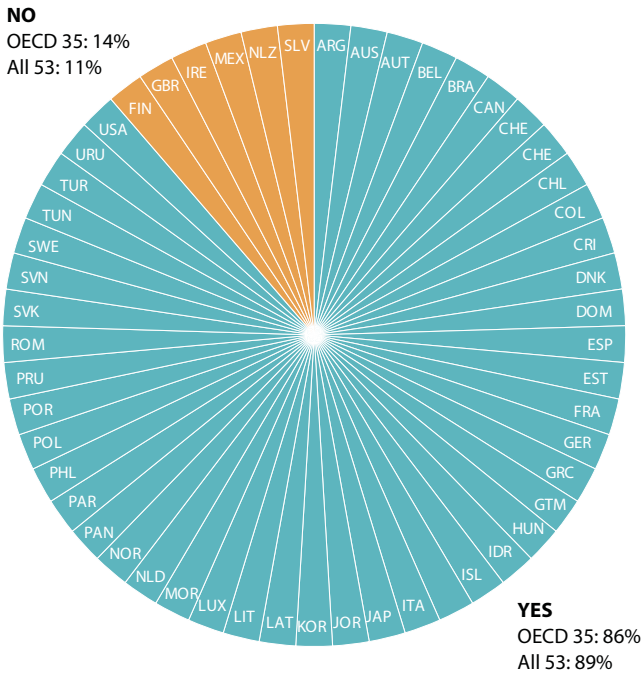
38. See www.theguardian.com/technology/2016/jun/28/chatbot-ai-lawyer-donotpay-parking-tickets-london-new-york.

Figure 3.3: Objectives of countries' open government strategies



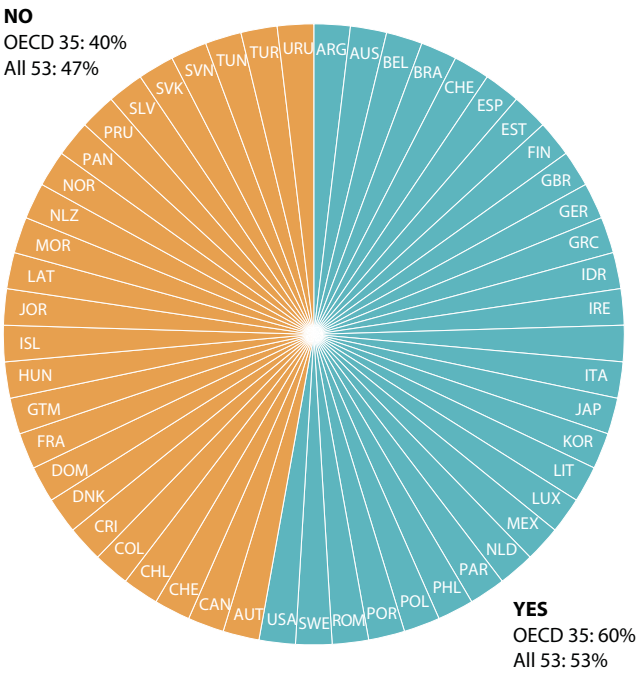
Source: OECD (2016b).

Figure 3.4: Countries that prioritise transparency as a goal



Source: OECD (2016b).

Figure 3.5: Countries that prioritise responsiveness as a goal

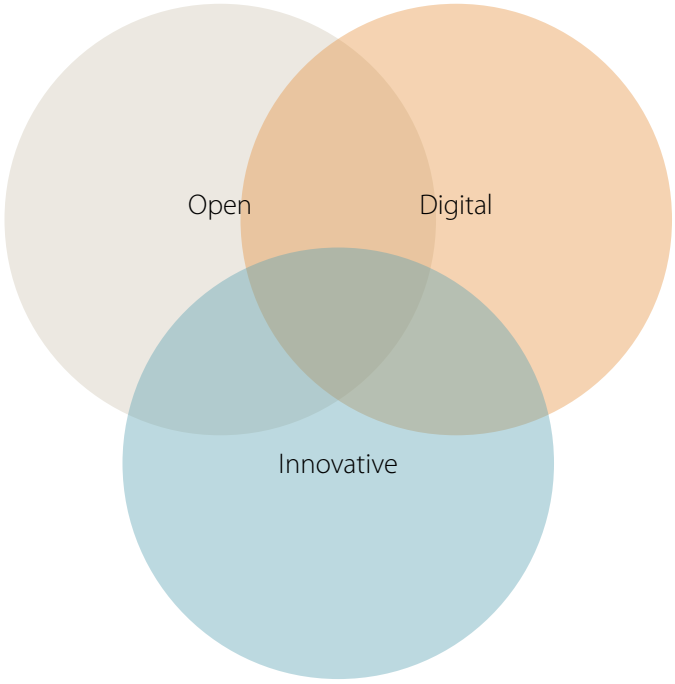


Source: OECD (2016b).

GOVERNMENTS ARE LINKING CITIZEN ENGAGEMENT TO OTHER KEY INITIATIVES

The most innovative governments are also looking at how citizen engagement can support other public sector reform trends. For example, different government agencies or offices are often responsible for managing "open government", "digital government" and "public sector innovation". In these silos, openness is often viewed solely in terms of information provision, while innovation is discussed in terms of new ways of providing services, and digital government is perceived through the lens of data portals. Yet, these policies can all help promote citizen engagement in ways that expand the boundaries of government and citizen interaction, and in fact, the combination of all three can provide a perfect storm for transformation. The intersection of multiple initiatives is where the edge of government lies (Figure 3.6).

Figure 3.6: Intersection of open, digital and innovation policies



For example, the overlap between *open* and *innovative* policies could include Agents of Open Government (discussed in the following case study and featured in the *Edge of Government* exhibit), which does not necessarily rely on technology but rather involves citizens in new approaches to crafting services. Furthermore, the intersection of *digital* and *innovative* activities could include new ways of consolidating or disseminating previously published data. One such example is Indonesia's National Citizen Feedback Dashboard, which visualises citizens' feedback and enables public officials to prioritise trending issues based on enhanced data analysis. The tool uses data from LAPOR! – an online platform where citizens can file complaints through a web form, SMS or social media – combined with passive feedback from Twitter, and creates visualisations of trends. It can serve as an early alert system that draws attention to surges in complaints on a particular trend or within a geographic area.

Each of these intersections can result in innovation; however, the intersection of all three areas is where boundaries really expand to provide new approaches to building the relationship between citizens and the government. Beyond providing more responsive and effective services, this intersection has the potential to connect citizens to policy making and service delivery, and thereby enable their feedback to directly affect policy formation. By design, these tools are changing citizens from passive users of services into actors that can impact the quality of services and even the design of policies and service delivery, through the provision of on-the-ground knowledge. For example, as discussed in Trend 2 and featured in the *Edge of Government* exhibit, Portugal is pursuing participatory budgeting at the national level, with citizens able to vote through the web, SMS or the country's vast ATM network. In addition, Finland is launching an online platform to crowdsource and crowdfund citizen-driven innovation and experimentation, and to allow for the open exchange of ideas, as discussed in the Place to Experiment case study at the end of this trend.

Challenges

Governments face a number of challenges in their efforts to redefine citizen-government boundaries. These can be categorised in terms of three main types:

A belief that transparency is enough. This is not the case. As noted in the OECD open government survey data discussed above, the near-universal focus on transparency is encouraging, although it suggests that many governments have yet to see citizens as full partners in promoting more effective and efficient public services.

Structural resistance can hinder engagement. This resistance can include entrenched bureaucracy and a culture of entitlement among officials or patronage networks. Where these hurdles exist, civil society organisations and innovative or pro-reform government officials can play a role in challenging such inertia (Antlöv and Wetterberg, 2011).

Coping with facilitating, absorbing and responding to input. Involving all citizens as active partners in government is something governments are learning how to do as they go. Even where governments see citizens as partners, they face the technical challenge of identifying the best methods to gather and incorporate this public expertise. They must also take on the difficult task of evaluating these inputs and determining the extent to which the expertise should be used to shape policy or services. Finally, governments face challenges in responding to citizens' concerns regarding how their inputs are or are not being acknowledged, so as to avoid alienating them.

Contributing factors

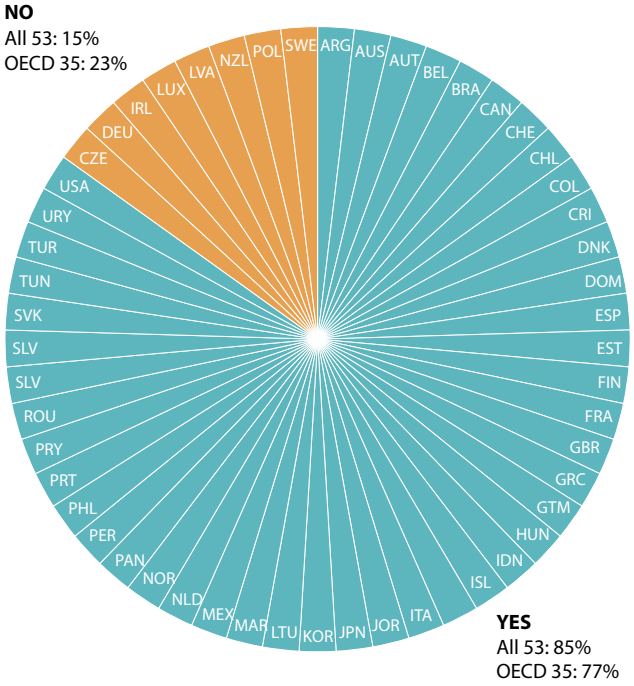
OECD research has found that the three most commonly cited factors for successful activities in this area are:

Top-level commitment and leadership. Willingness and capacity at all levels to engage with the public is critical. Leaders at the top have the power to set a strategic direction that can ripple through each level below. This level of commitment can make or break citizen partnerships by framing the culture of government at large (OECD, 2016a). This encourages public employees to look beyond the walls of their organisations and government, and accept new ideas and feedback.

Established criteria and processes. Although initial efforts are often ad-hoc, governments that systematically achieve success over the long term generally follow certain criteria in their citizen engagement activities to help ensure consistency and avoid confusing the public with inconsistent or even contradictory messages or practices. OECD data suggest that governments need to continue to focus on improving the quality of citizen engagement, for example, by providing a clear process and timelines, advance notice, and awareness raising and feedback mechanisms, in addition to increasing the quantity of opportunities. This helps to foster trust in the fairness and reliability of the process and in the way citizens' voices are heard. Most countries that responded to OECD's (2016b) Open Government survey indicated that they have established a dedicated office for horizontal co-ordination for open government activities, which is highly encouraging, as it suggests that countries have the organisational infrastructure in place to link initiatives and establish consistent criteria and processes (see Figure 3.7). However, they have not generally developed an over-arching process focusing on involving citizens in the policy cycle (see Figure 3.8).

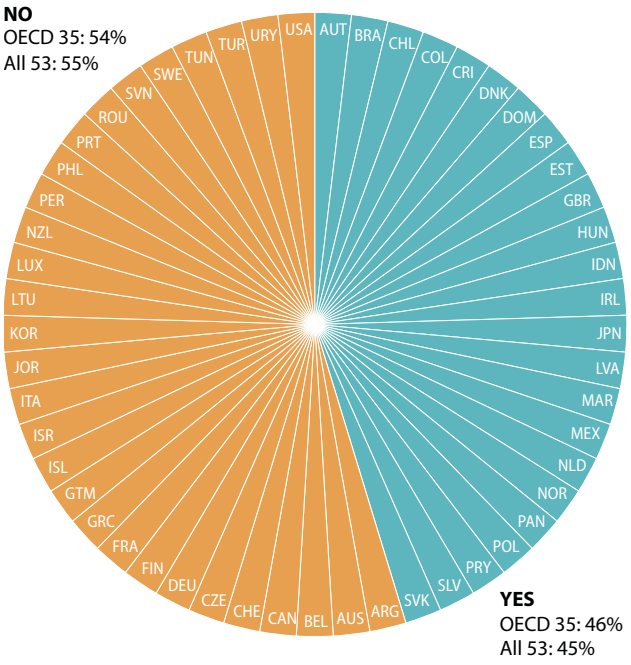
Ability to show benefits. Ultimately, many successful innovations that seek to expand the boundaries between citizen and government relationships promote operational or social benefits, such as more efficient use of public resources and improved service delivery and citizen wellbeing. The ability to demonstrate these impacts at a high level, and tell stories about them at an individual level, encourages civil servants and citizens to work together.

Figure 3.7: Existence of a dedicated office for horizontal co-ordination of open government initiatives



Source: OECD (2016b).

Figure 3.8: Availability of an overarching document focusing on citizen participation in the policy cycle



Source: OECD (2016b).

Recommendations

Engaging with citizens is one of the most critical steps to innovating government policies and services. To maximize the potential for innovation through citizen engagement, we recommend governments:

1. **Develop government-wide engagement strategies.**
   Governments should develop a strategy with clear objectives to promote open government and citizen engagement, and to show that they are government priorities.[39] This would help ensure that processes for citizen engagement are replicated throughout the public sector in a consistent way that will promote trust among citizens. Public officials from central and local institutions, as well as key actors from civil society and the private sector, should be involved throughout the entire process to ensure a comprehensive approach and buy-in (OECD, 2016b). This strategy should include considerations for building up the capacity of public employees to interact with and hold citizen-centred conversations with the public, and for interpreting and acting on what they learn.

2. **Arm public employees and citizens with tools to connect and establish dialogue.**
   Government leaders cannot simply tell civil servants and citizens to talk to one other. They must also provide tools to allow this two-way dialogue to take place. These tools can include technological solutions forasynchronous electronic discussions. For example, the United States uses the GitHub platform to interact with citizens to continuously improve implementation of its Open Data and Source Code policies on Data.gov and Code.gov, respectively (Trend 4 includes additional discussion on Code.gov). They can also include dialogue tools to assist with in-person discussions. Simply providing physical space to bring people together for conversations can also help.

3. **Build evaluation into the innovation process.**
   Governments should consider the need to evaluate innovation projects during their design. This includes identifying specific monitoring and evaluation activities and tools that translate into easily analysed information that will support the expansion of innovation by showing benefits.

4. **Take feedback into account and reconnect with citizens.**
   Finally, governments must endeavour to build formal mechanisms to ensure that feedback from citizens is considered and acted on, as appropriate, and that citizens are made aware of how the feedback was acted upon. Credibility and trust are diminished if governments are perceived to be listening only to appear inclusive of citizen views.

39. The OECD (2009) Principles for Open and Inclusive Policy Making provide guidance for countries in designing and implementing an effective framework for citizen engagement, including co-ordinating engagement initiatives across government to avoid consultation fatigue and creating a coherent approach. The principles also stress the role of accountability, including efforts to report back to citizens regarding the impact of their input (OECD, 2016a).

CASE STUDY

Agents of Open Government – São Paulo, Brazil

SUMMARY

Agents of Open Government – part of a wider city initiative entitled "São Paulo Aberta" (Open São Paulo) – aims to provide a platform for peer-to-peer learning, where private citizens with useful skills are given support to develop courses for government employees, civil society groups and communities in all corners of São Paulo. This initiative reflects a growing global trend toward recognising that institutions can become smarter – more effective and efficient – by making use of the skills and experience of those outside of government.

THE PROBLEM

São Paulo has a wealth of knowledge and skills that could and should be incorporated by government and shared more broadly throughout the city. However, until now the city has had no systematic approach to sharing knowledge. Furthermore, courses on many issues, such as open source software, social media communications and mapping technologies, were rarely available outside the city centre or only at a prohibitive cost, rendering them inaccessible for many people.

AN INNOVATIVE SOLUTION

The Agents of Open Government programme created by the city of São Paulo addresses these issues by identifying citizens that have skills they are willing to teach. Utilising the city's range of infrastructure, they are able to bring courses to the communities where they can be accessed at no cost. The participation of public employees as students in these courses has the additional effect of inverting government. Instead of being told what to do by the city, citizens are given an opportunity to design courses that can bring new skills and understanding to public employees, resulting in improved and better services offered by the city.

The programme began with an open call for applications, which was disseminated and promoted through existing civil society networks, social media and via presentations at local community events. Any resident of the city with the desire and requisite skills to teach a particular subject was welcome to apply, with the understanding that they would be required to offer their course for 10 hours per month for 6 months, in exchange for a monthly stipend of BRL 1 000 (approximately EUR 270). The initial call received 200 applications. Twenty-four agents were chosen for the initial cycle and 24 in the second cycle in 2016. Courses are grouped into the follow categories: open and collaborative technology, transparency and open data, networked communication, and mapping and collaborative management. Over 2016, 1 200 different workshops were held.

The programme was made possible by a number of partnerships with key institutions. The Municipal School of Public Administration, which is the main provider and coordinator of training for public employees at the local level, agreed to provide credits to municipal employees who take courses from the agents. These credits can accumulate towards eventual promotions. In addition, the school works in collaboration with a number of agents to develop courses directed specifically at municipal employees, and promotes these courses through the school's network.

Another important partnership has been developed with the Municipal Department of Social Assistance and Development, which provides a range of social protection services for São Paulo's most disadvantaged citizens. This partnership has brought the work of agents to both the beneficiaries of the department's services, as well as the employees and educators who deliver them. For example, the OECD attended a course for educators on the use of digital animation techniques that can be incorporated into programmes with disadvantaged youth. In both cases, these partnerships provide opportunities to align the programme with city priorities and mainstream employee development needs.

NOVELTY

São Paulo is one of a few cities to be active in the Open Government Partnership (OGP). São Paulo Aberta (Open São Paulo) includes a range of initiatives related to transparency, accountability, civic participation and innovation, which have the ultimate goal of developing democracy in the city and changing the organisational culture of government. It became apparent to the open government team that traditional approaches to learning and development, both for citizens and public employees, did not meet the demands of these new challenges. Instead, they conceived a common platform that could meet these goals, while bringing citizens and public employees together to build and define a new relationship.

IMPACT AND RESULTS

The workshops and courses taught by the agents have been well attended and well evaluated by participants. From November 2015 through to the end of 2016, over 15 000 people attended courses and workshops made available through the programme. Over 90% of participants rated their experience as good or great with regard to information availability, quality of the agent's knowledge and teaching skills, and applicability of the subject. Agents

Agents of Open Government course.

meet together on a monthly basis to review evaluations and conduct peer reviews of each other's work, with a view to constantly improving their courses and their teaching skills.

Interviews and discussions with agents revealed many learning-related stories concerning the identification of problems and possible solutions. For example, one agent worked with educators on issues related to adolescent women. Together, they started a blog to share stories, thereby improving their collective understanding of the challenges young women face in these communities. Others discussed ideas for creating simple apps that could benefit their community. The mapping workshop showed public employees how to take advantage of a range of free and open source software to map community services, making significant savings on the use of proprietary versions.

REPLICABILITY

The issues that this programme addresses are not confined to São Paulo or Brazil, but exist in all large urban areas. Such areas are also home to citizens and civil society organisations that are able and willing to share their knowledge and skills for the collective improvement of the urban environment. This approach therefore has a high replicability quotient, as there is little need for complex infrastructure or a high level of investment. What is required is space across the city in the form of schools, community centres and other environments that can be used as training centres. Some courses will require access to Internet connections and computers. The programme also relies on a network of active citizens and members of civil society, and a strong relationship between these actors and the city. Finally, a committed core team is needed to coordinate the programme.

CHALLENGES AND LESSONS LEARNED

Feedback from participants greatly improved between the first and second cycles of the programme, which shows that officials are making efforts to iteratively enhance the programme. This is the result of regular meetings with all agents and the use of peer reviews and other processes to refine teaching skills and improve workshops. Many agents discussed the importance of building connections with local community leaders, obtaining their input for the design of courses, and using these networks to build awareness and increase attendance. These elements not only enable the programme to provide opportunities for sharing knowledge, but also present an opportunity to reinforce bonds between the city and civil society. Other agents spoke of the importance of open and transparent calls for workshops, and the need to invest in a good communications campaign to encourage people with useful project ideas to apply.

CASE STUDY

Place to Experiment – Finland

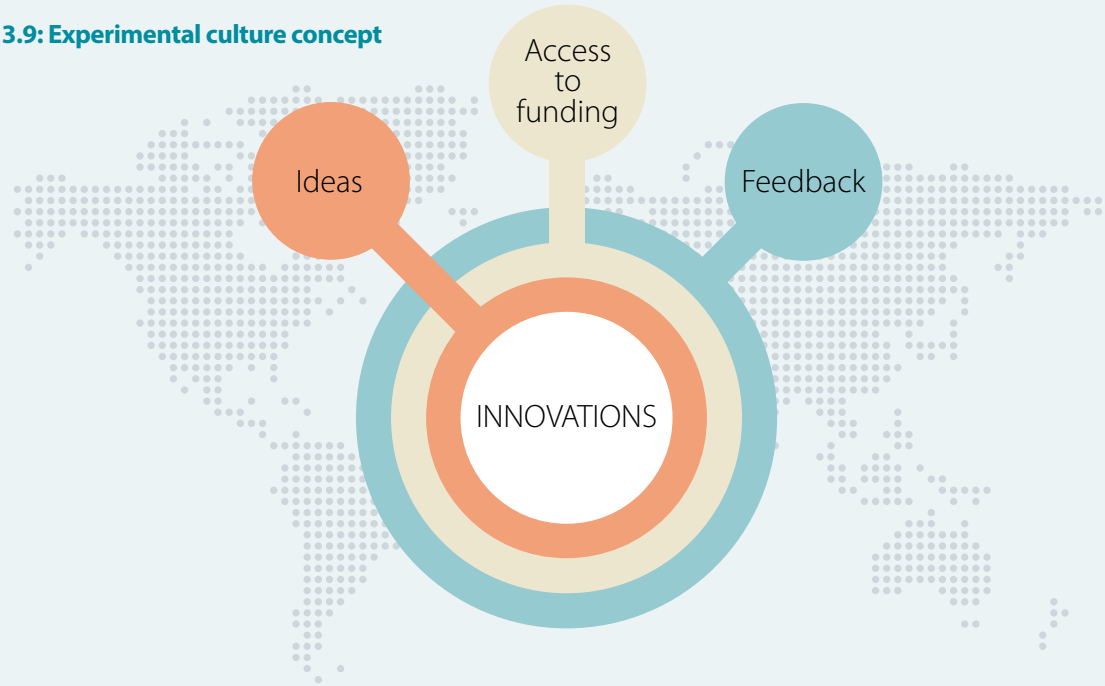
SUMMARY

Finland is launching a digital platform entitled *Kokeilun Paikka*[40] (Place to Experiment) to support the government's key goal of supporting an experimental culture to find innovative ways to develop public services. Through the creation of a digital tool to support this ambitious goal, the government of Finland aims to provide a platform to market innovations; collect feedback, advice, and funding sources for innovators; and connect reformers with government and vice versa. Ultimately, the goal is to shift the method of developing services from a top-down dictated process to a more co-created – in some cases even crowdsourced or crowdfunded – process for public sector innovation, and in this way help to redefine citizen-government boundaries in the country. The government views an experimental culture as a two-way street that takes grassroots innovations and provides an avenue for acceleration through capacity building and by linking innovators with reformers and sources of funding. At the same time, this culture enables countries to divide complicated issues into smaller component parts.

Although still in its early phases, the aim of the digital platform is to highlight innovative solutions and improvements in services, promote individual initiatives and make use of citizen-driven operating practices. More broadly, the goals are to improve Finland's capacity to solve social problems, public trust and transparency, citizen engagement, and the efficiency, effectiveness and quality of policies and services.

40. See *www.kokeilunpaikka.fi.*

Figure 3.9: Experimental culture concept



THE PROBLEM

The government has identified key obstacles to spreading innovation and improving the relationship between the government and citizens. These obstacles include a lack of flexible financing and connections among innovators, and an absence of information about viable solutions and innovative approaches. Furthermore, experimentation at the grassroots and local level is very common in Finland, but there is a lack of a central overview of the experiments being conducted. Learning is thus often coincidental and ad-hoc.

AN INNOVATIVE SOLUTION

The Finnish government believes that experiments are a reliable and efficient means to gain concrete evidence on how legislative, organisational structures and operational models should be developed. In collaboration with the non-governmental organisation Demos Helsinki (which also created the Design for Government national experimentation framework discussed in Trend 5) and the Finnish Environment Institute, the government analysed the funding of experiments, tests and policy trials in Finland. Based on their findings, they decided to establish a new digital platform for piloting and experimenting public innovations. This platform is designed to promote useful initiatives and new practices by supporting small trials initiated by citizens, as well as by funding large-scale, precisely evaluated experiments backed by the government. The platform also enables users to obtain conclusive evidence on how initiatives work in practice and to disseminate their benefits more effectively.

Given that ideas need time and inspiration to merge, develop and improve, the platform allows users to browse content, obtain ideas for their own project, and communicate with each other to help market and share their innovations. The digital platform separates innovations into three levels: the strategic level, pooled pilots and partnerships, and the grassroots level. At the strategic level, the government selects five to ten pilot studies that are connected with broader strategic objectives and key government projects. Pilot studies include those related to basic income, service initiatives and local government trials. These pilots will be monitored and supported by the Experimental Finland Team in the Prime Minister's Office.

The pooled pilots and partnerships level includes pilot studies that promote the objectives of the government programme, but that are developed by regional governments, NGOs or businesses. The goal at this level is to identify and support the best results from local and regional experiments and ultimately to test them on a larger scale. Finally, at the grassroots level, municipalities, academics, civil society organisations and citizens can use the application to promote their innovation, with each actor individually monitoring their own activities. The

government hopes that users will reach into the thousands, and that the platform will enable innovators to establish links with support and funding networks. The government further believes that this method represents a democratic way to develop the public sector.

NOVELTY

The combination of an open platform that connects innovators directly to sources of capacity building and funding, while promoting an open and democratic response to developing public services, appears to be unique. While experiments, crowdsourcing and crowdfunding are on the rise around the world, the designers of this tool have not found any examples of a similar approach elsewhere.

IMPACT AND RESULTS

Given that the platform was launched only recently, it is too early to gauge impacts or assess results.

REPLICABILITY

Even at this early stage, it is clear that the platform's rapid development (under 6 months) and relatively low costs should help facilitate replication in other countries. Furthermore, the platform constitutes a relevant example for countries looking to increase citizen engagement in policy making and co-creation. The tool's ambitious goals, rapid development and practical approach all serve to make this an innovation that has the potential to shift the boundaries between the government and its citizens – and may also serve as a global model for similar cases worldwide.

CHALLENGES AND LESSONS LEARNED

The design and creation phase of the digital platform presented a challenge, as the tool needs to attract users and ultimately be successful enough to impact the development of public services. Its development was made more difficult by the tight timelines. However, many of the primary challenges facing this digital tool will arise with usage, including those around developing the processes and structures to support and maintain the platform's functions. Other key challenges will involve ensuring users join and stay involved and that the platform continues to receive political support.

Furthermore, the rapidity with which the tool was created means that a number of issues are still open for discussion. Most crucially, there is still some debate regarding who will evaluate the experiments and how best to manage the provision of capacity building. Additionally, the Government of Finland must decide how best to ensure continued political support and buy-in after the remaining two years of its mandate, so as to ensure sustainability.

Figure 3.10: Place to Experiment process

Source: Finland Prime Minister's Office.

Trend 4
Mass or personalised services: the next generation of service delivery

The world is changing at a remarkable pace and each new advance is accompanied by expectations on the part of its citizens. Governments at the forefront of innovation are re-inventing their operations to better meet these expectations by providing services more attuned to the lives of their citizens, residents and customers, based on a deep understanding of their needs. Traditional government services are often highly compartmentalised and provided to citizens in a disjointed fashion based on government structures, rather than the needs of the people. Innovative governments have realised that a citizen should not have to know the internal workings of large and complex bureaucracies to obtain the services they require. They have begun to change the way in which they do business by providing more holistic solutions that optimise services, according to the needs of citizens, and continuously improve services in response to feedback. This not only benefits citizens, but also enhances the overall functioning of government, by creating new opportunities to partner with other agencies, non-profit organisations and businesses.

WHAT IS DIGITAL GOVERNMENT?

Digital Government refers to the use of digital technologies, as an integrated part of governments' modernisation strategies, to create public value. It relies on a digital government ecosystem comprised of government actors, non-governmental organisations, businesses, citizens' associations and individuals which supports the production of and access to data, services and content through interactions with the government.

Source: OECD, 2014.

The rapidly evolving technology field has helped to drive innovation in government services. Digital government efforts have arisen in response to growing citizen expectations for convenience and responsiveness in government services equivalent to services provided by private sector companies such as Google or Amazon. The concept of user-centred design did not originate in the technology field, but this field has contributed to a more universal recognition of these design principles, including within innovative digital government initiatives. For example, the US Digital Services Playbook[41] (published by USDS, discussed in Trend 2) promotes a more holistic approach to understanding people's needs by encouraging civil servants to work closely with citizens and end users. It views the whole experience from start to finish with an emphasis on understanding all points of interaction between a government service and its users. The United Kingdom's Government Digital Service Design Principles[42] similarly focus on user needs. This trend is not limited to the efforts of digital government. In Canada, the Institute for Citizen Centred Service has formed formal units that bring together all levels of government to gain a common understanding and approach to delivering citizen-centred services and measuring satisfaction.[43]

41. See *https://playbook.cio.gov.*

42. See *www.gov.uk/design-principles.*

43. See *www.iccs-isac.org.*

"The needs of people – not constraints of government structures or silos – should inform technical and design decisions. We need to continually test the products we build with real people to keep us honest about what is important."

US Digital Services Playbook

"Citizen-Centred Service incorporates citizens' concerns at every stage of the service design and delivery process; that is, citizens' needs become the organising principle around which the public interest is determined and service delivery is planned." [44]

Deputy Minister's Task Force on Service Delivery, Canada

44. See *www.oecd.org/governance/budgeting/39761644.pdf.*

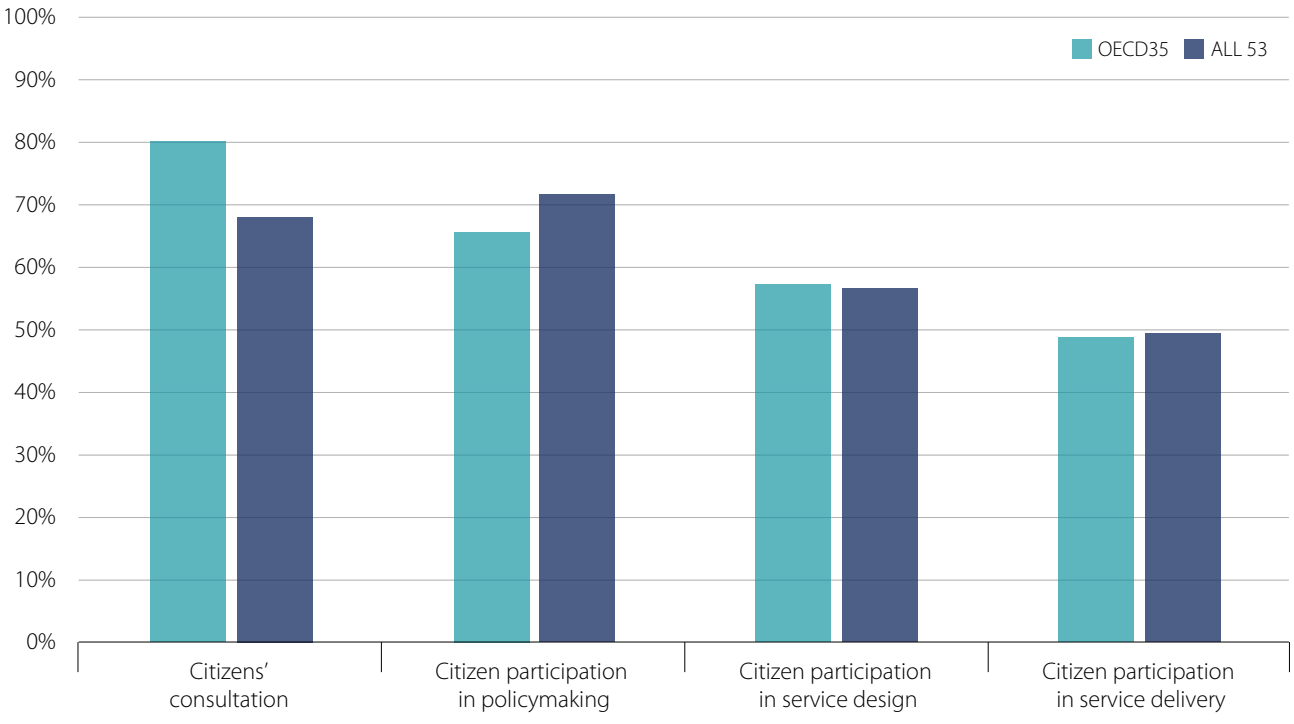
Figure 4.1: US Digital Services Playbook Plays

Digital Service Plays

1. Understand what people need
2. Address the whole experience, from start to finish
3. Make it simple and intuitive
4. Build the service using agile and iterative practices
5. Structure budgets and contracts to support delivery
6. Assign one leader and hold that person accountable
7. Bring in experienced teams
8. Choose a modern technology stack
9. Deploy in a flexible hosting environment
10. Automate testing and deployments
11. Manage security and privacy through reusable processes
12. Use data to drive decisions
13. Default to open

Source: https://playbook.cio.gov.

Figure 4.2: Countries with initiatives that focus on public engagement



Source: OECD (2016).

USER-CENTRED DESIGN

User-centred design is a development method that helps to ensure a service will be easy to use. The principles that support user-centred design are:

1. The design is based upon an explicit understanding of users, tasks and environments.
2. Users are involved throughout design and development.
3. The design is driven and refined by user-centred evaluation.
4. The process is iterative.
5. The design addresses the whole user experience.
6. The design team includes multidisciplinary skills and perspectives.

Source: www.userfocus.co.uk.

OECD's 2015 Open Government Survey shows that some countries involve citizens and residents in service delivery; however, there is much room for growth. A little under half of OECD countries (about the same for all 53 responding) involve citizens in service delivery, with a little more than 57% involving them in service design (same for all respondents) (Figure 4.2). This is quite a bit lower than the 80% of OECD countries (68% for all respondents) with consultation initiatives, or the 66% of OECD countries (72% for all respondents) that have launched initiatives to involve citizens in policy making (see Appendix II for a full breakdown). This is somewhat surprising, since services touch citizens more closely than policy. Countries may be moving in a more innovative direction, as the trends and examples in this review hint that governments are working to close this gap.

This shift to using the common tools of the technology industry, such as user-centred design and agile development, can be seen in the ways governments are driving innovation for the next generation of government services. One example of these approaches in action is found in the Virtual Warsaw case study at the end of this trend and featured in the *Edge of Government* exhibit.

Inseparable from the phenomenon of the digitisation of government is the massive and exponential growth of data that can be leveraged to better provide citizen-centred services, which has been touched on in Trend 1 of this report. The increasing need for and use of data within governments challenges vertical silos and necessitates greater co-operation across the public sector and between sectors. Co-operation over the sharing and use of data can change the way in which governments perceive and treat citizens. In the most innovative programmes, citizens are no longer reduced to a single issue – income taxes, child benefit, medical treatment, etc. – but are instead viewed more holistically. Data are used to provide an overview of their interactions with the public administration across a range of different services throughout their lives. This enables governments to identify opportunities for innovation to improve services based on citizens' characteristics and their existing relationship with government. When citizens are viewed holistically, governments can make concerted efforts to measure and improve their overall wellbeing and happiness. Leading this trend is the city of Santa Monica, California, in the United States, as discussed in the case study on the Wellbeing Project, found at the end of this trend. The OECD has embarked on a similar effort on an international level with the Better Life Index.[45] This tool allows users to compare wellbeing across countries, based on 11 topics the OECD has identified as essential, in the areas of material living conditions and quality of life.

5. See *www.oecdbetterlifeindex.org*.

Source: http://wellbeing.smgov.net.

The exponentially increasing volume and velocity of data available to governments has opened the door for new opportunities to achieve improvements in overall wellbeing and happiness through the "hyper-personalisation" of services, and the most innovative governments are seizing these opportunities. Defined as the use of data to provide more personalised and targeted products, services and content[46], the concept recognises that every citizen has unique needs, wants and even biology, and that government services can be personalised in a way that helps each individual thrive on a personal level. Hyper-personalisation has been implemented in a range of industries to improve customer interaction and influence purchasing behaviours. For example, recommended selections on iTunes or Amazon can increase conversion rates by about 50%.[47] Until recently, this concept was largely foreign to the public sector, but governments leading in innovation have begun to recognise the power of hyper-personalisation and are providing targeted services to maximise outcomes, such as in the United States Precision Medicine Initiative (see box). An additional feature of hyper-customised services is that they enable citizens to make decisions regarding how they wish to receive services from the government (Bertot et al., 2016). Such services can even take anticipatory actions to address citizens' needs before the citizen even knows that the need exists. In Estonia, the Ministry of Economic Affairs and Communication is developing an act to permit proactive services. These services can be based on analytics of the country's data, and can be provided automatically or with permission from the citizen involved. This type of service is very new, but is already manifesting in certain ways. For example, in Estonia, when a child is born in a hospital, all of the services connected to childbirth are automatically initiated.

A major trend in many OECD countries is the promotion of greater interaction between doctors and patients, so that patients can become more involved in the management of their health problems and in decisions about treatment options reflecting their preferences. Among the OECD countries participating in the 2013 Commonwealth Fund Survey, patients generally responded positively regarding their involvement (see Figure 4.3).

The exponential growth of data collection and analytics, and the emerging use of hyper-personalisation in public service delivery also bring some challenges. Privacy advocates have raised concerns about the potential over-collection or irresponsible use of collected data, which can occur even inadvertently. There have also been instances where the underlying algorithms for services used by government have been shown to incorporate potential bias. To overcome these challenges, governments must be transparent about the data they collect, and need to clearly demonstrate the value of the resulting products and their collections efforts. Recognition of this point is leading to a new type of public service innovation that emphasises transparency, with a view to building trust and mitigating risk. However, there are few examples of such transparency, which signals a need for more attention on this subject. France, however, has addressed these challenges in an innovative manner, becoming a global leader in the growing movement for using "algorithmic transparency" to improve citizens' "confidence in their services" (see box on next page). As governments work to enhance service delivery by harnessing data, they will need to enhance the corresponding level of transparency.

Although the growing sums of data available have enabled a

UNITED STATES PRECISION MEDICINE INITIATIVE

One example of hyper-customisation in practice in government today – based on biology and lifestyle – is the United States Precision Medicine Initiative. Its mission is to promote a new era of medicine through research, technology and policies that empower patients, researchers and providers to work together toward the development of individualised care.

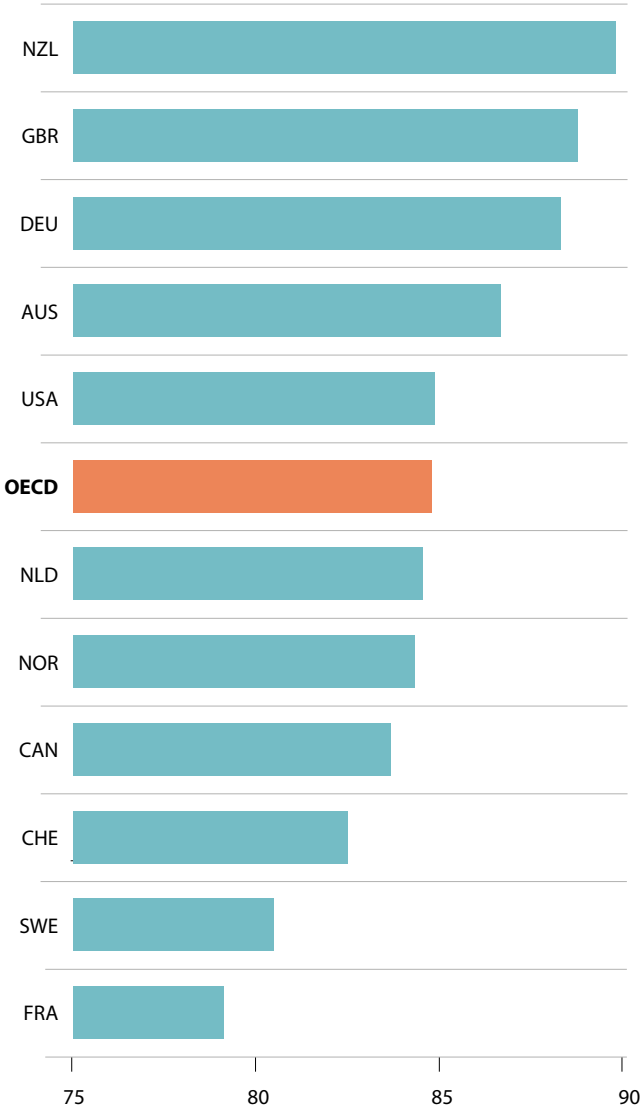
Currently, most medical treatments are designed for the "average patient". However, treatments that are successful with some patients may not work with others. This initiative takes into account individual differences in people's genes, microbiomes, environments and lifestyles, making possible more effective, targeted treatments for diseases such as cancer and diabetes. It requires different types of data collected by health care providers and the patients themselves.

Source: www.whitehouse.gov/blog/2015/01/21/precision-medicine-improving-health-and-treating-disease.

46. See *www.business2community.com/marketing/whats-hype-around-hyper-personalization-01045882.*

47. See *http://knowledge.wharton.upenn.edu/article/different-worlds-do-recommender-systems-fragment-consumers-interests.*

Figure 4.3: Regular doctor involving patient in decisions about care



Source: Commonwealth Fund International Health Policy Survey 2013.

OPEN SOURCING FRANCE'S TAX CALCULATOR

The government of France has made available the source code of the fiscal calculator used by the French fiscal administration to calculate the income taxes for over 37 million French individuals. The objective is to help people better understand how taxes are calculated and build trust in the fiscal system through transparency.

Source: https://joinup.ec.europa.eu/community/opengov/news/france-improves-fiscal-transparency-opening-tax-calculator.

wave of hyper-personalisation, not all personalised services relate to data or even technology in general. The *Edge of Government* exhibit features an interesting example of assisted living facilities in the United States that help people with dementia or Alzheimer's disease recover and hold on to their memories. Instead of rooms or units, each resident gets a "home" on a quiet little indoor street reminiscent of the neighbourhoods many of them grew up in the 1930s or 1940s.[48] The CEO of Lantern,[49] the company that manages these communities, says that they also help reduce anger, anxiety and depression. Although these communities are run by the private sector due to the largely private nature of the United States health care system, governments with public-run facilities around the world may be able to learn lessons from this example.

Discussion of non-digital innovative service delivery has also highlighted the growing recognition among governments that services should move closer to people, and not the other way around, has resulted in significant improvements to the health, happiness and security of people around the world. In particular, examples from Japan and Iceland demonstrate the importance of serving people where they reside (see box on next page).

Innovating services to take a citizen-centred approach is an important step in improving citizens' lives and wellbeing. Governments can take these improvements even further by better understanding and rethinking the way in which their services interact with each other and with citizens. A growing field in innovative service delivery is "systems thinking" (OECD, 2017), which can enable innovation at a systemic level to make public services more effective and resilient. While systemic approaches are not new, efforts to innovate services through systems thinking are recent and still largely unexplored. They recognise that twentieth-century institutions are outmoded by twenty-first century problems stemming from interconnectivity, cyber threats, climate change, changing demographics and countless other factors. Traditionally, governments have dealt with these problems through discrete interventions layered on top of one another. However, these piecemeal reforms are

48. *http://mentalfloss.com/article/85585/assisted-living-facility-designed-look-neighborhood.*

49. *http://lanternlifestyle.com.*

JAPAN – *7-ELEVEN* STORES AS LIFELINES FOR THE ELDERLY

By 2035, one-third of the population of Japan will be over the age of 65. Convenience stores such as 7-Eleven are adapting to better meet this demographic by introducing home delivery, healthy foods and pharmacies. Some are setting up elderly care and nurse support counters and offering community-gathering spaces for seniors. To bring services closer to the elderly, the government is partnering with convenience store companies to open 100 stores inside senior housing complexes, which will provide added senior-focused services.

ICELAND – UNITED AGAINST VIOLENCE

Reykjavik, Iceland, has launched an innovative approach to fight and prevent domestic violence. In the event of a reported incident, all relevant services are brought together to the scene. A social worker is summoned to provide counselling, child advocates ensure children are safe and cared for, and the police perform an investigation and arrange for a restraining order and medical evaluation. To help prevent future incidents, the perpetrators also receive counselling and assistance. The innovative service delivery model helps 2 400 people a year and has raised awareness about domestic violence.

Source: www.citylab.com/navigator/2016/08/how-7-elevens-are-becoming-lifelines-for-japans-elderly/493772 and Call for Innovation submission from Iceland.

no longer providing results in many areas, and may shift consequences from one part of the system to another, or continually address symptoms while ignoring the true causes of problems. Systems thinking usually begins by redefining the purpose of public services and the public value connected to the services. Based on this information, public organisations can start to assess whether their current system is fit for purpose or not and what could be improved.

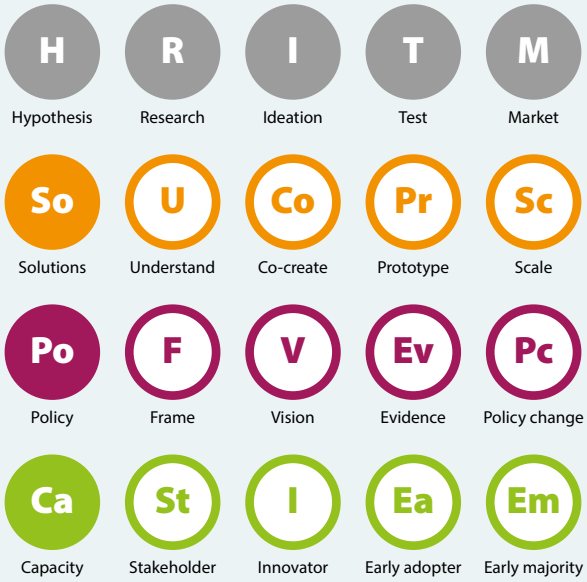
In many cases, governments need an objective arbiter to facilitate this process, as it is difficult to change established processes from within. For example, MaRS Solutions Lab in Toronto, Canada, helped the city and the province of Ontario open up discussions on regulating the sharing economy.[50] Platform companies such as Uber, Airbnb and others were challenging traditional service models in transportation and accommodation, and as a consequence, the public value of providing a ride or accommodation (in terms of public safety, liability, fair competition, etc.) had to be re-imagined. This is not an easy process, particularly when governments and societies are confronted with quick and disruptive change. Moreover, it is difficult to tackle and change established service structures (e.g. de facto monopolies of taxi industries). The structures of these problems are complex, but systems thinking helps to step back and identify the root challenges through a focus on the ultimate purpose of a public service.

It is clear that the most innovative governments take a people-first point of view, and have learned that a foundational prerequisite to achieving this is actively listening to citizens and residents, and incorporating channels for feedback and two-way interaction. This is the core principle of user-centred design. Moreover, it sets the stage for continuous innovation, where governments iterate and experiment with new approaches to services on a continual basis depending on what they hear and learn. Any individual "innovation" goes through a lifecycle and exists in a temporary state. Once implemented, the innovation either fails or is diffused more broadly across government, thereby losing its novelty and status as "innovative". These channels for communication keep innovation from reaching a plateau. For governments working to rethink the boundaries of citizens and government, innovation never ceases; it is simply an open-ended part of doing business. One example of this approach, submitted through the Call for Innovations, can be seen in efforts underway in Canada to develop innovative approaches to helping immigrants and refugees overcome challenges such as unemployment and social isolation. The goal is to develop small-scale prototypes to test the effectiveness of non-traditional settlement services. Regular feedback from delivery partners and newcomer participants shapes the evolution of the prototype, and those with a real impact are scaled up.

50. See *www.marsdd.com/systems-change/mars-solutions-lab/news/new-sharing-economy-redesigning-regulation-public-report*.

PERIODIC TABLE OF SYSTEMS CHANGE

MaRS Solutions Lab developed a framework for understanding the different kinds of elements required to navigate and alter complex systems. The method acknowledges that for systems to change, it is not enough to tackle policies and provide solutions – to make the process successful systems thinking needs to tackle the capacities of different stakeholders. The graph below illustrates how different stages of systems change – hypotheses, research, testing and marketing – have to be considered through the levels of capacity, specific solutions and policy. Each level requires different actions and resources during the systems change process. For example, to regulate the sharing economy, the City of Toronto needed new competencies and the capacity to understand the newly emerging service models and deal with the unintended consequences. At the same time, policies regarding insurance, taxation and entry to the market also had to be reframed. As governments are continuously faced with increasingly complex problems, these insights play a central role in initiating and implementing change.



Source: www.marsdd.com/systems-change/mars-solutions-lab/mars-solutions-lab-approach.

Challenges

Changing business processes and modes of thinking in government, and the associated duties and culture of its civil servants, is not an easy task. Although reorienting government services to better account for citizen needs may seem like common sense, in many ways it represents a fundamental shift in the beliefs and actions that have purveyed in governments for generations. There are many challenges to innovative service delivery, and overcoming them is key to developing the next generation of government services. Key challenges in this area touched on in this trend are:

Lack of communication with citizens. This prevents governments from gaining explicit understanding of their users' needs. Without communication there is no foundation for the next generation of government services. This can sometimes be due to a culture that maintains the status quo, which may have relied on internally driven decision making. There could also be rules that discourage citizen interactions. For example, in the United States the Paperwork Reduction Act (PRA) has been cited as a potential challenge to citizen interaction for things such as user-centred design.[51]

Siloed and compartmentalised organisations and services. These force citizens to work to understand their government, when the reverse should be true. Such structures minimise the possibility of developing services that serve citizens holistically, and limit systems-thinking approaches, as systems interactions are not clear beyond an organisation's own boundaries.

Lack of data and information sharing. Lack of sharing is highly related to silos and limits a government's ability to develop holistic, anticipatory and personalised services. It also burdens citizens who seek services with frequent requests for duplicate information.

51. See *http://uxpamagazine.org/us-government-ux-work.*

Contributing factors

Emphasising that government serves the people. Innovation in citizen-centred services can best take hold when senior leaders in government develop policies, strategies and communications that continuously emphasise that the purpose of government is to serve the needs of the people, and ensure that policies and services are designed to reflect that purpose.

Embracing the role of facilitator. It is clear through this review that the role of government in service delivery is changing. The era of governments making service decisions without thorough and continuous communication with the intended beneficiaries is coming to a close. Innovative governments are becoming increasingly connected across administrations and with their citizens. To achieve this, they are adopting the role of a facilitator, providing a platform for civil servants, citizens and other relevant parties to come together and collaborate on common solutions.

Providing ways to work around bureaucratic barriers. Remedying the challenges associated with siloed structures does not necessarily require a reorganisation of the structure of government. It is possible that a new structure would simply establish a newly shaped bureaucracy, but one that citizens are not familiar with. Instead, innovative governments have found ways to work around these lines to connect citizens and civil servants. For example, in the example of Code.gov, each agency is responsible for maintaining its own software inventory. However, they must use uniform fields and locate the inventory in a uniform place on public websites. The inventories for all agencies are then pulled together and represented on Code.gov in a centralised manner that enables citizens and civil servants alike to know what relevant software exists throughout government. Two-way dialogue features are also present to provide a platform for discussion. For such methods to work, strong political support through policy making and prioritising innovative methods is needed.

Recommendations

Despite these challenges, the examples and case studies in this trend show that delivering innovative, citizen-centred services can be done, and is already underway in a number of countries. There are several areas in which governments can take action that can help them to succeed. Although re-orientating government towards innovation is likely to require a series of actions, the following five recommendations can help build the foundation and capacity for innovative service delivery:

1. **Clarify rules and regulations.**
   Ensure that civil servants are empowered to interact with other organisations and citizens in the development and refinement of services, and encourage this behaviour from the most senior levels of leadership.

2. **Promote interaction among civil servants.**
   Provide a means for civil servants from multiple organisations to come together around topics that are relevant to their missions, as well as a means for them to connect to citizens. This can be done digitally, as well as through in-person meet-ups.

3. **Catalogue data comprehensively.**
   Require comprehensive cataloguing of government data and provide a means for civil servants to discover and share these data. Make this information available to the public, as appropriate given security and privacy considerations.

4. **Be transparent about data collection and use.**
   Be transparent about what data are collected, how they are used and how decision making that affects citizens is made to foster trust, as discussed in Trend 1 of this report.

5. **Engage partners with shared values.**
   Seek out opportunities to partner with businesses and civil society organisations that share the same citizen-centred values. This can be seen in the way the Virtual Warsaw team partnered with the Polish Blind People Association to conduct user testing (see the following case study). Citizens often place more trust in these entities than in their government and are more willing to interact with them, making them key allies in helping to ensure government policies and services meet the needs of the people.

The Wellbeing Project

Santa Monica, California, United States

"It sounded simple. We'll measure what matters most: how people are doing. And then use that information to guide our work. There was just one thing: no one had ever done it before."
Julie Rusk, Santa Monica City Hall

SUMMARY

Are citizens happy, healthy and connected as a community? Do they have access to opportunities for a lifetime of learning and growth? Do they feel empowered to make change? Does the local economy help them achieve their goals? What can we do to help them thrive? These are some of the questions the City of Santa Monica, a small beachfront community bordered by Los Angeles, set out to answer in its quest to put wellbeing at the centre of its work. The city is tapping into the power of data to understand the needs, challenges, and strengths of the community in order to make decisions that will improve people's lives and strengthen the community. This is the Wellbeing Project.[52] At its core is the Wellbeing Index, which combines multiple sources of data to measure a full spectrum of factors known to impact one's wellbeing, and in turn, the wellbeing of the community. By providing a common language, mission, and goals for the city organisation, the Index framework is helping the city work more effectively across departments and with community partners. Findings from the Index guide the city's efforts to cultivate partnerships, set policies, and develop programs to help all residents thrive. It also provides information to empower community members to take charge of improving their own wellbeing.

52. www.smgov.net/wellbeing

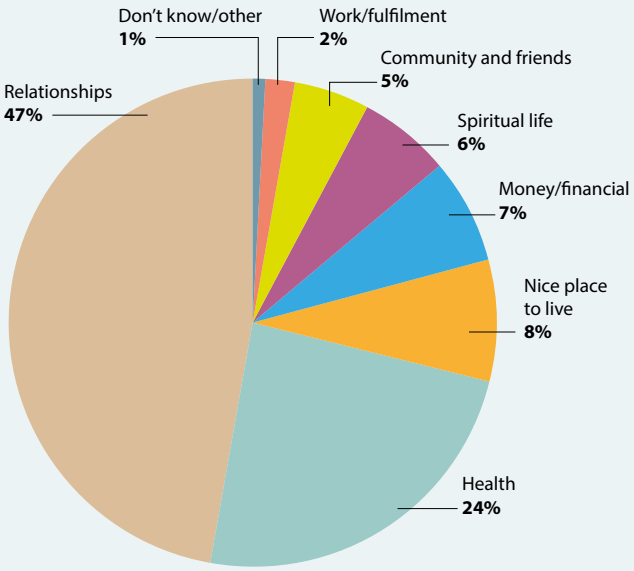
THE PROBLEM

Governments around the world are starting to recognize that economic growth alone does not truly represent the strength or success of a community. True measures must take people into account. How are they doing? What challenges do they face? What decisions can we make to help them address those challenges? So a few years ago, Santa Monica – a city known for its commitment to innovative approaches to tacking complex issues – was rocked by a quick succession of tragedies involving local youth. A teen was shot and killed in a park. Another teen committed a public suicide in front of his classmates. And then a young adult who grew up in Santa

Monica committed a shooting at a community college while in session, resulting in 6 dead and many more traumatized. Santa Monica – the city, school district, community college, service providers, and concerned citizens came together to find the answer to one question: "How, in a community as resourced as ours, can this be happening?"

This was a call to action that could not be ignored. The city and community realized that they needed to be able to better understand the critical issues faced by citizens. They did not have the ability to objectively assess trends, counter challenges, and celebrate strengths from a holistic perspective. Without this, it would be difficult to make decisions and then know if those decisions were truly making a positive impact.

Figure 4.4: Factors that influence happiness



Source : Adapted from Sustainable Development Commission, 2009.

AN INNOVATIVE SOLUTION

This call to action prompted this small community to look to data in order to genuinely understand how people were doing in order to form effective strategies to work together to address the complex issues lying under the surface. Because of its relatively small size and wide range of community assets, Santa Monica is an excellent urban laboratory to test out innovative solutions. For example, the city was at the forefront of use of data to improve environmental conditions, sustain and increase affordable housing, and address homelessness with compassion. What began as a broad community effort to address youth violence by focusing on underlying factors was scaled up into an effort to better understand the wellbeing of the community as a whole, regardless of age, background, and other socioeconomic characteristics, based on the science of wellbeing, such as the factors that contribute to happiness (see Figure 4.4).

The result was the Wellbeing Project, an innovative approach to put data to work to help local government better understand and meet the needs of the people it serves. Inspired by Santa Monica's previous innovations, the concept was developed with input from the public, city staff, and community partners. It moved from concept toward reality thanks to funding from Bloomberg Philanthropies, as

Figure 4.5: Six dimensions of the Wellbeing Index

Source: http://wellbeing.smgov.net/about/wellbeing-index.

one of five winners in the first Mayors Challenge to ignite innovation in local government.[53]

The key component of the Wellbeing Project is the Wellbeing Index, which provides city officials with a multidimensional picture of the existing strengths, gaps, and challenges faced by community members through analysis of data yielded from multiple sources. The framework for the Index was developed by the city, in partnership with RAND Corporation and an international panel of experts. It provides comprehensive measures on community wellbeing across a number of dimensions (see Figure 4.5).[54]

NOVELTY

The Wellbeing Project is a ground-breaking model for local government that uses the science of wellbeing and multiple data perspectives as a lens through which they can better understand the people it serves. The Index includes data yielded from administrative, behavioural, and subjective sources. By blending these things together, the city and its partners are able to look beyond traditional performance measures to truly understand the complex interplay of factors that impact one's quality of life. The Index includes factors like affordability, mobility, stress, equity, and purpose. This makes it possible for the City of Santa Monica to orient its work in a way that residents can intuitively understand, and to measure our impact in a more meaningful way.

IMPACT AND RESULTS

The City of Santa Monica is making great strides toward truly embedding wellbeing metrics into everything it does. The first iteration of the Index created a baseline for understanding the elements that contribute to positive wellbeing.[55] Since then, Santa Monica's Wellbeing Index framework has become the new operating system for the organization. It is being used by all city departments to form

the next city budget and work plan priorities. It is also being used to engage with community partners and residents in new ways to work together on key issues and to bring the community together to enhance wellbeing through social connections, an important aspect of wellbeing (see Figure 4.6). In addition, it has prompted the city organization to take a hard look at its data culture and actively work to improve it.

53. See *http://mayorschallenge.bloomberg.org.*

54. See *wellbeing.smgov.net/about/partners-and-panel* for more information on partnering organisations and experts.

55. See *http://wellbeing.smgov.net/about/wellbeing-index* for detailed findings from the Wellbeing Index.

Finally, the Project has generated a renewed sense of purpose among civil servants, giving them a new way think, talk, and feels proud about their work.

REPLICABILITY

Wellbeing and happiness are universal objectives for any community. With a desire to improve the wellbeing and happiness of others, Santa Monica designed the Wellbeing Project with replicability in mind. It is an open source project, so the methods and tools can be shared and duplicated by other communities interested in enhanced wellbeing. To this end, the city is working on a playbook to help transfer knowledge and share lessons. A longer-term goal is the cultivation of a network of communities that, once armed with common data and metrics, can learn from each other. Furthermore, as the wellbeing results for Santa Monica are available as open data, private and non-profit organisations have used them to emphasise wellbeing in their products and services.

INTEGRATE
Quality of Life
INTO CITY FOUNDATION

CHALLENGES AND LESSONS LEARNED

The Wellbeing Project surfaced a number of underlying challenges common among cities the size of Santa Monica, including outmoded ways of operating and inconsistencies within the organization's data culture. The city has learned that it needs to find ways to better align its work efforts across departments, advance data literacy across the board, take a more objective and proactive approach to problem solving, and cultivate more meaningful and constructive relationships with its constituencies. This has already generated significant shifts in how the organization operates and works together.

Figure 4.6: Importance of social connections

Source : http://wellbeing.smgov.net/findings/community

Virtual Warsaw

Warsaw, Poland

SUMMARY

To ensure accessibility and inclusiveness for the visually impaired, the City of Warsaw launched "Virtual Warsaw", a virtual smart city based on Internet of Things (IoT) technology that gives eyes to those who have trouble seeing. The city is deploying a network of hundreds of thousands of beacon sensors equipped with next-generation Bluetooth to help visually impaired residents move independently about the city with assistance from their smartphones.

THE PROBLEM

Tasks such as catching a bus to work or going to a museum with friends are often taken for granted by people with five fully functioning senses. However, the 40 000 Warsaw residents with visual impairment face additional challenges that limit their accessibility to important services, and by extension, limit their independence, employment and education opportunities, and overall wellbeing. About 85% of these sight-impaired residents report having a strong sense of dependency on others in order to live their lives, and over 80% are unemployed. This group also reports challenges in actively participating in activities such as shopping and spending free time with their friends. A major factor in these high rates is that it takes about 65-95 hours of work with an individual trainer to learn how to move safely about the city, *per place*.

AN INNOVATIVE SOLUTION

To make it easier to move about the city and to increase the accessibility of Warsaw and the happiness and independence of its visually impaired residents, the city launched Virtual Warsaw. Like the Wellbeing Project, Virtual Warsaw was a winner of the Bloomberg Mayors Challenge, which helped to kickstart the innovation. The programme consists of two major components:

- **A micro-navigation system:** a personal guide and assistant that allows any owner of a smartphone to receive written or verbal information on their surroundings, such as the location of bus stops, the number of arriving trains, the entrance to museums or where to queue in municipal offices.

- **A support system:** an individualised programme of activities and services specifically designed to help visually impaired people feel more independent in public spaces and the labour market. It consists of training, career consultations, internships, and a dedicated helpline to help them navigate the city and job market, and to connect with other visually impaired residents.

The micro-navigation system seeks to build a citywide infrastructure that supports and empowers the visually impaired to fully experience their city. It is powered by an open network of micro-transmitters that serve as a layer of physical beacons which create a virtual space accessible to smartphone applications. These can then be navigated through a series of hand gestures on the screen. Information is provided to the user both visually and through audio. The system allows visually impaired individuals the ability to navigate the city outside, as well as inside buildings, even when no mobile signal is available. Because many of the potential beneficiaries have previously had little or no need for a smartphone, subsidies are available to residents unable to afford one. Users have reported that this step alone can be empowering, as they now have a reason to use the same types of phones as everyone else.

Virtual Warsaw is being rolled out incrementally. Starting with an initial pilot in one city building, it is in the process of expanding to the city centre, core bus routes, tourist attractions and restaurants. The city will continue to expand the programme over the next several years, with full-scale implementation of Virtual Warsaw expected throughout

Figure 4.7: Virtual Warsaw infographic

Source : Government of Warsaw.

the city and 24 regional municipalities by 2021. There is no limit to the number of connection points or the types of information that can be provided by Virtual Warsaw.

Although the focus for the present and near future is on improving lives for the visually impaired, this is just the beginning. The beacons being deployed around the city are multi-functional, and Warsaw has plans to leverage the citywide network for other purposes, including as guides for tourists, gauges for air quality and even for 20 000 meter-less parking spaces. Warsaw leaders believe there could be up to 200 000 monthly users for this system once it is fully operational.

IMPACT AND RESULTS

Although still in pilot mode, Virtual Warsaw is already starting to create opportunities for enhanced independence among the visually challenged population, and the potential is huge. This has the dual benefits of increasing the wellbeing of those using Virtual Warsaw, as well as improving the efficiency of government, as residents with improved independence require fewer city services. An indirect benefit is that the government has learned through this process that user-centred design can be highly successful, resulting in this model spreading to other government offices.

REPLICABILITY

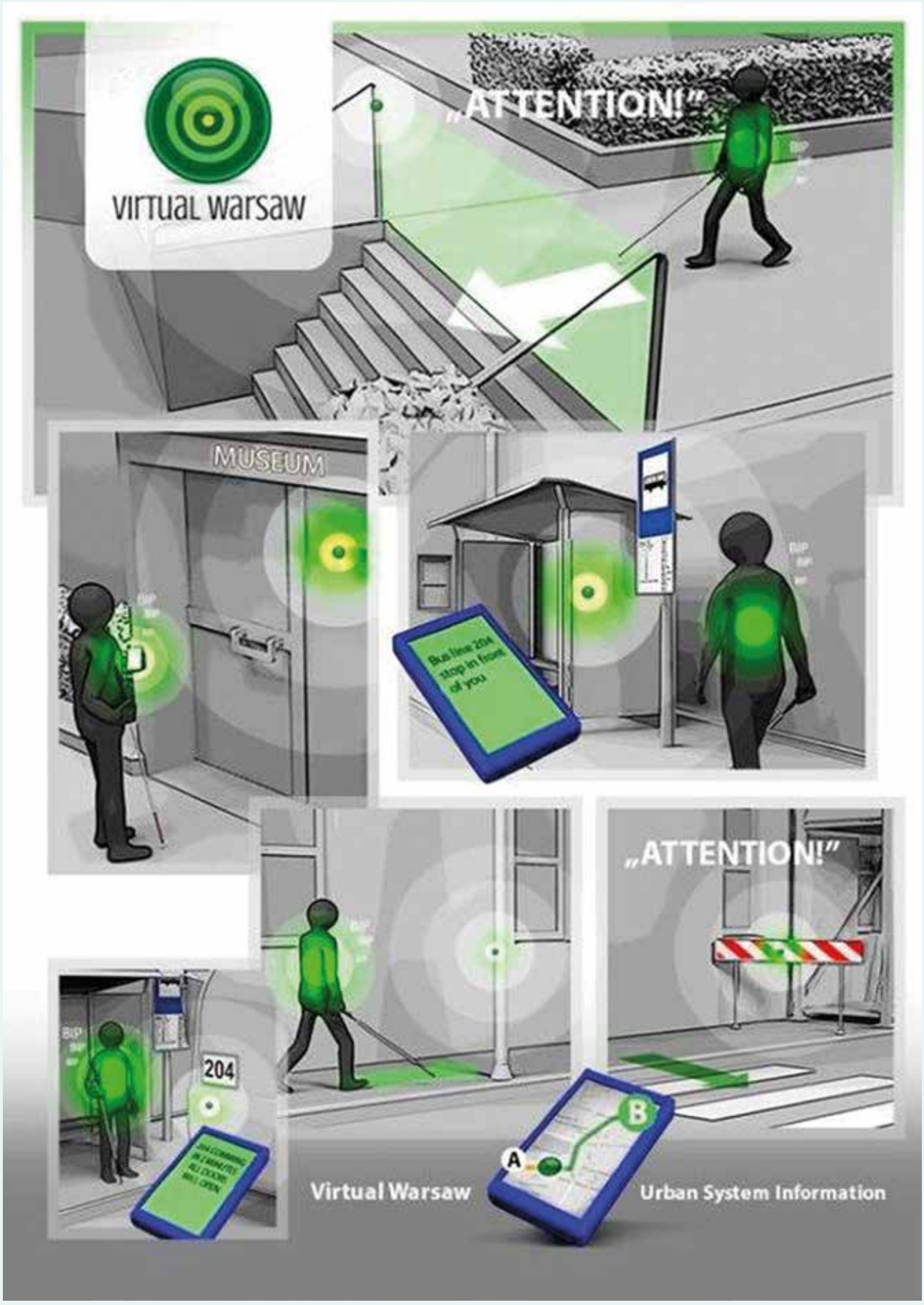
At their core, the challenges for people with visual impairments are the same in every city. Like everyone else, these residents want to be independent in their daily activities, have a career they enjoy and friends with which they can enjoy the city. Micro-navigation and support systems can be deployed in any city, and Virtual Warsaw can serve as a template for others to quickly introduce such services, and build on the successes and lessons learned in Warsaw. Warsaw officials wanted to play an active role in the replication of Virtual Warsaw in other cities to benefit the visually impaired. This led to the launch of the Virtual Warsaw Think Tank dedicated to coordinating with cities around the world and providing information and assistance to others wanting to implement similar programmes. The demand for replication is strong, with almost 40 other cities expressing interest in replicating the programme in their communities.

Virtual Warsaw user testing.

CHALLENGES AND LESSONS LEARNED

The city faced challenges early on that stemmed from insufficient user perspective. The initial pilot version included features such as GPS-style turn-by-turn directions, which subsequent users found unnecessary and were later removed, resulting in loss of time and resources. This was a turning point, prompting Warsaw to shift to user-centred design. Now, as Virtual Warsaw expands, each step is carried out with visually impaired end users, who test the system and provide feedback to allow continuous improvement. In addition, the users generate ideas for locations and features to prioritise.

As well as working with users, leaders in Warsaw have found that building partnerships is critical to the success of Virtual Warsaw. They partnered with a small, local business to build the beacons, which they say is key, as a larger company might not have been able to build such a customised product. City officials also partnered with NGOs such as the Polish Blind People Association, universities and other experts in the fields of visual impairment to better understand the challenges and needs of the target audience, as well as specialists in user experience (UX) design, accessibility and software development. The Polish Blind People Association, in particular, has been helpful in recruiting testers, with the city learning that people may be more willing to place trust in an NGO. Warsaw officials believe that partnerships are key, because their partners may have wider access to the target groups, which can lead to services that best meet their needs, as well as broader adoption and use of the service.



Virtual Warsaw visual demo.

Trend 5

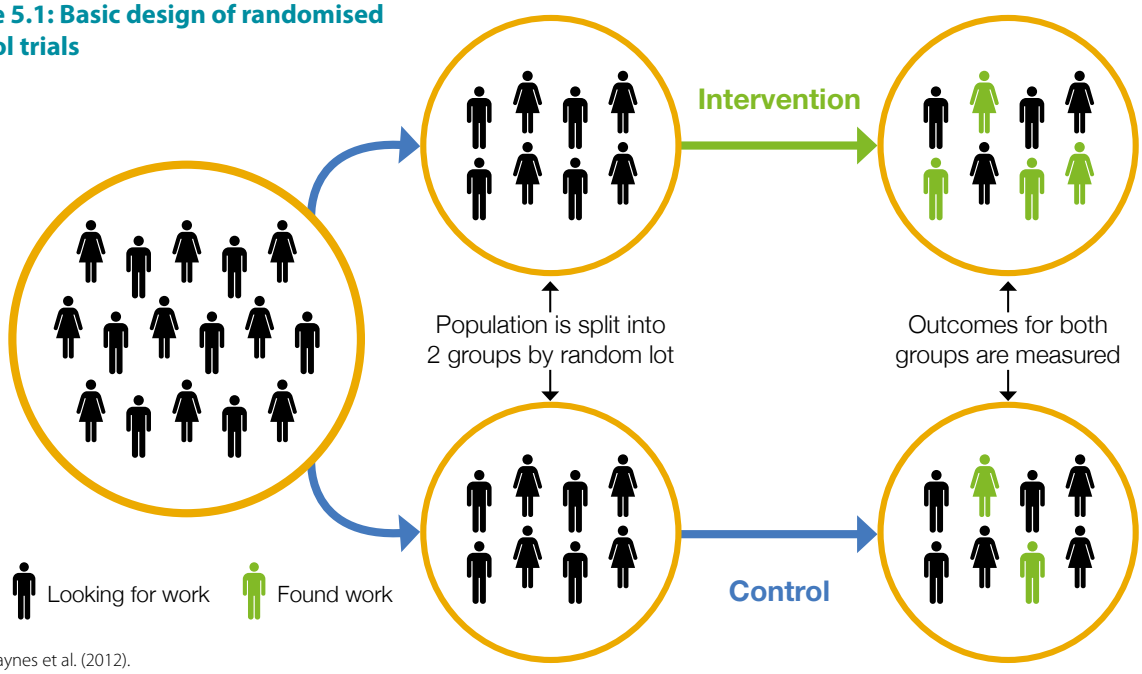
Experimental government: small bets with big potential

Government innovations come in all forms and sizes, and are as diverse as the challenges they address. To make innovative solutions possible, governments need to think differently. This requires that governments use existing tools and resources differently, and leverage new tools and approaches to rethink their work in order to generate new solutions for new or persistent problems.

As shown throughout this report, the potential benefits of innovation are bound only by the limits of human imagination and creativity. In the face of a changing and increasingly complex environment, public innovation leaders have been calling for experimental government to meet the policy challenges of today's world (Breckon, 2015; Mulgan, 2013; Sahni et al., 2013). To gather knowledge and evidence on what works or what could work better in a cost-efficient way, public authorities need to experiment and learn iteratively. The process of innovating means dealing with uncertainty; it means accepting that sometimes experiments do not work as expected, and that many, perhaps most, innovation efforts will fail. There is no such thing as risk-free innovation.

This should not discourage governments from trying out new opportunities, but it does mean that they should do it consciously, assessing the risks and developing strategies to manage them. Experimentation embodies that ideal. By testing and validating new ideas and solutions at a manageable scale before diffusing and scaling-up successful experiences, governments can persevere in exploring new solutions while minimising their costs. Experimentation allows governments to learn about alternatives, implementation

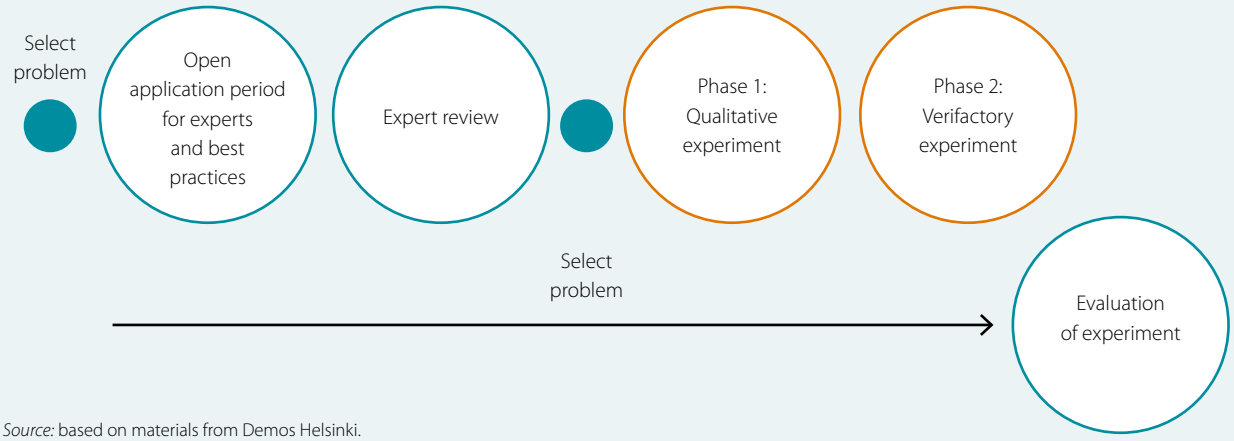
Figure 5.1: Basic design of randomised control trials



Source: Haynes et al. (2012).

DESIGN FOR GOVERNMENT: HUMAN-CENTRIC GOVERNANCE THROUGH EXPERIMENTS

The Prime Minister's Office in Finland has developed an experimentation platform for citizens in collaboration with the think tank Demos Helsinki. The objective is to crowdsource practical ideas for how to improve Finland, develop the ideas into experimental proposals and scale the proposals if successful. This form of connecting with citizens engages people by giving them a shared responsibility in the work and success of government.



Source: based on materials from Demos Helsinki.

and potential impacts or unintended consequences, and importantly, to learn from their failures. Moreover, the process of piloting and testing can also help leverage information from users or beneficiaries of the service or policy, but also empower them to be part of the solution. Testing is about engagement and co-creating solutions that are user-centred or user-driven.

Government experiments can use a wide variety of structures and tools to validate ideas. Public sectors increasingly use randomised control trials (RCTs) and other evaluation methods to assess the impact of public policies on a reduced sample of individuals, so as to help identify promising practices that could be expanded to larger groups.

Countries at the edge of innovation are structuring their governments to serve as innovation labs and incubators. The leading country in this field is Finland, where the government has launched an initiative to experiment with and study the impact of innovative service interventions (see box). Finland has just launched their first major experiment using this process: thousands of randomly selected unemployed citizens will receive a guaranteed basic income to replace their existing unemployment benefits to assess whether basic income can help reduce poverty, social exclusion and bureaucracy, while increasing the employment rate. The results of this and other experiments have the potential to comprehensively reform services in Finland, and this approach could be replicated around the world.

While experimentation on such a scale has the potential to deliver massive gains, the associated risks are just as large. Having a well-regulated system in place, as in Finland, helps to mitigate these risks. Finland is also developing an ethical code of conduct for conducting experiments in the public sector. Another way to avoid high-risk, high-stake scenarios is for governments to opt for more common small-scale experimentation to foster innovation and assess the potential of new tools. This is particularly true of cutting-edge technologies or tools of highly uncertain evolution. In this case, the public sector acts as a venture capitalist, placing small bets based on a hypothesis about what the future will and should look like, and using those bets to guide future action (Sahni et al., 2013). This implies that governments assume their creative role in shaping the future, but in ways that can contain the costs and mitigate risk. These small bets, when adequately structured, have the potential to increase the public sector's

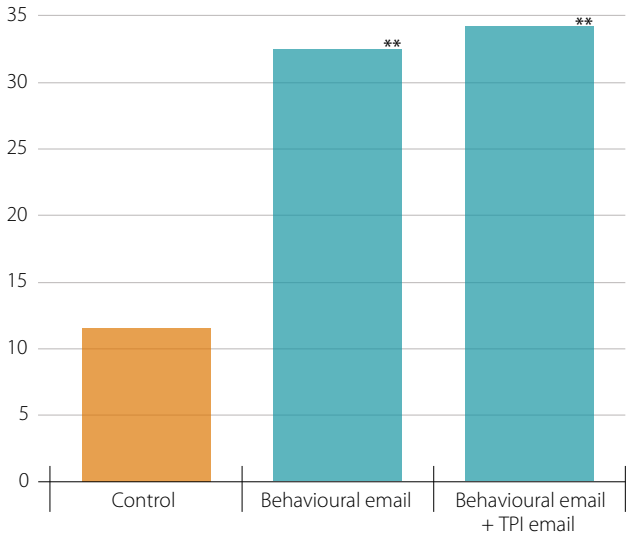
innovative potential. They can help government identify non-obvious solutions that make citizens' lives easier and improve public service performance. Sometimes, these efforts can be as simple as shifting incentives or providing timely information.

Countries growing innovation through small experiments are increasingly interested in the use of insights from behavioural sciences to inform policy and service design. The United Kingdom established the Behavioural Insights Team (BIT), also known as the *Nudge Unit*, to implement behavioural economics and psychology in government programmes, making them more efficient and effective. Subsequently, other governments, such as those of Australia and the United States, have set up their own nudge units as part of policy innovation efforts. The Netherlands is a world leader in the application of behavioural insights to government policy. At least ten public entities in the country are engaged in this practice, ranging from environment and infrastructure to consumer protections and financial markets. The Netherlands has used them to reduce road congestion and the complexity of financial products, and to improve procedural fairness and library readership.[56] These approaches have great potential to enhance effectiveness, often with little other action than reframing choices (Lunn, 2014).

The use of behavioural insights can be relevant for virtually all policy areas, ranging from tax administration to health care. For instance, the BIT in the United Kingdom tested a simple but powerful way to enhance tax declaration compliance in Costa Rica. Working with the Costa Rican Tax Authority and the World Bank, the BIT sent timely emails to firms, nudging them to file their declaration on time and in full. It selected a sample of firms that had failed to submit their tax declaration the previous year, and grouped the sample into three subsets: no emails, behavioural emails with deterrence message, and behavioural emails including samples of the firm's transactions obtained through third parties. This experiment resulted in a significant increase in tax declarations among the groups that received the email (see Figure 5.2).

Behavioural re-engineering not only has the potential

Figure 5.2: Rates of tax declaration under different email conditions



Note: N=12 515 ** p<0.01, * p<0.05, + p<0.1.

Source: Kettle and Ruda (2016).

to recuperate resources for government coffers, it can also save lives. In the health sector, blood is a scarce yet vital resource. Adequate blood management can imply a difference between life and death for a patient, and may determine whether a patient in need has access to much-needed blood. Behavioural techniques have been used to improve blood management in hospitals, as discussed in the box on the Edendale Hospital.

Governments are also betting on emerging technologies. The Austin Fire Department has partnered with the University of Texas and other academic institutions to implement the use of drones and robotics to assist in fighting wildfires, search and rescue activities, hazardous material mitigation, flood events and scene mapping among many others (Austin Fire Department, 2015).

Blockchain is another emerging technology that is being watched and tested for its implications in government. The Central Bank of Canada is currently developing a digital version of the Canadian dollar based on blockchain technology, known as CAD-coin.[57] The Bank has engaged with major national financial institutions to build a proof of concept for a new interbank payment system using a

56. *See https://ec.europa.eu/jrc/sites/jrcsh/files/jrc-biap2016-netherlands_en.pdf.*

57. See *www.forbes.com/sites/laurashin/2016/06/16/canada-has-been-experimenting-with-a-digital-fiat-currency-called-cad-coin.*

THE EDENDALE HOSPITAL: IMPROVING BLOOD MANAGEMENT EFFICIENCY

Amid a national blood shortage crisis, the Edendale Hospital in South Africa was considered one of the worst performers in terms of blood management efficiency. To tackle the crisis and its own under-performance in this area, hospital authorities at Edendale introduced a blood management protocol: an accountability form, auditing processes and video presentations to raise awareness of this sensitive issue. By making the problem visible and improving behaviours and accountability, the Edendale Hospital achieved outstanding results, which won it the South African Public Sector Innovation Award in the category of innovative service delivery (Centre for Public Service Innovation, 2015). This project helped to save 4 400 blood units and an estimated USD 1.05 million, proving that meaningful innovation does not necessarily require big investment or cutting-edge technology. Most importantly, it has helped to save human lives.

Source: Call for Innovations submission from the Edendale Hospital.

blockchain-based distributed ledger. While the outcomes of this experiment are yet to be seen, the Canadian Central Bank has embraced controlled experimentation as way to produce evidence and drive innovation in the financial sector (Shin, 2016).

Start-ups, civil society, civic tech activists and the private sector are also engaged in public sector innovation and experimentation. For example, the United States start-up LO3 Energy is in the early stages of launching the Brooklyn Microgrid[58] in New York City. This project will allow local residents to buy and sell energy from their own solar panels using the existing grid infrastructure and blockchain. This will enable power to be provided even if the larger grid goes down due to emergencies. Meanwhile, Democracy Earth, a civic tech foundation, has been piloting a blockchain-based solution for voting. Through the use of the blockchain distributed ledger, this civil society organisation is testing the idea of a voting system that allows for collective auditing of elections and public decision making with the ultimate goal of securing trust in public institutions (see also the following case study in Colombia). Although not strictly government initiatives in their own right, these examples touch on services often provided by governments, and may have lessons to share or potential implications for how governments meet their objectives.

While small in scale, if successful, these experiments have the potential to drastically change economic models, as well as the effectiveness, efficiency and sustainability of public services. Experimental government is about shaping the future of government, *with evidence*.

Challenges

The challenges associated with fostering an experimental government are largely cultural, or involve determining when experimentation is the right approach:

Developing a culture of creative experimentation is difficult. Creating an effective culture, where risk is tolerated, and creativity, problem solving and experimentation are encouraged, is easier said than done. Administrative systems are often designed to preserve the institutional structure of the state, stabilise its procedures, ensure accountability for the use of public resources and secure returns on its investments. Fostering a culture of innovation and experimentation means attracting and combining skill sets effectively, and motivating innovators through tangible and intangible incentives (OECD, 2015). The perception of narrow space for failure may lead leaders to develop excessively risk-averse behaviour, and become reluctant to change. Moreover, innovative experiments may sometimes attract unwelcome scrutiny. The literature shows that higher scrutiny and perceived risk often translate into risk avoidance (Bhatta, 2003), which may lead to lost opportunities.

Determining the appropriateness of innovation and determining next steps is complicated. Certain interventions cannot be assessed feasibly through experimentation, and in some cases, experimentation does not clearly inform replicability. Experiments are better suited to test straightforward interventions and do not always facilitate the isolation of variables in complex scenarios (Whitmore, 2012). Questions about ethics may also make experimentation difficult or inappropriate, as government experiments can result in one group receiving services

58. See http://brooklynmicrogrid.com

while others do not. In addition, complex experiments are not only hard to measure to determine success, but can also be costly (Hirschon Weiss and Birckmayer, 2008). Finally, the results of experiments can be context-specific and are not always easily replicated in other places or situations. Determining the appropriate form of experimentation and the correct method to scale the results requires skill and a calculated approach.

Contributing factors

Strong judgement capabilities enable successful experimentation. Research shows that innovative potential is not fundamentally about taking or avoiding the risks associated with trying out new solutions, but about taking calculated risks (Accenture, 2015; Samson and Gloet, 2013). A number of countries are developing more structured approaches to both innovation and experimentation. Sound prototyping and testing enables managers to identify weaknesses in ideas, make measured investments and shorten the learning curve. Small-scale investments should allow the public sector to develop relatively inexpensive experiences and learn from them. However, a strong civil service is needed to calculate when experimentation is worth the risk, and judge the success and scalability of new initiatives. Having such capabilities also helps build confidence in the workforce, which can have positive effects on cultural willingness to experiment. Such judgement is needed before and after an experiment takes place, with the first decision being to determine whether experimentation is appropriate. Making decisions about what constitutes success ahead of the experiment can also help to mitigate after-the-fact challenges and future changes in the political climate. Finally, good judgement is necessary in order to gauge the success of the experiment, determine the process for future iterations and assess the extent to which its results warrant scaling the practice to other environments. An emphasis on developing the skills and capabilities necessary to carry out these demands can position governments for success.

Sandboxes for experimentation help. Governments are increasingly establishing innovation labs, as discussed in Trend 2, to pilot and test different alternatives and produce robust evidence on the feasibility of specific innovations at a large scale. Innovation labs are specially conceived to identify key challenges, develop ideas to tackle them, design robust experiments and testing protocols, learn from the results and diffuse solutions (Nesta, 2014). While these are not the only option, research undertaken for this report has shown that the most innovative governments created innovative spaces such as labs to help experiments get off the ground.

Direction from leadership directs culture. Countries that seek to build an experimental government also need the political space to do so. As has long been known, political support is crucial to the innovation process in the public sector (Grady and Chi, 1994), underlining the need to raise awareness of political leadership and make failure acceptable. Strategic management of communications is essential, and countries that have excelled in innovation have continuously emphasised the importance of innovation from the highest levels of government.

Working with the public. Experiments can often affect the lives of citizens, such as in the case of the basic income experiment in Finland. Governments that engage with the public in designing these experiments can help to mitigate potential negative effects and allow citizens in the opportunity to participate.

Recommendations

The following recommendations can help governments innovate through experimenting with new techniques and technologies that have the potential for big impact:

1. **Provide empowerment and space for innovation and experimentation.**
   Governments leaders that consistently express innovation as a priority empower and provide "top cover" to civil servants and programme officials to experiment and take risks. In the absence of such supportive environments, the risk-averse tendencies of government can discourage employees from experimenting. Explicit acceptance of calculated failures can help, as can dedicated places that prioritise experimentation, such as labs or transformation teams (see Trend 2).

2. **Ensure the system is flexible.**
   Avoid legal and regulatory frameworks that are overly rigid. Create an overarching governance framework for public sector activities that supports innovation. Leading countries in innovation, such as Finland, have gone even further by implementing frameworks that actively support and facilitate innovative practices. These can be seen as the gold standard for other countries.

3. **Build the institutional infrastructure to scale-up successes.**
   Innovators and successful experiments may require funding and adequate channels to diffuse and scale-up their successes and lessons for their peers, as discussed in Trend 2. In addition, the existence of learning and innovation networks can help the public sector shorten the learning curve and overcome bureaucratic barriers. This can also include ways to aggregate and analyse evidence from experiments so they can be leveraged by others, as can be seen in the case study on Denmark's *Spreading Innovation* guide in Trend 6. Absence of infrastructure for innovation to develop and spread, once determined successful, diminishes the value of the time spent and discourages employees from future experimentation.

4. **Consider ethics protocols for experimentation.**
   To avoid ethical dilemmas, governments should consider ethical protocols to help guide decisions around experiment design, and create a framework for acting on potential issues when they arise. These protocols should include transparency to ensure awareness among the affected subjects. Those affected by the experiment should be full informed of their status and how the process may differ from traditional practices. They should also be able to provide feedback and file complaints if they experience negative consequences.

CASE STUDY

Blockchain Voting for Peace – Colombia

SUMMARY

In order to give Colombian expatriates a voice in a 2016 Peace plebiscite[59] and test the potential of Blockchain technology in electoral processes, the tech non-profit Democracy Earth Foundation set up a digital process that allowed Colombian expats, who were unable to vote through the official process, an opportunity to participate in a plebiscite on whether to approve a peace treaty. This process raised interesting questions for governments about the future use of blockchain in electoral processes, and in the public sector more broadly, and could potentially lead to new ways to ensure the integrity of the election process.

59. A plebiscite is a vote to express an opinion on a choice to be made by government.

THE PROBLEM

"Regrettably, the registration of ballots will not be reopened" (*El Tiempo*, 2016).[60]

These words spoken by the National Civil Registrar of Colombia significantly limited the ability of Colombians living abroad to vote in the historic plebiscite on the peace treaty between the Colombian Government and FARC, held on 2 October 2016. Only 599 026 of the 6 million[61] Colombians living abroad had the right to vote at the consulate of their countries of residence, because they voted there during previous elections. An innovative solution was needed to give more foreign-based Colombians a voice and to challenge the traditional electoral system.

AN INNOVATIVE SOLUTION

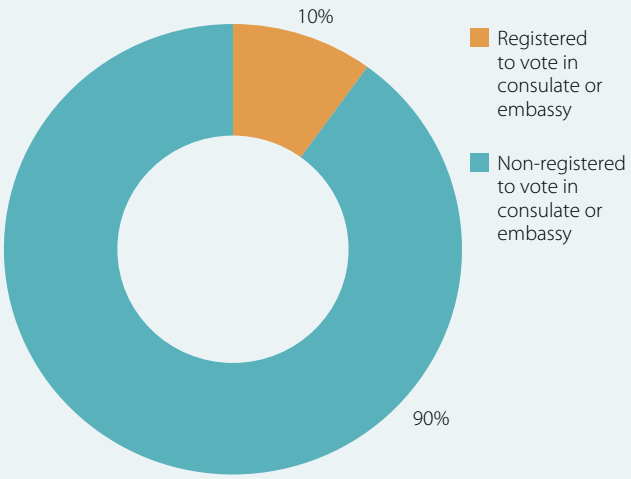
Against this background, the tech non-profit Democracy Earth Foundation launched the digital voting platform *Plebiscito Digital* (Digital Plebiscite),[62] and worked with several civil society organisations to allow Colombians abroad to cast symbolic votes through the platform. The Digital Plebiscite was powered by blockchain technology, testing a new way of validating and authenticating electoral votes.

60. Author's translation of "lamentablemente no se abrirá la inscripción de cédulas".

61. This is the official estimate of the Colombian government. Democracy Earth gives a number of 7 million on its website.

62. See *http://plebiscitodigital.co.*

Figure 5.3: Registration of Colombian voters abroad for the 2016 plebiscite

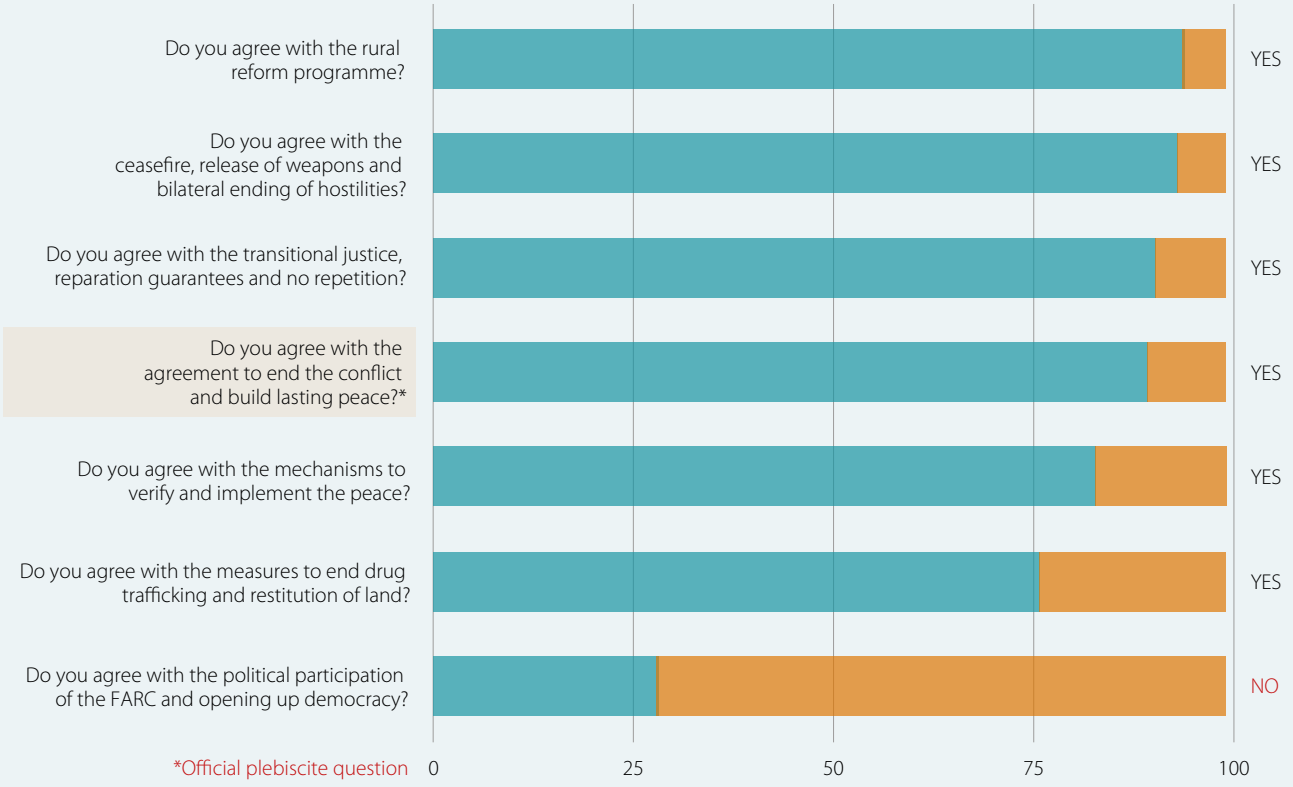


Source: Author's elaboration based on data from the Colombian National Civil Registry.

Blockchain is a database that enables the transfer of value within computer networks. This technology is expected to disrupt several markets by ensuring trustworthy transactions, such as casting votes or sending money, without the necessity of a third party (i.e. a public electoral authority). It acts as an open, shared and trusted public ledger that is transparent and cannot be tampered with (OECD, 2016c). Blockchain's first core use was for Bitcoin, a digital currency not regulated by any central bank that, as of January 2017, has the equivalent of over USD 16 billion in circulation throughout the world.[63]

63. See *https://blockchain.info/charts.*

Figure 5.4: Digital Public Innovation in Colombia



Source: Democracy Earth Foundation.

Besides testing the blockchain authentication process in a voting context, Democracy Earth also wanted to experiment with a different concept of democracy: liquid democracy. Instead of giving citizens the choice between voting "Yes" or "No" to support the peace treaty, each voter could vote on sub-themes of the proposed peace treaty and indicate the relative importance of each one. According to Democracy Earth, "This approach allowed us to identify the deal breaker in the peace treaty", pointing to the overwhelming "No" among pilot participants to one particular statement of the treaty (see Figure 5.4).[64]

NOVELTY

According to the Colombian Ministry of Information and Communications Technologies (MinTIC), "Blockchain is an expression of the current trend towards a new kind of collaboration, in this case jointly generated security". In the current climate of questioning the integrity of election processes, the potential of blockchain technology to radically change traditional voting systems is enormous, because "There's no more secure technology than Blockchain […] it has already successfully endured several attacks" (OECD, 2016b). As such, governments may come to realise that the security and integrity of electoral processes is not just a matter for state control, but also an area that can be guaranteed collectively, supported by blockchain. Such developments would also have consequences for the accountability mechanisms concerning voting procedures and results.

IMPACT AND RESULTS

The pilot has launched a discussion in the Colombian media about the potential of blockchain technology for voting and the value of the concept of liquid democracy. Additionally, the initiative has been adopted by "The Net Party" (Partido de la Red Colombia), which is now promoting the idea of blockchain voting through social media. In addition, the Centre for Digital Public Innovation (CDPI) of the Colombian Government is looking into the potential of blockchain, which it heard about in the context of this review.

64. See *https://medium.com/@DemocracyEarth/a-digital-referendum-for-colombias-diaspora-aeef071ec014#.dr2rt44vh* for more information on results.

REPLICABILITY

Blockchain could disrupt voting, just as it has currency, and could apply to any democratic government. In Colombia, CDPI supports digital innovation activities by a broad range of societal actors, as long as these are focused on public value creation. It emphasises that success stories are vital for Blockchain technology to receive political support, budget and traction in the Colombian public sector. In this regard, the role of innovative, non-risk aversive public institutions is of key importance. Another innovation strategy would be to leverage private sector and academic expertise to develop new Blockchain solutions in the public sector.

CHALLENGES AND LESSONS LEARNED

According to Democracy Earth, the involvement of stakeholder organisations abroad was critical for the success of the pilot project. Had these organisations not leveraged their respective networks to reach out and encourage Colombian voters to participate in the project, it would have proven considerably more complicated to test the developed technology.

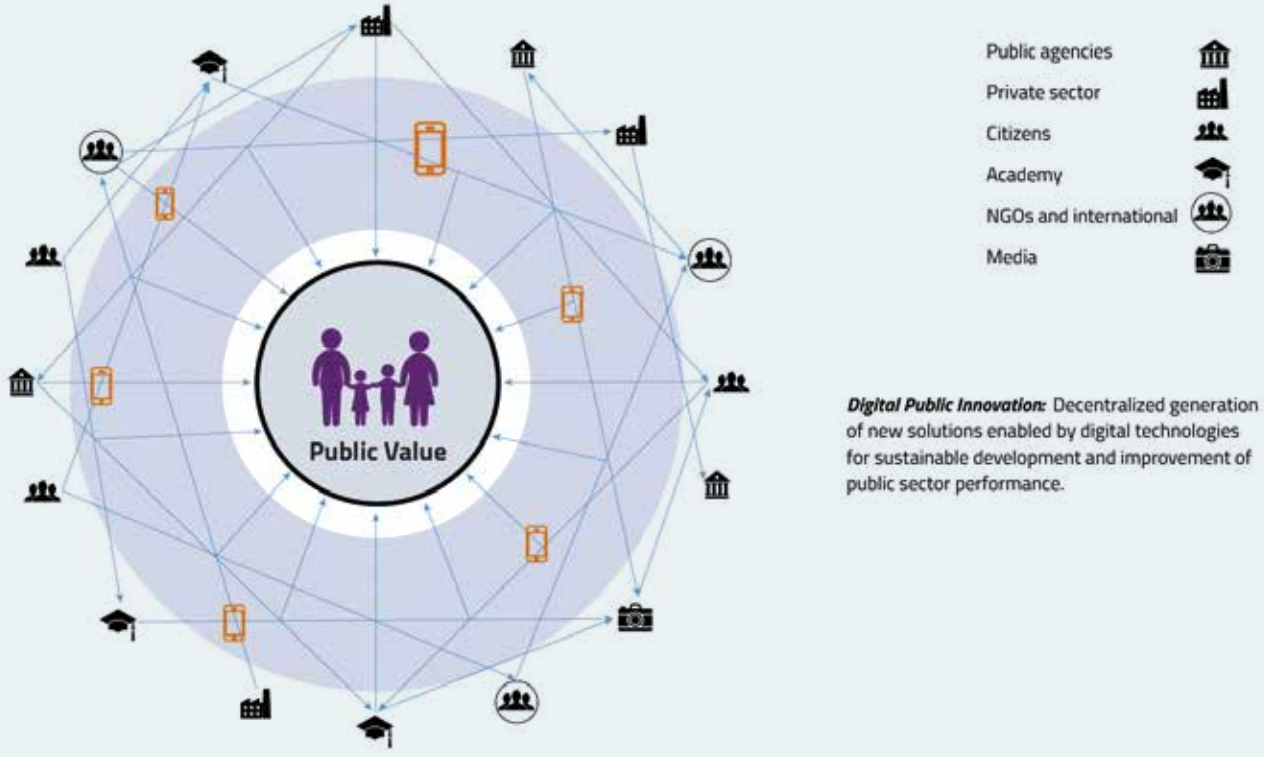
Both the CDPI and Democracy Earth acknowledge that there is a long way to go before Blockchain voting can become a reality in Colombia, and it will be some time before it can be deployed officially in other countries as well. However, this example shows how a small experiment can point the way towards major potential future changes.

The main identified challenges were the:

- lack of sufficient maturity of blockchain technology;
- broadband access and digital user skills;[65]
- regulatory barriers regarding "data as jurisdiction";
- resistance from political leaders who benefit from the status-quo;
- cultural resistance in public organisations.

65. 23.2 million Colombians, nearly half of the total population, are still offline (OECD/IDB, 2016d).

Figure 5.5: Digital Public Innovation in Colombia



Source: Centre for Digital Public Innovation, Ministry of Information and Communications Technology, Colombia.

Trend 6

Breaking the norms: rethinking the machinery of government

Great innovations are often the products themselves of innovations in production and process. The final product is made possible by new materials, new production technologies, and new ways of organising work and people. This is also true for government services, where the innovative end product, whether new digital services, new approaches to preventative health care or programmes to address homelessness, are made possible by adjusting the internal mechanisms of government in ways that enable innovation. This trend looks at two key ingredients of innovation that underscore every project in this report: people and money.

People are at the core of public sector innovation. Ideas for new services and business activities are sparked in the minds of civil servants, political leaders, service users and members of the broader community, and are developed and brought to scale through the dedication of many and various professionals and stakeholders at different stages of the process. Civil servants are central at every stage, and therefore the management of government employees comes into focus, both as an enabler of innovation in the public sector, but also a component to be innovated.

If the public workforce functions as the brains of public sector innovation, funding and financing mechanisms provide the blood. Even simple innovations need access to some level of funding and financial support to make their way from idea to reality. The availability and nature of this financing can determine the eventual success of the innovation. As with people above, the way money flows through government and from government to innovation partners enables innovation and is itself the object of innovation.

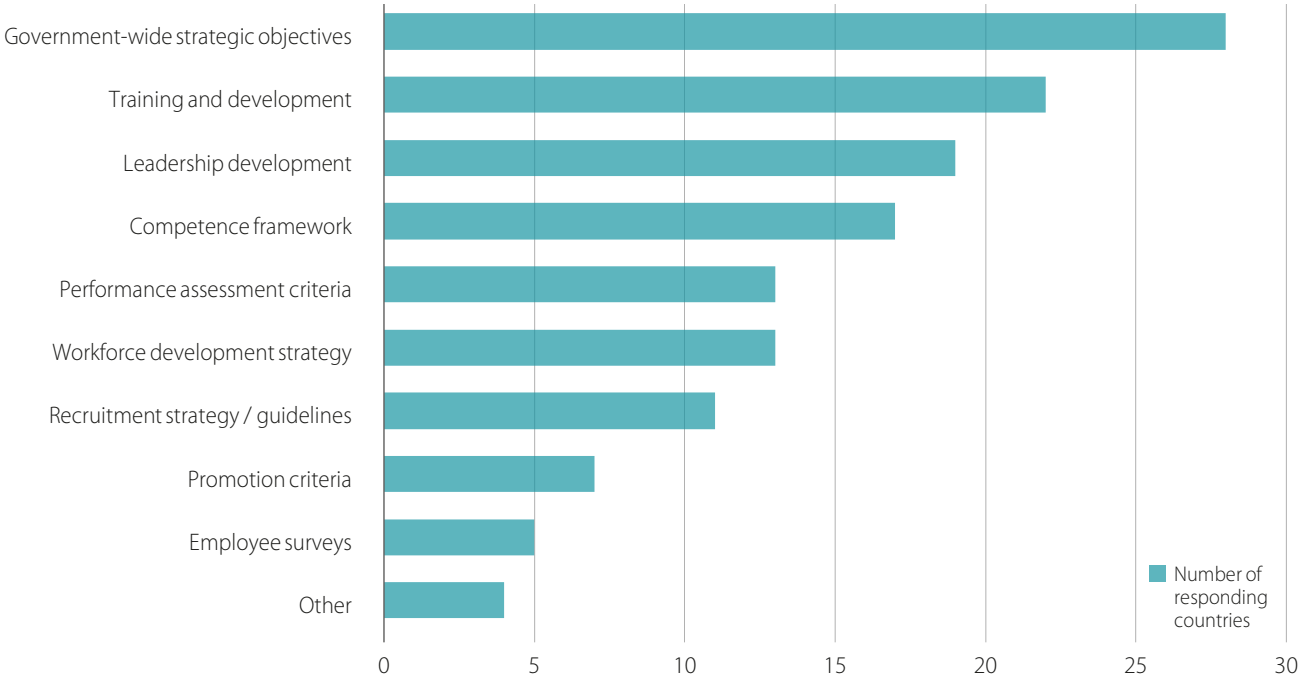
BUILDING A WORKFORCE OF PUBLIC SECTOR INNOVATORS

Public sector innovation by definition cannot be an outside job. Even where solutions come from the outside, public employees working across government are required to have the skills, motivations and mind-sets needed to drive innovation in their organisations. This means not only looking at the profiles of these employees, but at the way in which they are managed and given the opportunities they require to come up with ideas, test them and bring innovations to scale. Governments across the OECD are prioritising public sector innovation as an important element of their human resources management (HRM) reforms, and have begun including the concept in their core people management processes (see Figure 6.1 and Appendix III). This sub-section looks at three innovation trends with the potential to build and manage a workforce of public innovators: the use of people analytics to better manage the workforce, breaking down silos to enable the cross fertilisation of ideas, and approaches to develop new and varied skills sets of innovators in public sector organisations.

Strategic data-driven people analytics to drive insights and forecast the future

The digital revolution is driving change in all aspects of government operations, and people management is no exception. Governments on the cutting edge of innovation are increasingly employing high-powered data analytics to better understand the attributes of their workforce, and to forecast the future. This provides a better understanding of decisions that need to be taken today to ensure that governments have the necessary workforce capacity to perform in the future.

Figure 6.1: Placement of public sector innovation in survey countries



Source: Preliminary results from OECD (2016b).

For example, the United States Department of Defence, one of the largest organisations in the world, is launching a new Office of People Analytics to conduct a comprehensive analysis on how policy or environmental changes will affect the performance or composition of the workforce. The Office is designed to provide direct analytic support to the Military Services and the Office of the Secretary of Defence, so as to inform better personnel policies.[66] This approach has the potential to raise the department's performance by improving all aspects of HRM in ways that attract and retain top talent, and improve talent-based assignment matching.

In Mexico, the Ministry of Energy is using a predictive workforce planning and analytics model to identify current and future talent and skills gaps in critical oil and gas occupations over a ten-year horizon. The model leverages a number of adjustable macroeconomic variables such as oil price and exchange rates that correlate strongly to the demand and supply of skilled labour. Based on an understanding of these gaps in critical skills, the Ministry is able to work proactively with multiple stakeholders to address them.

Employee surveys are also being used to develop an evidence base that measures and compares employee's perceptions of their work, their organisation and their leadership. These surveys can measure and benchmark employee engagement – a concept that includes an employee's willingness and ability to invest themselves and their work in their organisation's goals.[67] Engaged employees are critical for high-performing organisations, as organisations with high levels of employee engagement produce better outcomes. Employee engagement has also been empirically linked to individual performance and employee retention, achievement of organisational objectives, productivity and innovation.

The United Kingdom uses the data from its Civil Service People Survey to benchmark organisations' performance, inform management decision making, and help set reform priorities and strategies. In the United States, the Partnership for Public Service uses the Office for Personnel Management's Employee Viewpoints Survey to benchmark employees' perceptions about innovation in their organisations and rank the best places to work in the

66. See *www.defense.gov/Portals/1/features/2015/0315_force-of-the-future/documents/FotF_Fact_Sheet_-_FINAL_11.18.pdf.*

67. For more on employee engagement in governments, see OECD (2016), *Engaging Public Employees for a High-Performing Civil Service*, OECD Publishing, Paris, *www.oecd-ilibrary.org/governance/engaging-public-employees-for-a-high-performing-civil-service_9789264267190-en.*

Federal Government.[68] The use of such surveys provides powerful data to support a more evidence-based view of organisational health, leadership, HRM and innovation-oriented organisational culture.

Recent OECD research suggests that the use of data analytics and employee surveys to better manage the workforce is on the rise, but remains the exception to the rule. For example, most central governments collect and centralise data related to basic workforce characteristics (e.g. gender, age, contract type), but fewer centralise data that describe behaviours in the workplace, such as the use of training, flexible working arrangements, mobility, turnover and dismissal. While most OECD countries conduct employee surveys, few do it in regular ways that enable a full range of benchmarking. Furthermore, while countries have begun collecting this data, not all use them to their full potential. Most countries produce annual public reports on the size and demographics of their central workforces, but fewer systematically integrate these data into decision-making processes, and even fewer use them to predict the future.

Cross fertilising across the sectors: breaking down the silos

Civil servants are organised into ministries and institutions segmented among policy fields that do not match the reality of the public policy challenges they face. Few if any of the big policy challenges of today sit comfortably within one ministry, but are instead multidimensional and complex, requiring innovation that takes into account a range of policy fields and is able to synthesise experience from multiple stakeholders. This means breaking down silos between ministries and across sectors, and giving employee opportunities to work in multidisciplinary groups to address these big challenges.

Slovenia's "Partnership for Change"[69] represents an innovative practice, based on building a strong partnership between the business sector and public administration. The main objectives are to overcome the gap between these two worlds, enhance understanding about the different goals and views, establish knowledge transfer between organisations and build a strong partnership for addressing common challenges.

Many OECD countries approach this challenge by developing networks to link innovative civil servants across ministries (see Figures 6.2 and 6.3). Finland has developed a Government Change Agent Network, which functions as a self-directing team of experts from different ministries, with different backgrounds, education and expertise. All participants recognise the need to construct a working culture based on a "whole of government" mind-set and a "crossing the silos" method of working. In practice, this approach is being implemented through common discussions, supporting and launching new initiatives, writing blogs, giving expert statements and starting new experiments, as well as jointly supporting and integrating innovative.

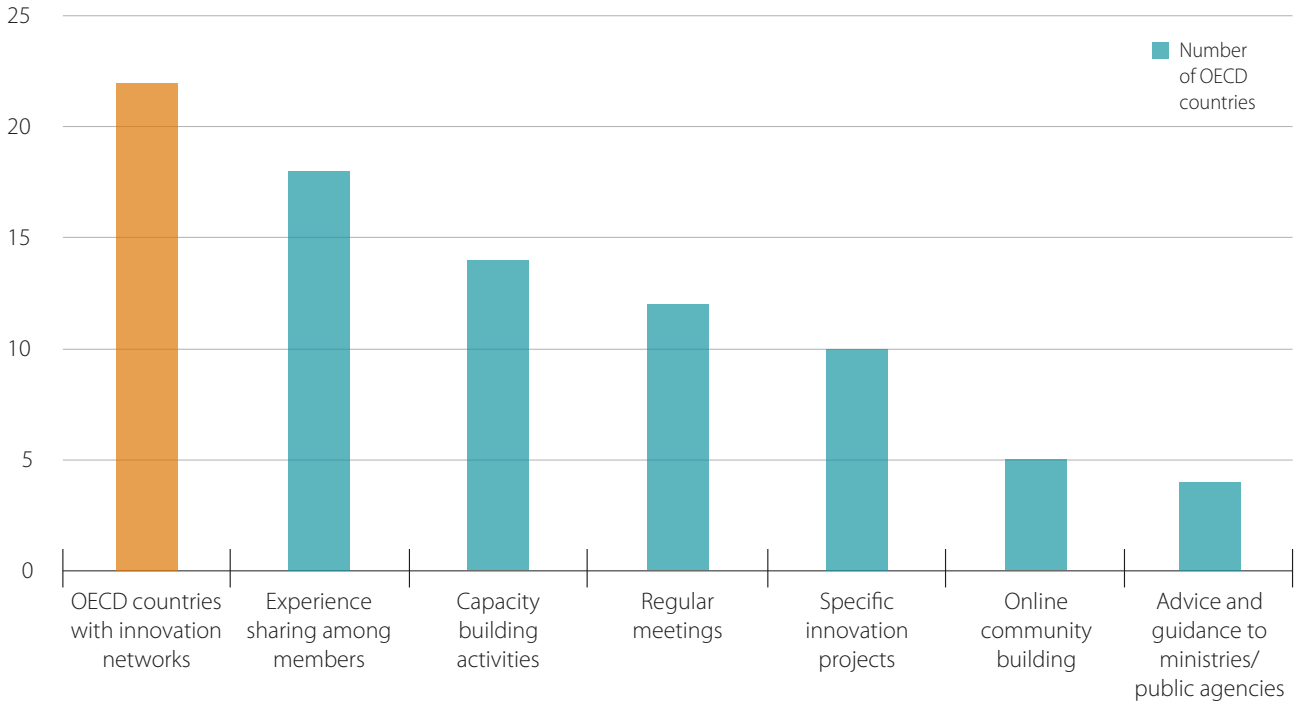
Denmark's *Spreading Innovation* initiative, discussed in the following case study and featured in the *Edge of Government* exhibit, addresses this issue by providing guidance, tools and even incentives to help spread innovative ideas from one organisation to another through learning and dialogue among civil servants. This includes a guide, freely available online, that provides a simplified overview of the innovation process, the actions of individual stakeholders and a series of dialogue tools that can support cooperation on adapting innovation to a new context. The guide makes it more manageable for public sector workplaces to work systematically with the spread of innovation. However, this type of innovation-oriented peer learning appears to be underutilised in governments. The recent OECD 2016 SHRM survey shows that many countries are employing these methods to some extent, but only a few have reached a point where peers are learning from one other to a significant degree. The rest report no use of innovation-oriented peer learning or were unable to confirm either way, which may illustrate some fragmentation within government.

Some governments have also set up policy laboratories, as discussed in Trend 2 of this report, where civil servants mix with each other, citizens and entrepreneurs to address policy problems and inspire each other to develop novel solutions. For example, the United States Office of Personnel Management's lab brought together a range of stakeholders to redesign the application for the National School Lunch

68. See *http://bestplacestowork.org.*

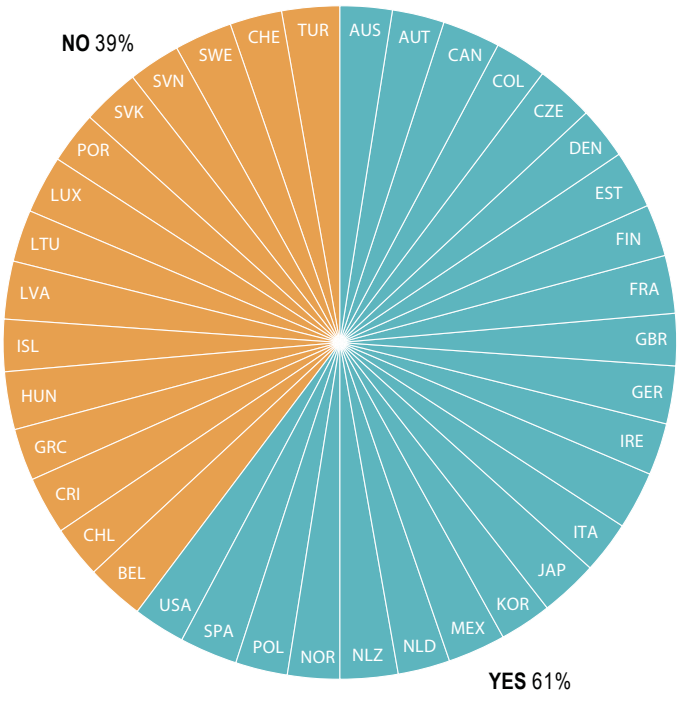
69. http://www.amcham.si/en/partnership-for-change.html

Figure 6.2: Use of innovation oriented networks in the civil service



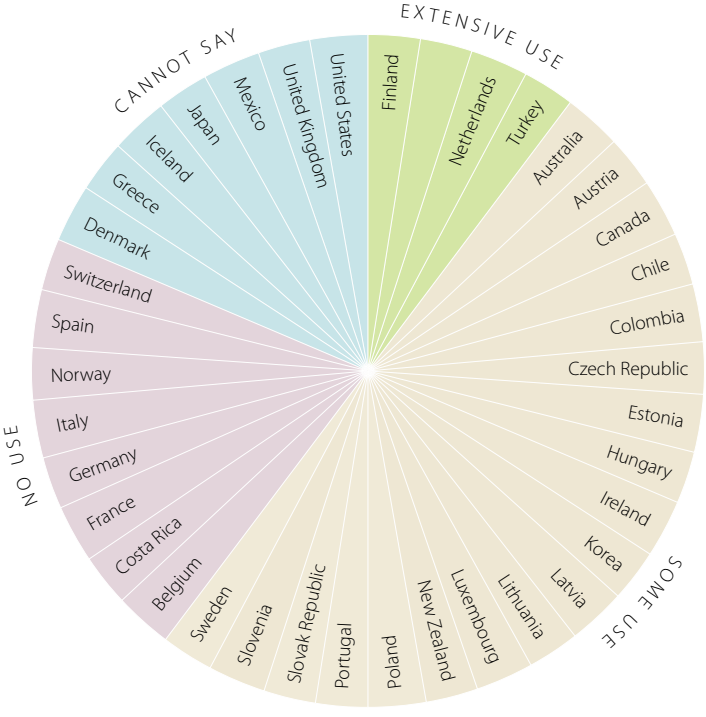
Source: Preliminary results from OECD (2016b).

Figure 6.3: Countries with innovation oriented networks in the civil service



Source: Preliminary results from OECD (2016b).

Figure 6.4: Use of innovation oriented peer learning in the civil service (e.g. mentoring, learning circles, etc.)



Source: Preliminary results from OECD (2016b).

Programme, launched online in November 2016.[70] This produced tangible improvements to citizens' experiences, saving taxpayer money and most importantly ensuring that children have access to nutritious meals through the school lunch programme. Meanwhile, the Laboratorio de Gobierno in Chile brings together government officials, universities and entrepreneurs to work together to develop innovation that will have a lasting impact on Chile's public services, including health, energy and disaster preparedness.

A focus on skills empowers public servants as innovators

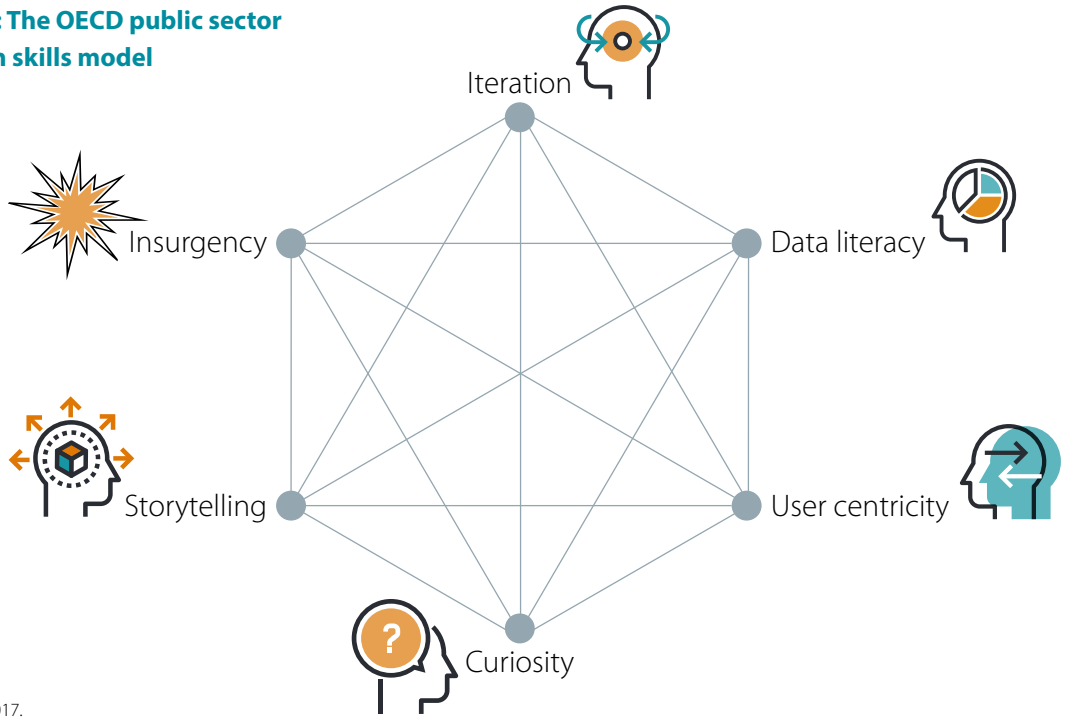
The mission of the United States Office of Personnel Management and Chilean public innovation labs is not only to help public employees find innovative solutions to their public policy problems, but also to contribute to skilling-up public employees' own innovation skills. Many public sectors are asking themselves what kind of public organisations and public servants are required to meet the innovation challenge. They are also trying to establish how their work is changing, and what kind of civil servants and public employees, and with which skills profiles, will be required to work in and lead these organisations. The OECD is working with public managers and innovators across the world to better understand these questions, and has developed a skills model that highlights six fundamental skills categories for innovation in the public sector (OECD, 2017).

The skills model is based around six "core" skills areas. Not all public servants will need to make use of or apply these skills in their day-to-day job. However, all officials working in a modern twenty-first century public service need to be at least aware of these core skills, in order to support increased levels of innovation in the public sector:

- **Iteration:** incrementally and experimentally developing policies, products and services.
- **Data literacy:** ensuring decisions are data-driven and that data are not an afterthought.
- **User centricity:** ensuring that public services are focused on solving and servicing user needs.
- **Curiosity:** seeking out and trying new ideas or ways of working.
- **Storytelling:** explaining change in a way that builds support.
- **Insurgency:** challenging the status quo and working with unusual partners.

70. *www.fns.usda.gov/school-meals/web-based-prototype-application.*

Figure 6.5: The OECD public sector innovation skills model



Source: OECD, 2017.

These six skills areas are not the only skills for public sector innovation. Each innovation project and challenge will have its own particular needs. Rather, these are skills areas that with proper promotion/advocacy and development can enable a wider adoption of innovation practices and thus an increased level of innovation.

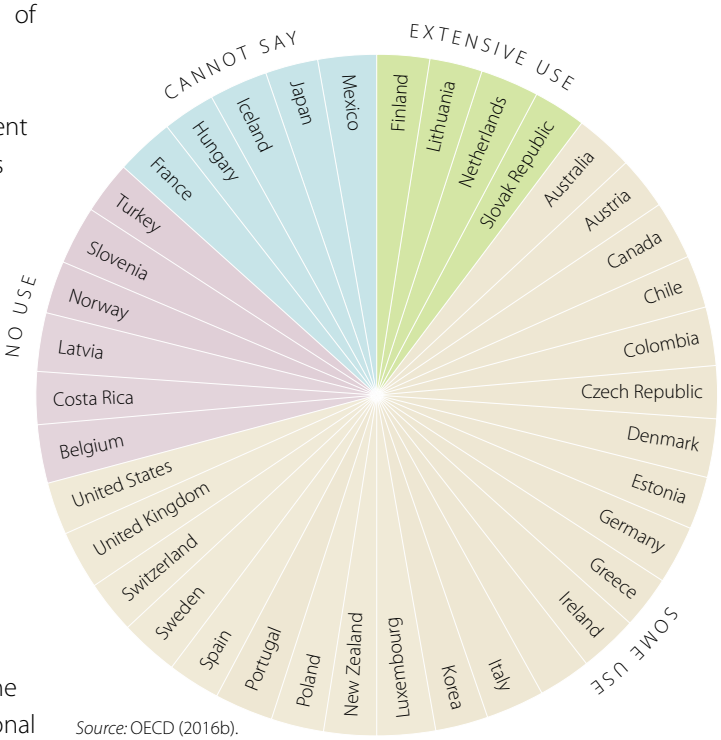
Embedding these skills in the public workforce requires taking a new look at recruitment and training mechanisms, as well as management approaches, to ensure that people with these skills are given the right opportunities to put them to use. Portugal has taken an innovative approach to learning for the employees of its Citizen's Shops and Citizen's Spots (managers, coordinators, and public servants). This learning initiative considers new forms of participation and achievement through innovative learning methodologies, with a strong focus on the use of new information and communication technologies and training models in eLearning. The initiative introduced new ways of learning, sharing knowledge and creating new knowledge though discussion forums and communities of practice. Employees have the possibility to access knowledge anytime and anywhere, and to receive updates that enable them to be more open to innovations and change. This initiative helped to create a learning community within the Citizen's Shops and Citizen's Spots network. It brought new opportunities for dissemination and increased the involvement of employees and public and private organisations.

Similarly, São Paulo's Agents of Open Government programme, profiled in a case study earlier in this report, harnesses the collective wisdom of a highly developed civil society, in order to teach civil servants and others cutting-edge approaches, while simultaneously bringing them closer to the citizens they serve. This model allows civil servants to learn new techniques, such as open source software development, community-mapping techniques, and communication and social media tools, which enable them to do their jobs more effectively. At the same time, civil servants are interacting with a variety of actors in the private, academic and civil society sectors, sparking their curiosity, and getting to know their users in ways that were previously impossible. The results of this programme have cost a fraction of the price often spent on traditional courses from consultants.

Building public organisations that attract and retain innovators will require looking at all aspects of public HRM from employer branding strategies to recruitment and selection processes, career development and pay systems. The Government of Chile has recently shown leadership in this area by working with OECD to develop the first in-depth study of public HRM from an innovation capabilities perspective. The project has worked with over 200 public employees in Chile through interviews and workshops, and has developed actionable recommendations related to people management, innovation skills development and public leadership in the Chilean context.

While these skills are important enablers for all government innovators, OECD research indicates that countries may want to focus some effort on building up skills for innovation *leaders*. Most respondents to the SHRM survey reported some training to support public servants in leading transformational projects and initiatives, but very few had received an extensive level of training (see Figure 6.6).

Figure 6.6: Use of training to support public servants in leading transformational projects and initiatives



Source: OECD (2016b).

FUNDING, FINANCING AND BUYING INNOVATION: ALIGNING MONEY TO IDEAS

The size of government budgets has enormous potential to mobilise money in ways that support public innovation. Governments on the cutting edge are increasingly exploring financial mechanisms that improve their investments in innovation, whether inside or outside government. This sub-section looks at four trends reshaping the way money flows through government and beyond to government partners. The first looks at the use of budgetary incentives to encourage and fund innovation within government. The second examines how governments fund and finance social innovation partnerships. The third explores ways to improve how governments innovate through better procurement and acquisitions. Finally, the fourth discusses how governments are moving from reactive funding to more innovative proactive models.

Innovation funds to support innovation projects inside government

The recognition that innovation requires resources has driven some countries to set aside special innovation funds in their budget. For example, the Danish Ministry of Finance allocated EUR 16 million to a fund for public sector efficiency, which was awarded on a competitive basis to promote the scaling up of innovation pilots. There were 50 to 100 projects with a focus on saving EUR 2-6 million. Projects included support for digitisation and information technology investments at regional and local government. A new Centre for Public Sector Innovation was also established with funding to share best practices and harvest successful innovations across regions.

France created the General Secretariat for the Modernisation of Public Action (SGMAP) as an institutional anchor for public sector innovation. SGMAP has managed to invest over EUR 176 million so far through its Future Investment Programme, which is aimed at innovators within the public sector. The goal is to stimulate innovative projects that can serve as prototypes to be scaled up for broader implementation. Formal calls for proposals are issued, with support for reviews performed by experts in the relevant fields. Supported areas include the digitisation of public services, the development of open data exchanges, streamlining of the interface between agencies and their clientele, and strengthening of capacities for experimentation.[71]

In the case of one programme across a group of hospitals, collective wait times at emergency departments were reduced by an average of 20% (McKinsey and Company, 2011: 19). Innovation funds can also come from outside government to catalyse public sector ideas. For example, the Bloomberg Mayors Challenge held competitions that resulted in the genesis of The Wellbeing Project and Virtual Warsaw, as discussed in Trend 4.

Overall, innovation funds have provided incentives for innovation in government agencies. However, officials indicate that the promise of these vehicles as a way to tap innovation is contingent on several important factors. First, the agency needs some level of flexibility to use new resources in areas that provide the greatest potential for innovation. Governments that have delegated greater spending powers to agencies may be expected to reap more results from innovation funds than other countries. However, excessive fragmentation may reinforce silos and lead to the risk of small agencies lagging behind and seeing their capacity to innovate severely reduced. In addition, new delivery approaches and projects require funding certainty over time, and agencies will be
reluctant to institute new arrangements if they do not know whether they will receive stable funding in the future.

Innovative funding is fostering innovation in communities

While innovation funds can be a powerful support mechanism for innovation within government organisations, the ways in which governments fund projects at the cutting edge and on the border between government and the community also has a significant impact. The ways that governments structure funding to community organisations and private service delivery partners is increasingly assessed through an innovation lens, so as to determine what kinds of funding tools make sense, and how these can be organised to support innovation while meeting the required level of accountability and

71. See *www.modernisation.gouv.fr.*

transparency.

The Canadian province of Nova Scotia has experimented with a more participatory approach to funding community projects by engaging with their Indigenous community (Mi'kmaq) in grant programme development and funding decisions. The province recognised that this community faced barriers in accessing offered funding programmes, in part because of the design of the programme. Not unlike Indigenous peoples across the world, the Mi'kmaq of Nova Scotia want self-determination, including the preservation and control of their cultural traditions, practices and promotion. The Government of Nova Scotia took the step of involving the Mi'kmaq community throughout the design phase of the grant programme, recognising that the community was best positioned to identify their cultural preservation and development needs. This represented a significant step in breaking down barriers and supporting self-determination and governance.

Another trend in this area relates to Social Finance – the use of a range of public and private financing mechanisms for innovation with a social purpose. One example proving successful is the Social Impact Bond (SIB), a payment-for-results tool in which private investors fund an innovative approach that has potential to address a social need of interest to a government agency (Dear et al., 2016). If the investors achieve an agreed-upon goal, the government refunds their investment, including a premium for the risk taken. If the intervention is unsuccessful, then the government pays nothing. The United Kingdom's ongoing experimentation with SIBs began as a six-year pilot to establish whether the tool would help address rehabilitation programmes for male offenders at Peterborough prison. The tool has helped reduce re-offenses by over 8%, and the programme has been rolled out nationwide. There are now 14 SIB active in the United Kingdom, in areas ranging from improving education and employment outcomes for disadvantaged youth, to in-home care for at-risk children and addressing homelessness.

SIBs have gone international and are now being implemented across Australia, Europe, North America and even India. For example, the Public Health Agency of Canada is working in partnership with the Heart and Stroke Foundation and the MaRS Centre for Impact Investing to deliver the first health-related SIB in Canada. The Community Hypertension Prevention Initiative is designed to address hypertension (high blood pressure) among seniors. The SIB model allows investors (i.e. foundations, corporations and funds) to provide the upfront capital, and the government only funds the project if it achieves its desired health outcomes, in this case, a change in blood pressure. In Finland, a version of the tool is being used to address Occupational Health and Wellbeing for municipal and state employers. The goal is to reduce the number of sick days used by employees through a range of coordinated preventative interventions, and the agency only pays once tangible results are achieved.

Innovative procurement is providing new ways of buying value

The role of government as a purchaser has the power to influence or even create markets, and has the potential to become a key tool that could be leveraged for innovation in the public sector. However, many governments face major challenges in realising this potential. Government procurement is often an arduous process, regulated by long and complex legal frameworks, which may limit the capacity for innovative ideas to be assessed, or even considered.

According to a recent OECD (2016) survey on procuring innovation, 26% of OECD member countries have instituted an action plan focused on this issue. For example, Austria has established the "Austrian Action Plan on Public Procurement Promoting Innovation" to support the "Austrian Strategy for Research, Technology and Innovation". The strategy aims to create a "systemic, modern policy on research, technology and innovation" by using public procurement as one of the levers. The action plan outlines in detail how this leverage effect will be achieved (i.e. measures, resources and responsibilities).

In Chile, the national procurement regulator, ChileCompra, is working with the Laboratorio de Gobierno to engage with procurement professionals in the development of new procurement guidelines that define the space available for innovative procurement within the existing regulations. The Laboratorio is using human-centred design workshops in three different agencies to connect procurement practitioners with the central regulator. The aim is to develop insights on their approach to implementing regulations and to co-design new guidelines to address grey areas that make space for innovation.

Figure 6.7: Functionalities provided in e-procurement systems

	Mandatory and provided	Not mandatory but provided	Not provided
Publishing procurement plans (about forecasted government needs)	AUS, BEL, CHL, DMK, GRC, HUN, IRL, KOR, MEX, NLD, NZL, NOR, PRT, GBR, USA	AUT, CAN, FIN, DEU, ISL, ITA, JPN, POL, SVN, ESP, SWE, CHE, TUR	EST, FRA, LUX, NLD, SVK
Announcing tenders	AUS, AUT, BEL, CAN, CHL, DNK, EST, FIN, FRA, DEU, GRC, HUN, IRL, ITA, KOR, LUX, MEX, NLD, NZL, NOR, POL, PRT, SVK, SVN, ESP, SWE, CHE, TUR, GBR, USA	ISL, JPN	
Provision of tender documents	AUS, AUT, BEL, CHL, EST, FIN, FRA, DEU, GRC, HUN, IRL, KOR, MEX, NLD, NZL, NOR, POL, PRT, SVK, SVN, SWE, CHE, TUR, GBR, USA	CAN, DNK, ISL, ITA, JPN, LUX, ESP	
Electronic submission of bids (excluding by e-mails)	BEL, CHL, EST, FRA, GRC, ITA, MEX, PRT, USA	AUS, AUT, DNK, FIN, DEU, IRL, JPN, KOR, LUX, NLD, NZL, NOR, SVK, SVN, ESP, SWE, TUR, GBR	CAN, HUN, ISL, POL, CHE
e-tendering	BEL, CAN, CHL, EST, GRC, IRL, ITA, MEX, CHE, USA	AUT, DNK, FIN, FRA, DEU, JPN, KOR, NLD, NZL, NOR, PRT, SVK, SVN, ESP, SWE, TUR, GBR	AUS, HUN, ISL, LUX, POL
e-auctions (in e-tendering)	GRC, MEX, SVK, SVN, USA	AUT, DNK, EST, FIN, FRA, DEU, IRL, ITA, NLD, NZL, NOR, PRT, SWE, CHE, GBR	AUS, BEL, CAN, CHL, HUN, ISL, JPN, KOR, LUX, POL, ESP, TUR
Notification of award	AUS, AUT, BEL, CAN, CHL, DNK, EST, FIN, DEU, GRC, HUN, IRL, KOR, MEX, NLD, NZL, NOR, POL, PRT, SVK, SVN, ESP, SWE, CHE, TUR, USA	FRA, ITA, JPN, GBR	ISL, LUX
Ordering	CHL, ITA, NLD, CHE, USA	AUT, BEL, CAN, DNK, FIN, FRA, DEU, JPN, KOR, NZL, NOR, SVN, ESP, SWE, TUR, GBR	AUS, EST, GRC, HUN, ISL, IRL, LUX, MEX, POL, PRT, SVK
Electronic submission of invoices (excluding by e-mails)	AUT, DNK, FIN, ITA, NLD, ESP, SVN, SWE, CHE, USA	FRA, DEU, ISL, JPN, KOR, NZL, NOR, GBR	AUS, BEL, CAN, CHL, EST, GRC, HUN, IRL, LUX, MEX, POL, PRT, SVK, TUR
Ex-post contract management	CHE, TUR, USA	DNK, FIN, DEU, ITA, JPN, KOR, NZL, NOR, SVN, SWE	AUS, AUT, BEL, CAN, CHL, EST, FRA, GRC, HUN, ISL, IRL, LUX, MEX, NLD, POL, PRT, SVK, ESP, GBR

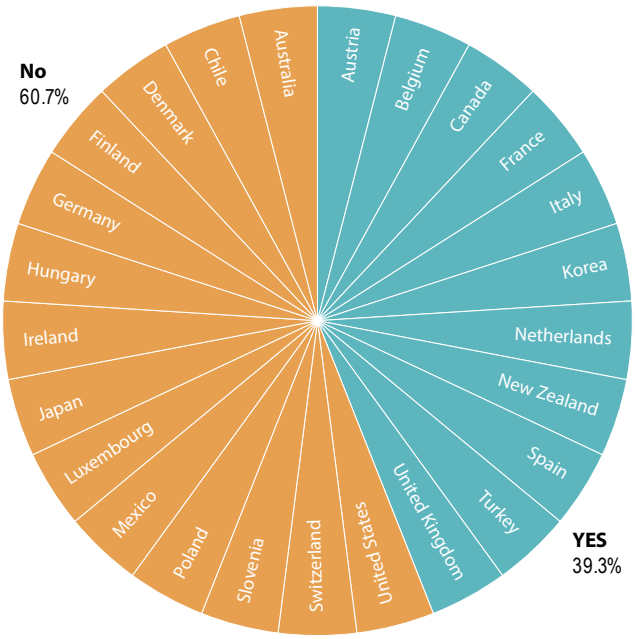
Source: OECD (2014) Survey on Public Procurement

Data unavailable for the Czech Republic.

Online procurement platforms are another tool receiving increased attention as a way of developing more agile projects and supporting small and medium-sized enterprises (see Figure 6.7). Some governments are using such electronic procurement systems to innovate the ways in which they make purchases. The United States Micro-purchase Platform from 18F (see case study) uses online sealed-bid and reverse auctions to purchase software code worth a maximum of USD 3 500, which allows them to bypass the cumbersome rules applied to larger procurement projects. Australia is currently beta-testing a "Digital Marketplace", described as an ecosystem to link government buyers with suppliers, support two-way collaboration, and eventually provide a platform to launch challenges to which suppliers can pitch creative solutions.

Interestingly, even when countries set up innovation-related action plans, policies and projects, most do not measure the results (see Figure 6.8). This could potentially raise challenges in determining whether the initiative is successful or a failure, or providing a justification for additional innovation. Although the observed growth in innovative procurement practices is encouraging, this shows that more work needs to be done in evaluating their outcomes.

Figure 6.8: Measuring results of public procurement policies/strategies for innovative goods and services, 2014



Source: OECD (2014) Survey on Public Procurement.

Funding models are moving from reactive to proactive

Government spending is often reactive to events and situations that are already occurring, with limited consideration for future events. Innovative new funding models are reversing this concept by allowing funding decisions to be made with the future in mind. A key area where this is occurring is humanitarian aid, which makes resources available mainly after disasters. One new approach in this field is the concept of Forecast-Based Financing (FbF). FbF recognises that despite the presence of emergency forecasts, resources are often unavailable prior to the disaster due to lack of certainty and doubts that the planned action would be of use. However, the window between a forecast and a disaster provides sufficient time to implement a variety of actions, and FbF can help in this regard by releasing funds based on forecast information for planned activities to reduce risks and make risk management more effective. FbF is an automatic system that, once triggered, funds preparedness actions prior to the disaster strikes as soon as a credible warning arrives (Red Cross/Red Crescent, 2016).

The German Red Cross has led initial FbF efforts with backing from the Government of Germany. Its use has proven ground-breaking in Uganda, where a scientific forecast of flood risk triggered humanitarian action. The Red Cross distributed 5 000 preparedness items (fuel, soap and water purification tablets) to flood-prone communities.[72]

Support for FbF is spreading. The Government of the Netherlands has publicly supported the concept, and donor countries such as the United Kingdom and the United States have expressed interest. In addition to Uganda, FbF has been used in other countries including Peru and Togo (Red Cross/Red Crescent, 2016).

72. See *https://understandrisk.org/forecast-based-financing/*.

Challenges

Most government institutions were not designed with innovation in mind. Developing the kinds of people and financial management mechanisms described above requires taking a look at government bureaucracies through a fresh lens. This can present a range of challenges:

Competing priorities across government. The institutions, rules and processes to structure and manage financial and human resources in government have been developed to meet many, sometimes competing objectives. Workforce management is often guided by the need to ensure merit, equity and fairness, and is often highly regulated and/or governed through collective agreements. Financial regulations are usually designed to, first and foremost, ensure transparency and reduce the potential for corruption. Innovating in either of these functions usually requires negotiating complex webs of rules and regulations that are not always straightforward or immediately apparent.

Working through the complexities of government. A second set of challenges relates to the sheer size of governments. Government bureaucracies are usually among the largest organisations and employers in any given country. The size of their budgets and workforce means that implementing even relatively simple reform to these areas can take significant effort, time and resources. The size of government also makes it hard for any particular function to have a broad overview of the system as a whole, as each works to ensure its piece of the puzzle is maintained. Taking time to step back and look at government management systems as a whole, from the perspective of innovation, rarely falls into any one organisation's job description.

Evaluating innovation is difficult. The issues related to realising benefits constitute another challenge. Governments are not very good at measuring their own internal operations and understanding their costs. Human and financial resource management systems are situated significantly "upstream" of the impacts that governments create, which makes it difficult to assess how changing them leads to direct impact on the ground. Furthermore, many of the impacts of data-driven people management or skills training, for example, may never be quantitatively measured and may take time to materialise.

Contributing factors

Starting small can lead to larger successes. Some of the challenges discussed above can be managed to some degree by scaling down the scope of the reform to specific pilot agencies, and by increasing certain kinds of delegation to ministries and agencies. Pilot projects provide an opportunity to test reforms on a smaller scale before rolling out more broadly. Developing complex data systems for people management can also be tested in pilot ministries before being rolled out across the civil service. Piloting initiatives on a small scale also encourages careful reflection regarding the kinds of indicators and monitoring that need to be in place to establish a baseline and measure impact.

A culture of empowerment and skills enables innovation. Increasing delegation for certain aspects of human and financial management can help to spur innovation in these areas, as central regulation is relaxed and ministries/agencies are encouraged to find solutions to their own problems. This requires a high level of capacity in all ministries and agencies, such as through the skills framework discussed above, and requires a strong centre to oversee the system and encourage sharing across agencies of good innovative solutions. This strong centre can set the tone for innovative culture in government and can help to reduce friction around some of the challenges associated with competing priorities by aligning different parts of government around a common set of principles. In many cases, the role of the centre should be to clarify legal boundaries, so that agencies possess a good understanding of the space available for innovation.

Recommendations

The following recommendations can help governments ensure their institutions keep pace with the changing demands of society for innovation:

1. **Do not accept the system as given.**
   Although things may have always been done in a particular way, this does not mean they cannot be changed. Flexibilities in the current system can be identified and leveraged to help clarify and facilitate change for civil servants, such as in the Micro-purchase Platform example in the final case study. Once prioritised, systems can be streamlined and revised to better facilitate innovation.

2. **Undertake systems analysis through an innovation lens.**
   This could take the form of a review of HR and/or financial management systems, focused on looking for opportunities to reorganise and clarify aspects that may be impeding innovation.

3. **Invest in human capacity.**
   Financial mechanisms can help, but only in the hands of qualified and trained professionals. People management should move away from managing quantity to quality. This means moving from cost management to talent management and skills building.

4. **Encourage cross-government networks.**
   As discussed above, connecting people to share ideas can help transform the ways in which government works though the sharing and compounding of innovative ideas, such as in Denmark's *Spreading Innovation*, discussed in the following case study. Although this trend largely concerns government offices, this does not preclude the interaction of external organisations and citizens in these networks. New ideas on human resource and financial management can emerge from other sectors, as these concepts are clearly not limited to government.

CASE STUDY

Spreading Innovation – Denmark

SUMMARY

Many good innovative solutions exist within and across governments, however it is often difficult to systematise the diffusion of innovation because potential innovators have no actual tools to help them replicate good ideas. To overcome this challenge, the National Centre for Public Sector Innovation (COI) in Denmark has developed *Spreading Innovation*,[73] a step-by-step guide to help replicate innovations in new contexts. Launched in 2016, the guide is freely available online. It provides a simplified overview of the innovation process, suggests actions for individual stakeholders, and provides a series of guiding questions that can support dialogue between people who want to share an innovation and people who want to adapt it to a new context. The guide makes it more manageable for governments to work systematically to spread innovation.

73.The guide is written in plain language and is freely available at *http://coi.dk/spreadinginnovation*.

THE PROBLEM

Innovations are not often spread systematically to other public sector workplaces and remain siloed within the organisations where they were developed. Some innovators fail to realise that their solutions can be usefully applied elsewhere, some lack the means to share their work with a broader audience, and some have no way to discover the innovative work of others.

Traditional methods to communicate innovation, such as awards, ceremonies or databases, play a useful role in spreading ideas, and celebrating and raising awareness about innovation. However, replicating innovations requires changes both to the innovation itself and to the system it will impact. Therefore, the diffusion of innovation is a complex action. Most innovations require adaptation in some form, however there is a lack of information on how to make spreading innovation in the public sector a systematic process.

AN INNOVATIVE SOLUTION

In order to break down bureaucratic silos and help governments create new ways of working, COI created the *Spreading Innovation* guide, with the aim of supporting institutions and individuals in the process of replicating innovation in the public sector, and thereby reducing the risks and costs associated with innovation.

COI designed the guide in three phases over the course of a year. The process involved over 100 people and enjoyed the support of an Advisory Board of handpicked practitioners and researchers.

- **In the 1st phase**, a team of researchers carried out a literature review of processes for diffusion of innovation in government.
- **In the 2nd phase**, the COI conducted field studies in 11 Danish municipalities involved in innovation in the area of welfare technology. Using observation techniques and approaches linked to behavioural economics and "nudge", the COI endeavoured to answer the following question: What happens when institutions spread innovation?
- **In the 3rd phase**, the main findings were tested in other contexts (e.g. business growth immigration services and child care), across all levels of government (central government, local authorities, hospitals, etc.) and even in non-governmental organisations working on welfare innovation.

The result of the process was *Spreading Innovation*, a guide deeply anchored in concrete experience and research. It is a tool that supports dialogue between **sharers** (teams who want to share an innovation) and **re-users** (teams that want to replicate an innovation). Although any interested sharer/re-user can download and use the guide independently, the COI firmly believes that personal relationships are essential for innovation and organises networking events to facilitate matching between potential sharers and re-users.

The guide gives an overview of an otherwise complex process. It is structured around six key steps to help government officials share and reuse an innovation (as shown in Appendix IV). For each of these steps, there is a checklist of proposed actions to take and questions in the form of dialogue tools to guide discussions between teams. This approach enables the *Spreading Innovation* guide to support the spreading of innovations in government, while respecting institutional conditions that may require

reinvention or re-contextualisation of some aspects of innovation processes – for example, taking into account the complexities that can exist between municipal, regional and state workplaces.

NOVELTY

A study across the Danish public sector published by COI in 24 October 2016 showed that almost 80% of innovations are carried out in collaboration with external partners, and that over 70% of innovations are directly copied or inspired by other people's solutions. The COI identified an opportunity here to accelerate the rate of innovation by facilitating dialogue between sharers and re-users. The *Spreading Innovation* guide became a first attempt to facilitate this dialogue and help systematise this new way of working in government.

IMPACT AND RESULTS

Replicating innovations with the support of experienced people is expected to facilitate the process and reduce the costs associated with innovations. To test the hands-on application of the guide and iteratively improve on it, the COI is currently supporting two teams in the replication of an innovation. One of these teams is the Roskilde Municipality, which is sharing its experience on creating a better system to address citizens' complaints with NaturErhvervsstyrelsen, the Danish Agrifish Agency. Both institutions met during a networking event hosted by the COI in late 2015, and are now finalising the first step of the guide in collaboration with the COI.

Using the guide has a clear benefit for replicators as it simplifies their innovation process, but sharer institutions also have an opportunity to build a structured approach to their initiative. A Spreading Innovation participant stated that, "By sharing our innovation with another institution, we revisited our own project and saw it under a different light. It allowed us to rediscover knowledge that was inside our institution, and it showed us the potential to scale up the initial innovation".

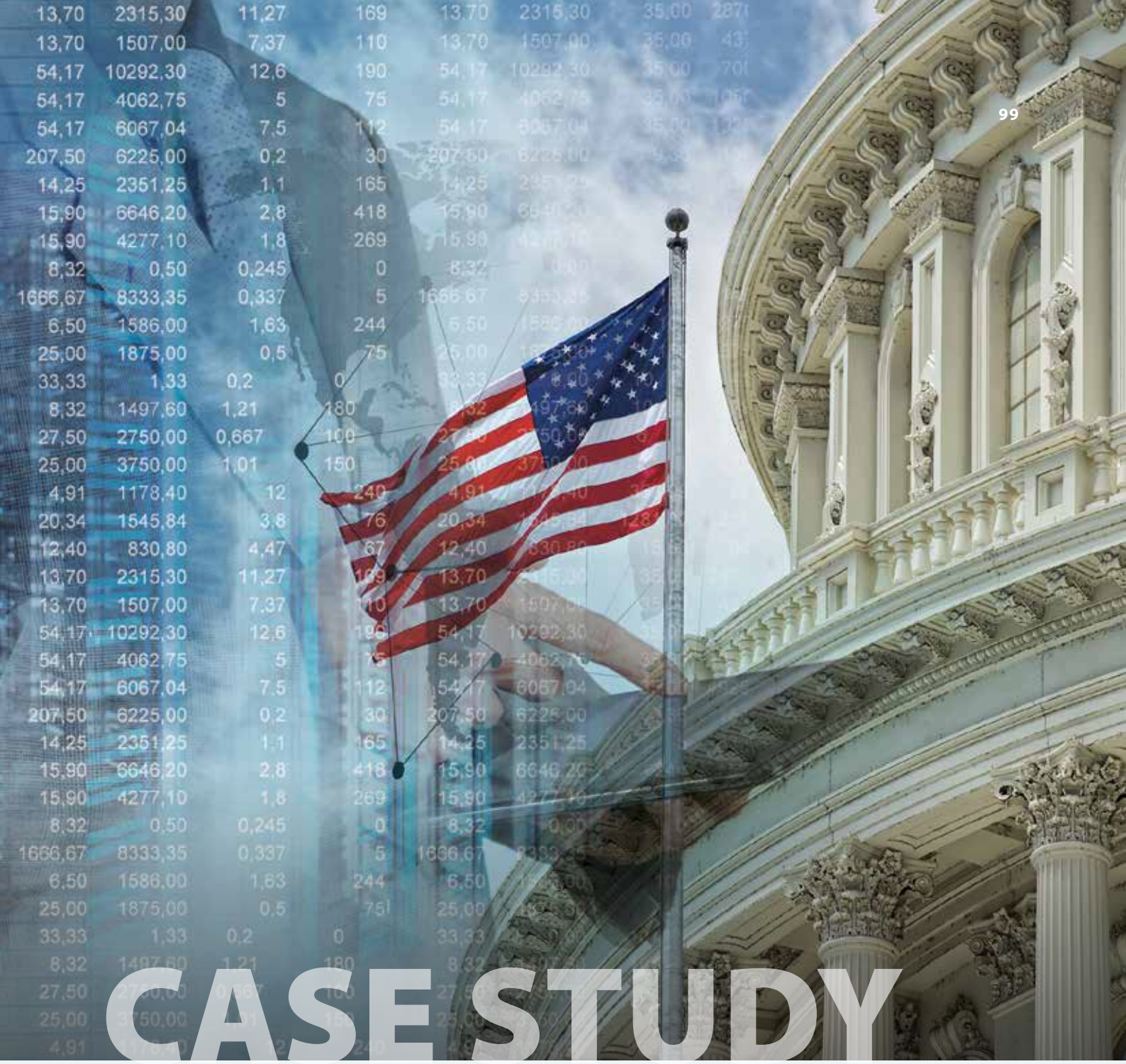
REPLICABILITY

The core purpose of the *Spreading Innovation* guide is the replicability of innovation in government. It was designed as a flexible solution to facilitate dialogue around innovation processes, in order to improve the replicability of innovations and develop ways of working in government, based on better dialogue and collaboration across departments.

CHALLENGES AND LESSONS LEARNED

The main challenge in designing the *Spreading Innovation* guide was bringing together field experience and academic research on the diffusion of innovation in government. One of the ways found to address this challenge was to bring both communities together in the form of the Spreading Innovation Advisory Board, however field experience was also incorporated through the observation of innovation processes at municipal level. Once the knowledge base was established, COI aimed to produce a guide useful for other policy areas and levels of government, and had to undertake substantive work to simplify and test it in different contexts.

Currently, an important element to the success of the *Spreading Innovation* guide is institution matching. To achieve this objective, COI organises networking events for its large audience. Embedding innovation in government implies that knowledge and know-how cannot just be delegated to outsiders. This is why networking events that bring people together are as important to spreading innovation as the guide itself.



CASE STUDY

Micro-purchase Platform – United States

SUMMARY

The process of government procurement is a critical but complex element of nearly all government programmes, and is viewed by many as one of the most significant barriers to innovation. 18F,[74] a digital service innovation team in the United States government, has turned procurement rules on their head by launching the Micro-Purchase Platform, a reverse-auction system that leverages legal flexibilities to obtain software development through simple credit card purchases.[75]

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74. See *https://18f.gsa.gov.*

75. See *https://micropurchase.18f.gov.*

Figure 6.9: 18F Micro-purchase Platform Insights

Source: https://micropurchase.18f.gov/insights (accessed 16 January 2017).

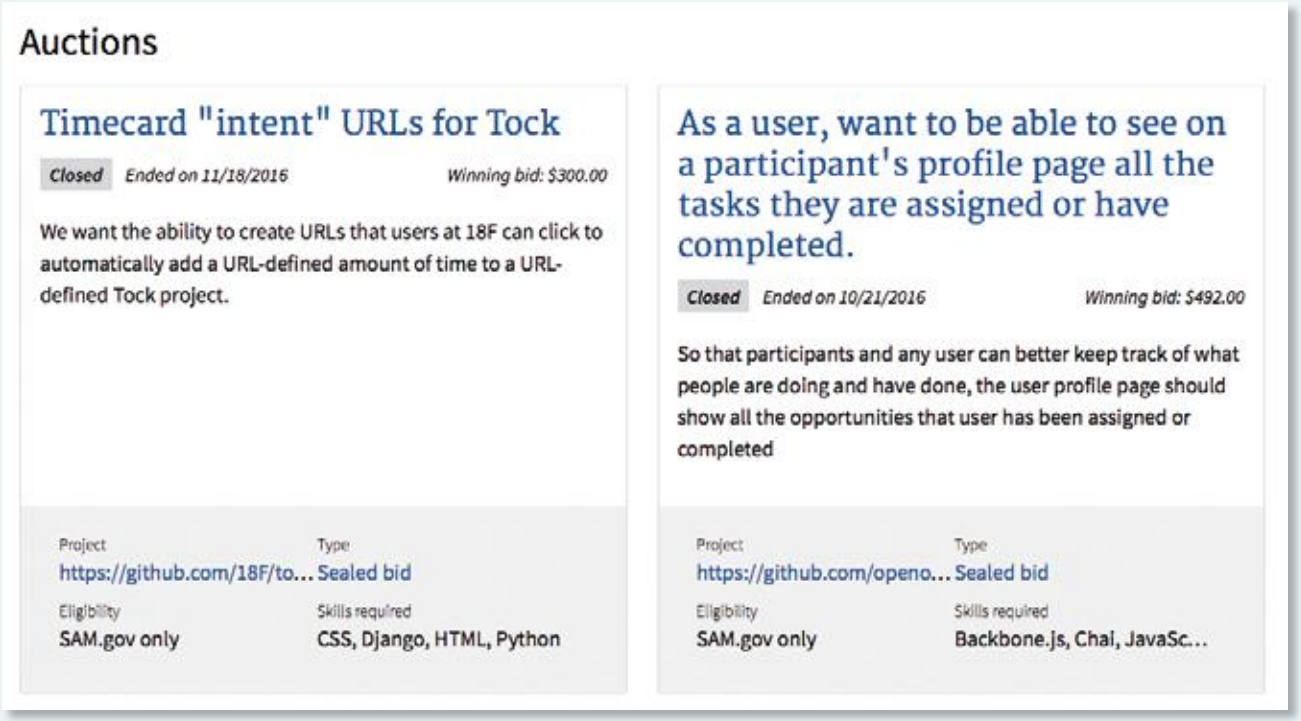
THE PROBLEM

Contracting for software is often an arduous process. The Federal Acquisition Regulation (FAR), which sets the rules for procurement in the United States government, is nearly 2 000 pages long and difficult to navigate to obtain the products and services needed for civil servants to achieve their missions. Because of its complexity, government employees can struggle to know how to buy services in an agile way. Additionally, innovative start-ups and other small businesses can face high barriers to entry to the Federal market. Many vendors are not willing to expend such effort, which can result in the same pool of large vendors that know the system competing for the majority of contracts. The challenges on both sides of the market result in purchases that take months or even years to complete, with limited competition resulting in reduced value for government. The complexity also encourages "waterfall" software development, where all needs are stated up front. This results in products that are much more likely to fail than agile products, and which are outdated by the time they are released and do not meet user needs.

AN INNOVATIVE SOLUTION

18F has launched the Micro-purchase Platform, an auction-bidding system for open source software development that allows project teams to obtain software features needed to better perform their duties, faster and more cheaply than through traditional processes. The platform works by leveraging an underutilised legal flexibility called the "micro-purchase authority". This authority allows Federal agencies to use a credit card to directly buy products and services, as long as the price does not exceed USD 3 500, and is most often used to items such as office supplies. This allows agencies to avoid complicated and cumbersome procurement rules for small purchases. Micro-purchase auctions are set up for a specific software feature needed

Figure 6.10: Recent Micro-purchase auctions



Source: https://micropurchase.18f.gov/insights (accessed 16 January 2017).

by 18F or one of their clients. They either use sealed bids or take the form of reverse auctions that start at USD 3 500, where interested software developers can bid for the work, with each bid being lower than the last. Upon completion of the auction requirements, 18F pays the winning bid amount to the winner.

18F as an organisation is an innovation in itself, and its stated goal is to serve as a testbed for innovation. It takes the form of a digital services development and consultancy start-up housed at the centre of the United States government, partnering with agencies to transform how they deliver digital services and technology products to the public. 18F has several core values that the Micro-purchase Platform is designed to strengthen throughout government.

- **User-centred design:** building digital services that solve the needs of users and are enjoyable to use.
- **Agile:** using iterative development techniques that deliver value in short sprints that enable a regular feedback loop and continuous improvements.
- **Open source:** working in an open, transparent way and making all products and code fully accessible to the public to build trust and enhance value.

Consistent with these values, the objective of the platform is to encourage new vendors to work on open source solutions to small problems that would be too cumbersome to address with traditional contracting methods. Because the auctions are a feature that solves a clear and contained problem, they help to quickly meet the needs of users in an agile way. Brendan Sudol, the winner of the first auction and now an 18F employee, told us that this is key to the success of the programme and to attracting developers. Through the platform, 18F also sought to provide another reason for United States agencies to support open source code by using the platform as a way to demonstrate how open source solutions make it easier for government to build software applications.[76]

76. More information about the Micro-purchase Platform and the option to bid on a reverse auction can be found at *https://micropurchase.18f.gov*. To use 18F's code to build a platform, visit *https://github.com/18F/micropurchase*. 18F can be followed on *Twitter @18F*.

"I want federal procurement to be joyful. I want us to think about buying software and buying professional services as not a thing to be dreaded, but a thing that should be easy and frankly fun."

Dave Zvenyach, Acting Director of 18F[77]

NOVELTY

Although not all that common, government procurement auctions do exist. However, the Micro-purchase Platform is the only known platform offered as open source and built with the purpose to automate decisions to foster confidence and an agile and innovative culture in government.

IMPACT AND RESULTS

The first micro-purchase auction was won for USD 1, and the vendor delivered functioning code to enhance government software. Independent estimates[78] show that, through using the platform, 18F pays about half the rate they would have through traditional means, saving USD 1 000 per auction. 18F has since held a total of 37 auctions, which they estimate saved the government USD 70 990. Unlike the weeks, months or years traditional procurement can take, the average delivery time on these projects was eight days. So far, 96 small businesses have newly registered to do business with the government. A client who uses auctions for her programs stated that it has allowed her to obtain features she might not have been able to otherwise secure, as resources and in-house developers are scarce.

"I figured it would be cool to be a part of this first micro-purchase experiment, and demonstrate that there are people (at least one but I think a lot more) willing and excited to help out on meaningful, civic-minded initiatives. I love working on little web projects in my free time. This is USD 1 more than I make on those, and this one actually helps people."

Brendan Sudol, winner of the first Micro-purchase auction, and now an 18F employee[79]

Even failures can result in positive results. There have been rare occasions where auctions have failed because the vendor was unable to complete the requirements. Seeing this as an opportunity, 18F holds "blameless retrospectives" in these instances, where the auction team and the vendor come together to determine what went wrong and how to prevent it from happening again in the future.

Declaring the Micro-purchase Platform a success worthy of scaling, 18F has plans to build upon this innovation in the future. The team is eyeing ways to hold auctions at values above the USD 3 500 level by automating some of the processes and documentation needed for larger procurements to make things simpler for government officials. Additionally, they are exploring adding "self-service" features to the platform to make it easy for other agencies to post and manage their own auctions.

REPLICABILITY

Procurement is universal. Just about every public sector organisation at each level of government must procure goods and services in order to meet its mission. Frustrations with procurement complexities are perhaps just as universal. Any country that has similar rules around small purchases could develop their own platform, and the 18F team makes it easy. 18F describes itself as an "open source team" and has a default position to work in the open and publish all source code created for or by 18F. In following this philosophy, all of the source code for the Micro-purchase Platform is available on GitHub for replication. The platform has already been "forked" by the country of Singapore to set up a similar system,[80] with significant potential for other countries to do the same.

CHALLENGES AND LESSONS LEARNED

18F officials who were interviewed stated that the main challenges they faced were mostly bureaucratic in nature, including long processes to enter into agreements to work with other agencies. Such challenges can slow scaling of the platform to other agencies. However, 18F officials explained that these challenges can also help them to identify the most pressing "pain points" and seek solutions for automating them through the platform.

77. Source**:** *http://publicspendforum.net/2016/06/16/18f-dave-zvenyach-podcast.*

78. See *www.federaltimes.com/story/government/acquisition/2016/08/15/micropurchase-auctions-18f-getting-big-value-small-buys/88401228.*

79. *Source*: *http://brendansudol.com/writing/18f-micropurchase.*

80. See *https://buy.gds-gov.tech.*

Conclusion

Innovation in government is about opening up new ways to impact the everyday lives of citizens, and new approaches to activating them as partners to shape the future of government together. It involves overcoming old structures and modes of thinking and embracing new technologies, processes and ideas. It is based on securing the public's trust and acting as sound stewards of their resources. Most importantly, innovation unlocks ways to ensure wellbeing, safety and justice for citizens, and serves as a catalyst to spark creativity and action in society far beyond the walls of government.

The power and potential of innovation in government is immense, and grows daily as societies become more connected and the challenges they face grow more complex. Governments and civil servant around the world are transforming the way they work to ensure this potential is met, by solving problems using novel and impactful approaches that provide lessons about what may work and what may not. In particular, as discussed in this report, these approaches include:

- balancing and augmenting the comparative advantages of **human and machine** approaches for solutions that exceed the abilities of each of these alone;
- finding new ways to **zoom in or zoom out** to scale government services for more impact and to identify new solutions at a scale not previously possible;
- involving **citizens as experts** to provide new ideas and stimulate innovation among those most affected by its outcomes;
- developing **mass or personalised services** that are user-centred, view citizens holistically, and recognise that individuals have unique wants and needs;
- fostering the principles and cultures of **experimental government** to turn the public sector into a testbed for testing innovative ideas;
- **breaking the norms** in the areas of government that manage human and financial resources, and which serve as the brains and lifeblood of public programmes.

Accomplishing this is no easy task. Governments are often federated and fragmented and vary dramatically from country to country and from administration to administration. This provides a unique set of challenges that require government innovators to simultaneously and delicately balance and connect central authority with local autonomy, shape the future of government while grappling with the political and social realities of today, and overcome and reverse cultural challenges such as risk aversion and fear of failure. In a real sense, government innovators are always on the cusp of failure and the future. This is a precarious position, yet courageous innovators and ideas are multiplying within governments around the world at an impressive and heartening rate.

The topics identified through this review are not the only trends and examples in government innovation, but they do provide a glimpse of where government innovation stands today and where it may be going tomorrow. By identifying and sharing them and by serving as a global forum for connecting innovators around the world, the OECD and MBRCGI hope that they can be used by others to embed successes, reduce the impact of failure, and speed up the transformative process of innovation to deliver value for citizens at new heights and scales.

Appendix I: Central government support for open government data

	Strategy/Infrastructure		Consultations	Data re-use support and promotion		Data accessibility on the national portal			
	Single Central/federal OGD strategy	Existence of a national OGD portal	Regular consultation of users' needs for data release	Organization of co-creation type events (e.g. hackathons)	Training for civil servants to build capacities for data analysis and re-use	Data released in CSV format (machine readable)	Systematic provision of metadata	User feedback section	Possibility to receive notification when datasets are added
Australia	✓	✓	✓	◆	■	■	✓	✓	✓
Austria	✓	✓	✓	◆	◆	■	✓	✗	✓
Belgium	✗	✓	✓	◆	◆	■	✓	✓	✗
Canada	✓	✓	✓	■	◆	■	✓	✓	✗
Chile	✓	✓	✗	■	◆	■	✓	✓	✗
Denmark	✗	✓	✗	◆	□	■	✗	✓	✓
Estonia	✓	✓	✓	◆	□	■	✓	✓	✗
Finland	✓	✓	✓	■	◆	■	✗	✓	✗
France	✓	✓	✓	■	◆	■	✓	✓	✓
Germany	✓	✓	✓	◆	□	■	✗	✓	✗
Greece	✓	✓	✓	■	◆	◆	✗	✓	✗
Hungary	✗	✓	✓	□	◆	?	?	?	?
Ireland	✓	✓	✓	?	?	■	✗	✓	✗
Italy	✓	✓	✓	■	◆	■	✓	✗	✗
Japan	✓	✓	✓	◆	◆	■	✓	✓	✓
Korea	✓	✓	✓	■	■	■	✓	✓	✓
Mexico	✓	✓	✓	■	■	■	✓	✓	✗
Netherlands	✓	✓	✗	◆	□	■	✓	✗	✗
New Zealand	✓	✓	✓	◆	◆	■	✗	✓	✓
Norway	✓	✓	✓	■	◆	■	✓	✓	✗
Poland	✓	✓	✗	□	◆	◆	✓	✗	✗
Portugal	✓	✓	✓	◆	◆	■	✓	✓	✗
Slovak Republic	✗	✓	✓	◆	□	■	✓	✗	✗
Slovenia	✓	✓	✗	□	◆	■	✗	✓	✓
Spain	✓	✓	✓	■	■	■	✓	✓	✓
Sweden	✓	✓	✓	?	?	■	✗	✓	✗
Switzerland	✓	✓	✓	■	◆	■	✓	✗	✓
Turkey	✗	✗	✗	◆	□	···	···	···	···
United Kingdom	✓	✓	✓	◆	■	■	✓	✓	✓
United States	✓	✓	✓	?	?	■	✓	✓	✗
Total OECD	25	29	24				20	22	11
Colombia	✓	✓	✓	■	◆	■	✓	✓	✗
Latvia	✗	✗	✓	◆	□	···	···	···	···

✓ Yes ✗ No ■ Often/generally ◆ Sometimes □ Never ? Missing data ··· Not applicable

Source: 2014 OECD Survey on Open Government Data

Data for the Czech Republic, Iceland, and Luxembourg are not available.

Appendix II: Open government initiatives by country

Which of the below initiatives on open government is your country currently implementing or has it already implemented?

	Citizens' consultation	Citizen participation in policy making	Citizen participation in service design	Citizen participation in service delivery
Australia	●	●	●	●
Austria	●	●		
Belgium				
Canada				
Chile	●			
Czech Republic				
Denmark	●		●	
Estonia	●	●		●
Finland	●	●	●	●
France	●	●	●	●
Germany		●		
Greece	●			
Hungary	●			
Iceland	●	●		
Ireland	●	●	●	●
Italy	●		●	●
Japan	●	●	●	●
Korea	●	●	●	●
Latvia	●	●	●	
Luxembourg	●	●	●	●
Mexico	●	●	●	●
Netherlands	●	●	●	●
New Zealand	●	●	●	●
Norway	●		●	
Poland	●	●	●	
Portugal	●	●		
Slovakia	●	●		●
Slovenia	●	●		
Spain	●		●	●
Sweden		●		
Switzerland				
Turkey	●	●	●	●
United Kingdom	●	●	●	●
United States			●	
Argentina	●	●	●	
Brazil		●	●	●
Colombia		●	●	●
Costa Rica		●	●	
El Salvador	●	●	●	●
Guatemala				
Panama		●	●	
Paraguay		●	●	●
Peru				
Dominican Republic		●	●	
Uruguay		●	●	
Indonesia	●	●		●
Jordan	●	●		●
Lithuania	●	●		●
Morocco	●	●		
Philippines				●
Romania	●	●		
Tunisia	●	●	●	●
OECD35	80%	66%	57%	49%
ALL53	68%	72%	57%	49%

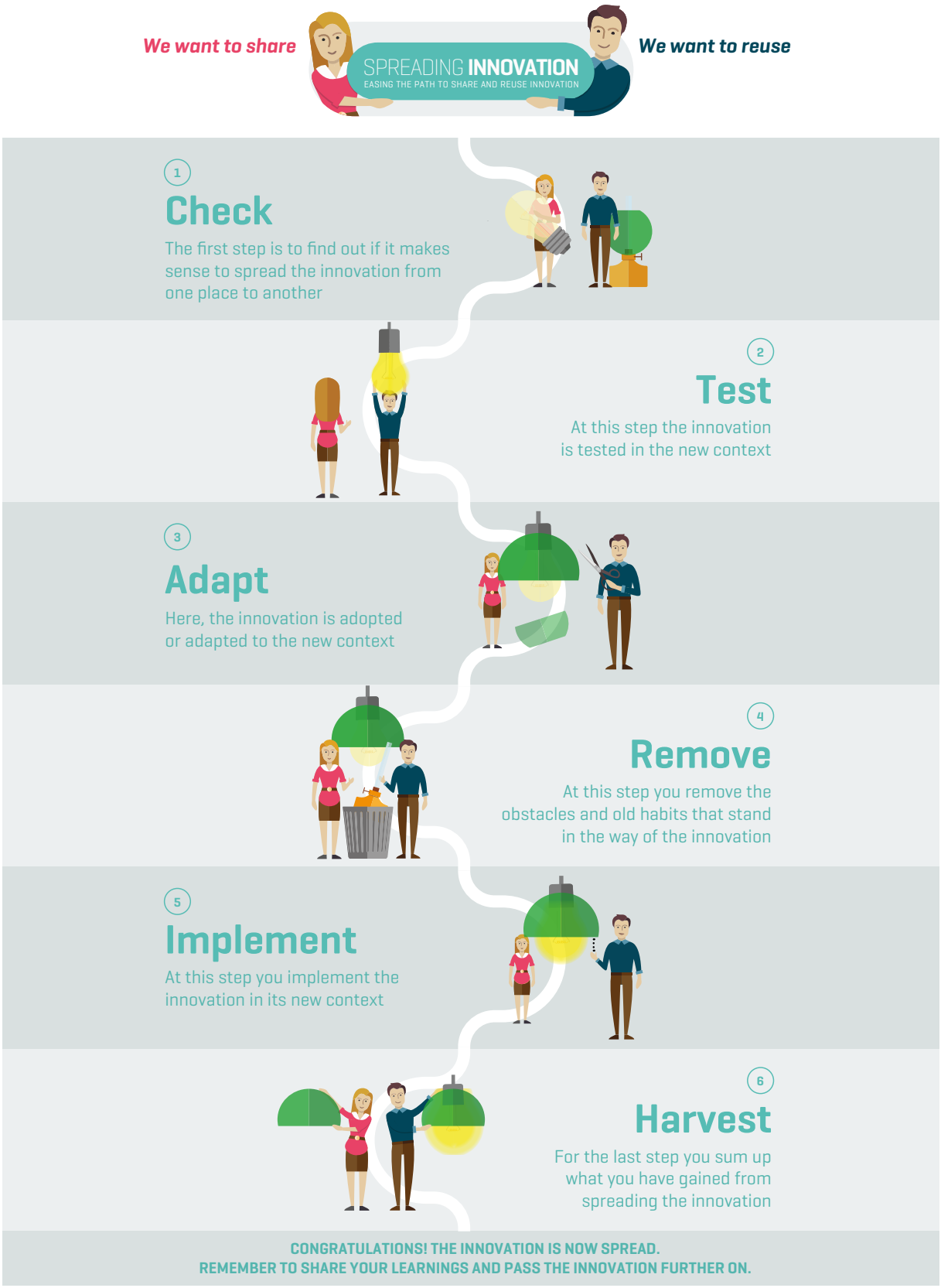
Source: OECD (2015) Survey on Open Government Co-ordination and Citizen Participation in the Policy Cycle.

Appendix III: Placement of public sector innovation in surveyed countries

Country	Government-wide strategy objectives	Training and development	Leadership development	Comp frame	Performance assessment criteria	Workforce development	Recruitment strategy	Promo criteria	Employee Surveys
Australia	✓	✗	✗	✗	✗	✗	✗	✗	✗
Austria	✓	✓	✓	✗	✗	✗	✓	✗	✗
Belgium	✓	✓	✓	✓	✓	✓	✓	✗	✗
Canada	✓	✓	✓	✓	✓	✗	✓	✓	✓
Chile	✓	✓	✗	✓	✗	✓	✗	✗	✗
Czech Republic	✓	✓	✓	✗	✓	✗	✓	✓	✓
Denmark	✓	✓	✗	✓	✗	✗	✗	✗	✗
Estonia	✓	✓	✓	✓	✗	✗	✗	✗	✓
Finland	✓	✓	✓	✓	✗	✓	✗	✗	✗
France	✓	✗	✓	✗	✗	✗	✗	✗	✗
Germany	✗	✓	✗	✗	✗	✗	✗	✗	✗
Greece	✓	✓	✓	✓	✓	✓	✓	✓	✗
Hungary	✓	✗	✗	✗	✗	✗	✗	✗	✗
Iceland	✗	✗	✗	✗	✗	✗	✗	✗	✗
Ireland	✓	✗	✗	✗	✗	✗	✗	✗	✓
Italy	✓	✓	✗	✗	✗	✓	✓	✗	✗
Japan	✓	✓	✓	✗	✓	✗	✗	✓	✗
Korea	✓	✓	✓	✓	✓	✗	✓	✓	✗
Luxembourg	✗	✗	✗	✗	✗	✗	✗	✗	✗
Mexico	✓	✓	✗	✓	✗	✓	✗	✗	✗
Netherlands	✗	✗	✗	✗	✗	✗	✗	✗	✗
New Zealand	✓	✗	✗	✗	✗	✗	✗	✗	✗
Norway	✓	✗	✓	✗	✗	✗	✗	✗	✗
Poland	✓	✓	✗	✗	✓	✗	✗	✗	✗
Portugal	✓	✓	✓	✓	✓	✗	✗	✗	✗
Slovak Republic	✓	✓	✗	✗	✓	✓	✗	✗	✗
Slovenia	✗	✗	✓	✓	✓	✗	✗	✓	✗
Spain	✗	1	✗	✓	✓	✗	✓	✓	✗
Sweden	✓	✗	✗	✗	✗	✗	✗	✗	✗
Switzerland	✓	✗	✓	✗	✗	✗	✗	✗	✗
Turkey	✗	✓	✓	✓	✓	✓	✓	✓	✗
United Kingdom	✓	✓	✓	✓	✓	✓	✓	✗	✗
United States	✓	✗	✓	✗	✗	✓	✓	✗	✓
Lithuania	✓	✓	✗	✗	✗	✗	✗	✗	✗
Latvia	✓	✗	✓	✓	✗	✗	✗	✗	✗
Colombia	✓	✗	✓	✓	✗	✓	✗	✗	✗
Costa Rica	✗	✗	✗	✗	✗	✗	✗	✗	✗
Total	29	22	20	17	14	12	11	8	6

Source: OECD (2016), Survey on Strategic Human Resources Management in Central/Federal Governments of OECD Countries (preliminary results), OECD Publishing, Paris.

Appendix IV: Steps from the *Spreading Innovation* Guide



References

TREND 1

Heaton, B. (2015), "New York City fights fire with data. Analytics help New York City firefighters track potential hot spots", *Government Technology*, 15 May (online), www.govtech.com/public-safety/New-York-City-Fights-Fire-with-Data.html (accessed 2 December 2016).

Helbing, D. (2015), *Societal, Economic, Ethical and Legal Challenges of the Digital Revolution. From Big Data to Deep Learning, Artificial Intelligence, and Manipulative Technologies*, SSRN (Social Science Research Network), http://dx.doi.org/10.2139/ssrn.2594352.

Höchtl, J., P. Parycek and R. Schöllhammer (2016), "Big data in the policy cycle: Policy decision making in the digital era", *Journal of Organizational Computing and Electronic Commerce*, 26(1-2), pp. 147-169, DOI: 10.1080/10919392.2015.1125187.

OECD (2017a), *OECD Report on Risk Governance*, OECD Publishing, Paris, forthcoming.

OECD (2017b) "A data-driven public sector for sustainable and inclusive governance", *OECD Working Papers on Public Governance*, OECD Publishing, Paris, forthcoming.

OECD (2016a), "The Internet of Things: Seizing the benefits and addressing the challenges", *OECD Digital Economy Papers*, No. 252, OECD Publishing, Paris, http://dx.doi.org/10.1787/5jlwvzz8td0n-en.

OECD (2016b), *OECD Science, Technology and Innovation Outlook 2016*, OECD Publishing, Paris. http://dx.doi.org/10.1787/sti_in_outlook-2016-en.

OECD (2015a), "Open government data", in *Government at a Glance 2015*, OECD Publishing, Paris, http://dx.doi.org/10.1787/gov_glance-2015-48-en.

OECD (2015b), "The changing face of strategic crisis management", *OECD Reviews of Risk Management Policies*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264249127-en.

OECD (2014), *Boosting Resilience Through Innovative Risk Governance*, OECD Reviews of Risk Management Policies, OECD Publishing, Paris.

Mickoleit, A. (2014), "Social media use by governments, a policy primer to discuss trends, identify policy opportunities and guide decision makers", *OECD Working Papers on Public Governance*, No. 26, OECD Publishing, Paris, http://dx.doi.org/10.1787/5jxrcmghmk0s-en.

Smith, S., V. Pang, K. Liu, M. Kavakli-Thorne, A. Edwards, M. Orgun and Host, R. (2016), "Adoption of data-driven decision making in fire emergency management", paper presented at the 24th European Conference on Information Systems (ECIS 2016).

Tuballa, M.L. and M.L. Abundo (2016), A review of the development of Smart Grid technologies, *Renewable and Sustainable Energy Reviews*, 59, June, pp. 710-725, http://dx.doi.org/10.1016/j.rser.2016.01.011.

Wendling, C., J. Radisch and S. Jacobzone (2013), "The use of social media in risk and crisis communication", *OECD Working Papers on Public Governance*, No. 24, OECD Publishing, Paris, http://dx.doi.org/10.1787/5k3v01fskp9s-en.

Case Study: PetaBencana.id

Bentley, C. (2016), "Need the latest news on flooding? In Jakarta, there's an app for that", *PRI*, 16 September 2016, www.pri.org/stories/2016-09-16/need-latest-news-flooding-jakarta-theres-app (accessed 13 December 2016)

Holderness, T. and E. Turpin (2016), "How tweeting about floods became a civic duty in Jakarta", *The Guardian*, 25 January 2016, www.theguardian.com/public-leaders-network/2016/jan/25/floods-jakarta-indonesia-twitter-petajakarta-org (accessed 6 January 2017).

Holderness, T. and E. Turpin (2015), *PetaJakarta.org: Assessing the Role of Social Media for Civic Co-Management During Monsoon Flooding in Jakarta, Indonesia*, White Paper, SMART Infrastructure Facility University of Wollongong, Australia, https://dl.dropboxusercontent.com/u/12960388/WhitePaper_vWeb.pdf.

Case Study: Extreme Weather App

Solomon, E. (2016), "Real-time dust storm forecasting", *Masdar News*, 18 July 2016, https://news.masdar.ac.ae/explore-news/stories-by-type/transformation/item/9277-real-time-dust-storm-forecasting.html (accessed 6 January 2016).

Naseema Beegum, S. et al. (2016), "Simulating aerosols over Arabian Peninsula with CHIMERE: Sensitivity to soil, surface parameters and anthropogenic emission inventories", *Atmospheric Environment*, vol. 128, pp. 185-197, www.sciencedirect.com/science/article/pii/S1352231016300188.

TREND 2

Daglio, M., D Gerson and H. Kitchen (2015), "Building Organisational Capacity for Public Sector Innovation," Background Paper prepared for the OECD Conference "Innovating the Public Sector: from Ideas to Impact", Paris, 12-13 November 2014.

Gibbs, S. (2016), "Chatbot lawyer overturns 160,000 parking tickets in London and New York", *The Guardian*, 28 June 2016, www.theguardian.com/technology/2016/jun/28/chatbot-ai-lawyer-donotpay-parking-tickets-london-new-york (accessed 6 January 2017).

OECD (2017), *Fostering Innovation*, OECD Publishing, Paris, forthcoming.

OECD (2016a), *Open Government in Indonesia*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264265905-en.

OECD (2016b), *Open Government: The Global Context and the Way Forward*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264268104-en.

OECD (2016c), *Digital Government in Chile: Strengthening the Institutional and Governance Framework,* OECD Digital Government Studies, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264258013-en.

OECD (2016d), *Survey on Strategic Human Resources Management in Central/Federal Governments of OECD Countries*, OECD Publishing, Paris.

OECD (2015), *The Innovation Imperative in the Public Sector: Setting an Agenda for Action*, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264236561-en

Mapatón MegaCities-ShortDocs (2016), "Mexico – Mobility – Mapaton Mexico City", www.youtube.com/watch?v=gTZhG4zaqV0.

Manuel, J. (2016), *Análisis del Mapatón CDMX*, Mi Diario Urbano, http://midiariourbano.blogspot.fr/2016/04/analisis-del-mapaton.html (accessed 7 December 2016).

OECD (2016), *Open Government Data Review of Mexico: Data Reuse for Public Sector Impact and Innovation*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264259270-en.

Pides Innovación (2016), *Mapatón CDMX*, www.pidesinnovacion.org/pdf/Caso-de-estudio_Mapaton.pdf (accessed 7 December 2016)

Sustainable Development Commission (2009), *Prosperity without Growth? The Transition to a Sustainable Economy*, http://www.sd-commission.org.uk/publications.php?id=914 (11 January 2017)

TREND 3

Antlöv, H. and A. Wetterberg (2011), *Citizen Engagement, Deliberative Spaces and the Consolidation of a Post-Authoritarian Democracy: The Case of Indonesia*, Swedish International Centre for Local Democracy, Working Paper No. 8, April, Visby, Sweden.

Daglio, M., D. Gerson and H. Kitchen (2015), "Building Organisational Capacity for Public Sector Innovation," Background Paper prepared for the OECD Conference "Innovating the Public Sector: from Ideas to Impact", Paris, 12-13 November, 2014.

OECD (2016a), *Open Government in Indonesia*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264265905-en.

OECD (2016b), *Open Government: The Global Context and the Way Forward*, OECD Public Governance Reviews, OECD Publishing, Paris.

OECD (2015), *The Innovation Imperative in the Public Sector: Setting an Agenda for Action*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264236561-en.

OECD (2011), *Together for Better Public Services: Partnering with Citizens and Civil Society*, OECD Public Governance Reviews, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264118843-en.

OECD (2009), *Focus on Citizens Public Engagement for Better Policy and Services,* OECD Studies on Public Engagement, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264048874-en.

OECD (2001), *Citizens as Partners: Information, Consultation and Public Participation in Policy-Making*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264195561-en.

Tetlock, P. and D. Gardner (2016), *Superforecasting: The Art and Science of Prediction,* Broadway Books, New York.

TREND 4

Bertot, J. et al. (2016), Universal and contextualized public services: Digital public service innovation framework, *Government Information Quarterly*, vol. 33/2, pp. 211-222, http://dx.doi.org/10.1016/j.giq.2016.05.004.

OECD (2017), *From Transactional to Strategic: Systems Approaches to Public Service Challenges*, https://hackpad.com/From-Transactional-to-Strategic-systems-approaches-to-public-service-challenges-Itulj4Bprmt, OECD Publishing, Paris, forthcoming.

OECD (2016), *Open Government: The Global Context and the Way Forward*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264268104-en.

OECD (2014), *Recommendation of the Council on Digital Government Strategies*, OECD Publishing, Paris, www.oecd.org/gov/digital-government/Recommendation-digital-government-strategies.pdf.

TREND 5

Accenture (2015), *Outlook: The Art of Managing Innovation Risk,* Accenture, London, www.accenture.com/t20150522T061601__w__/us-en/_acnmedia/Accenture/Conversion-Assets/Outlook/Documents/1/Accenture-Outlook-Art-of-Managing-Innovation-Risk.pdf#zoom=50 (accessed 9 December 2016).

Austin Fire Department (2015), *Rescue Robotics FAQ*. http://austintexas.gov/sites/default/files/files/Fire/Wildfire/RescueRobotics/REDTeamFAQs.pdf (accessed 5 December 2016).

Bhatta, G. (2003), *"Don't just do something, stand there!" Revisiting the Issue of Risks in Innovation in the Public Sector*, State Services Commission, Wellington, www.innovation.cc/scholarly-style/8_2_3_bhatta_innovate-risk.pdf (accessed 9 December 2016).

Breckon, J. (2015), *Better Public Services through Experimental Government,* Alliance for Useful Evidence, London, www.nesta.org.uk/sites/default/files/better-services-through-experimental-government.pdf (accessed 2 December 2016).

Casebourne, J. (2015), "Why we need an experimental government" *in* Nesta blog, Friday, 20 March 2015. www.nesta.org.uk/blog/why-we-need-experimental-government (accessed 5 December 2016).

Centre for Public Service Innovation (2015), *The 13th CPSI Public Sector Innovation Awards*, CPSI, Pretoria, www.cpsi.co.za/wp-content/uploads/2015/10/AwardsPublication2015Web.pdf (accessed 8 December 2016).

Hallsworth et al. (2016), *Applying Behavioural Insights: Simple Ways to Improve Health Outcomes*, World Innovation Summit for Health, Doha, http://38r8om2xjhhl25mw24492dir.wpengine.netdna-cdn.com/wp-content/uploads/2016/11/WISH-2016_Behavioral_Insights_Report.pdf (accessed 3 December 2016).

Haynes, L. et al. (2012), *Test, Learn, Adapt: Developing Public Policy with Randomised Control Trials*, Cabinet Office, Behavioural Insights Team, London. www.gov.uk/government/uploads/system/uploads/attachment_data/file/62529/TLA-1906126.pdf.

Hirschon Weiss, C. and J. Birckmayer (2008), "Social Experimentation for Public Policy" *in The Oxford Handbook of Public Policy*, Oxford University Press, Oxford.

Kettle, S. and S. Ruda (2016), "Increasing Tax Payments in Costa Rica" *in* Behavioural Insights Team blog, www.behaviouralinsights.co.uk/uncategorized/increasing-tax-payments-in-costa-rica/ (accessed 3 December 2016).

Lunn, P. (2014), *Regulatory Policy and Behavioural Economics,* OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264207851-en.

Mulgan, G. (2013), "Experimental Government" in *Nesta blog*, 8 March 2013, www.nesta.org.uk/blog/experimental-government (accessed 2 December 2016).

Nesta (2014) *Innovation Teams and Labs: A Practice Guide*, Nesta, London, www.nesta.org.uk/sites/default/files/innovation_teams_and_labs_a_practice_guide.pdf (accessed 9 December 2016).

Neuvonen, A. (2016), "Thousands to receive basic income in Finland: a trial that could lead to the greatest societal transformation of our time", in *Demos Helsinki Blog*, 30 August 2016, www.demoshelsinki.fi/en/2016/08/30/thousands-to-receive-basic-income-in-finland-a-trial-that-could-lead-to-the-greatest-societal-transformation-of-our-time/ (accessed 5 December 2016).

OECD (2015), *The Innovation Imperative in the Public Sector*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264236561-en.

République Française (2003), *Loi constitutionnelle no. 2003-276*, Assamblée Nationale, Paris, www.legifrance.gouv.fr/affichTexteArticle.

Rivera León, L., L. Roman and P. Simmonds (2012), *Trends and Challenges in Public Sector Innovation in Europe*, Brussels, DG Enterprise.

Samson, D. and M. Gloet (2013), *Innovation: The New Imperative,* Australian Institute of Management, Victoria and Tasmania, www.aim.com.au/sites/default/files/downloads/AIM-Research-Innovation-The-New-Imperative.pdf (accessed 9 December 2016).

Sahni, N., M. Wesseland and C. Christensen (2013), "Unleashing Breakthrough Innovation in Government", in *Stanford Social Innovation Review*, Summer 2013, https://ssir.org/articles/entry/unleashing_breakthrough_innovation_in_government (accessed 2 December 2016).

Shin, L. (2016), "Canada has been Experimenting with a Digital FIAT Currency Called CAD-COIN", in *Forbes*, 16 June 2016, www.forbes.com/sites/laurashin/2016/06/16/canada-has-been-experimenting-with-a-digital-fiat-currency-called-cad-coin/#4a428c261b0c (accessed 8 December 2016).

Vincent, J. (1996), "Managing risk in public services: a review of international literature" *in International Journal of Public Sector Management*, vol. 7/3, pp. 57-64.

Whitmore Schanzenback, D. (2012), "Limitation of experiments in education policy", in *Education Finance and Policy*, www.sesp.northwestern.edu/docs/publications/2136567975551eeb5641769.pdf (accessed 9 December 2016).

Case Study: Blockchain voting for peace

El Tiempo (2016), *Así Será La Votación Del Plebiscito Para Colombianos En El Exterior*, www.eltiempo.com/politica/proceso-de-paz/votacion-del-plebiscito-para-colombianos-en-el-exterior/16693493 (2 December 2016).

OECD (2016b), Interview with the project team of Democracy Earth, 1 December 2016.

OECD (2016c), "Future technology trends", in *OECD Science, Technology and Innovation Outlook 2016*, OECD Publishing, Paris, http://dx.doi.org/10.1787/sti_in_outlook-2016-5-en.

OECD/IDB (2016d), *Broadband Policies for Latin America and the Caribbean: A Digital Economy Toolkit*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264251823-en.

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Dear, A. et al. (2016), *Social Impact Bonds: The Early Years*. Social Finance, London, www.socialfinance.org.uk/wp-content/uploads/2016/07/SIBs-Early-Years_Social-Finance_2016_Final3.pdf.

McKinsey and Company (2011), *Better for Less: Improving Public Sector Performance on a Tight Budget*, July 2011.

OECD (2017), *Core Skills for Public Sector Innovation*, OECD Publishing, Paris, forthcoming.

OECD (2016), Public Procurement for Innovation, OECD Publishing: Preliminary print, Paris, www.oecd.org/gov/ethics/procurement-innovation-practices-strategies.pdf.

OECD (2016b), *Survey on Strategic Human Resources Management in Central/Federal Governments of OECD Countries*, OECD Publishing, Paris.

Red Cross/Red Crescent (2016), "Forecast-based financing", http://www.climatecentre.org/programmes-engagement/forecast-based-financing/ (accessed 16 January 2017).

Note: Other sources are included in figure and chart captions, boxes and footnotes throughout the report. For case studies, unless otherwise stated, the source was the information provided through the Call for Innovations and/or interviews with the relevant innovation teams behind the initiatives.

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Delivering Better Outcomes through Innovation

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مركز محمد بن راشد للابتكار الحكومي
MOHAMMED BIN RASHID CENTRE FOR GOVERNMENT INNOVATION

The MBRCGI works to stimulate and enrich the culture of innovation within governments through the development of an integrated innovation framework. The goal is for innovation to become one of the key pillars of the UAE government in line with the vision of H.H. Sheikh Mohammed Bin Rashid AlMaktoum, UAE Vice President, Prime Minister and Ruler of Dubai, which aims to develop government operations and enhance the UAE's competitiveness.

The World Government Summit sponsored this report and is dedicating it to shaping the future of government worldwide. Each year, it sets the agenda for the next generation of governments with a focus on harnessing innovation and technology to solve universal challenges facing humanity. It serves as a platform for knowledge exchange, leadership, networking, and analysis.

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The mission of the OECD is to promote policies that will improve the economic and social well-being of people around the world. This report has been developed through the OECD's Public Governance and Territorial Development Directorate (GOV), which works to help governments implement strategic, evidence-based and innovative policies to strengthen public governance and respond effectively to economic, social and environmental challenges.

As a part of GOV, the Observatory of Public Sector Innovation (OPSI) collects and analyses examples of government innovation to provide research and practical advice on how to make innovation work, and serves as a global forum for the exchange of innovative ideas.

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