Governing with Collective Intelligence

Tom Saunders, Geoff Mulgan

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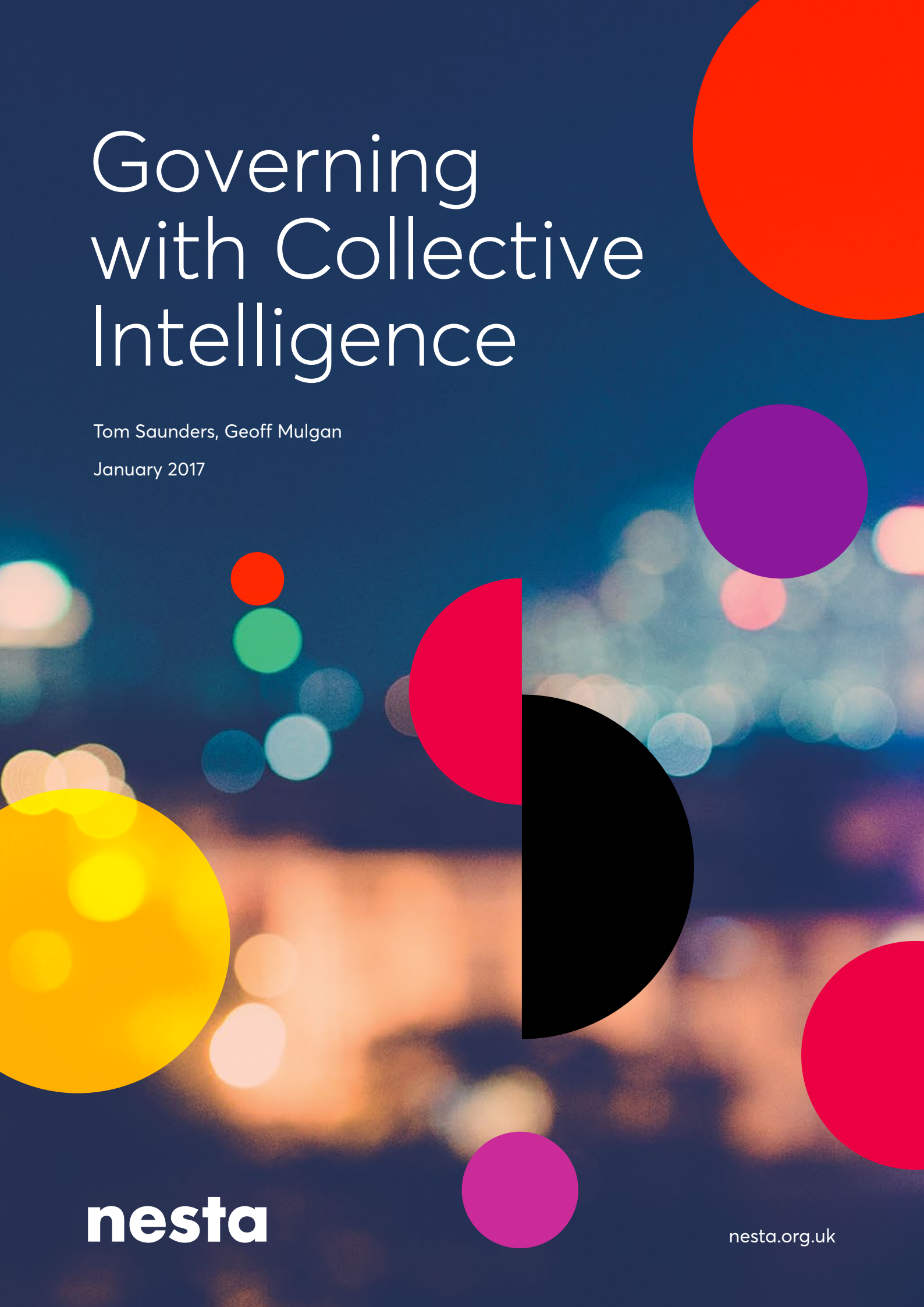

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Foreword

"After one look at this planet any visitor from outer space would say, 'I want to see the manager'."

William S. Burroughs was right. Few would look at the world today and give a thumbs up for the world's population acting intelligently as a collective. International development in its drive to advance freedom, rights and welfare is faced with some wicked challenges: countries are for the most part getting richer, but significant numbers of people living within their borders are struggling in poverty. And the route taken by the early industrialised countries to create wealth will likely no longer be viable given the planet's finite ability to cope with the side effects of carbon-driven growth. Preventable diseases still kill more than they should and new ones continue to emerge. While this is not an exhaustive list, there is still no one manager to complain to - billions of small decisions cumulate to form our collective sustainable development challenge today.

This paper responds to a broader intellectual effort to flip the coin and make the very decentralised nature of economic, social and political actions into an asset. Collective Intelligence is a theory (and a hope) that diffuse technology, smarter machines, hidden human talents and renewed participatory governance create an opportunity to solve public problems. Nesta has taken this body of theory and practice and arranged it into a pragmatic framework that demonstrates the aims and emerging methods for Collective Intelligence.

At the United Nations, we are faced with an important Collective Intelligence challenge for which we need such an operational framework. The sustainable development challenge is daunting and sits clearly at complexity level: wicked. No one person is in charge and while technology holds promise, the challenges and the solutions are both unevenly distributed. The good news is the global will is there. We now have a valuable tool - a set of sustainable development goals adopted by all countries of the world in 2015 and to be achieved by 2030.

The organisation I work for operates in 165 countries and brings together 32 arms of the UN to co-design strategies with governments and civil society partners. Many parts of the United Nations are innovating to create more transparent, inclusive and data-driven country programmes. We are working with Nesta to field-test Collective Intelligence as a framework for innovation in sustainable development and to help us do so together as a UN system.

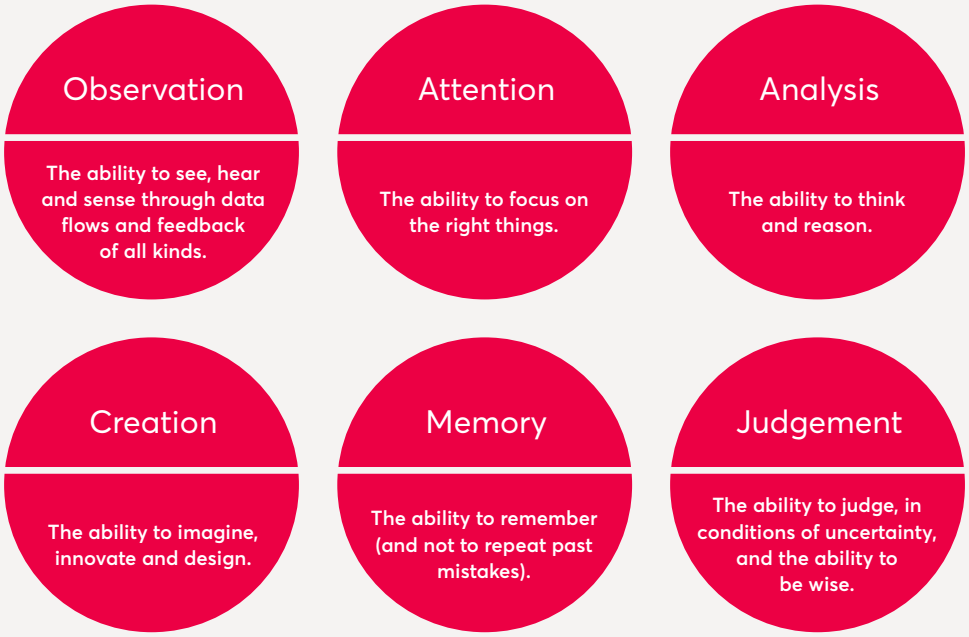
For those serious about applying Collective Intelligence to execute more accountable policies and accelerate market solutions to solve public problems this is an important, plain-spoken read. For those looking for ways to explain why innovation is needed, this paper makes it clear that innovation is not just the new and shiny tech for which we search for a use case, it can and should be used to make a dent in the challenges facing us as people and planet.

Gina Lucarelli
Team Leader, Knowledge and Innovation
United Nations Development Operations Coordination Office

1. The case for greater use of Collective Intelligence in government

This paper provides an introduction to Collective Intelligence in government. It aims to be useful and relevant to governments of countries at very different levels of development. It highlights the ways in which governments are better understanding the world around them, drawing on ideas and expertise from their citizens, and encouraging greater scrutiny of their actions.

Collective Intelligence is a new term to describe something which is in some respects old, but in other respects changing dramatically thanks to advances in digital technologies. It refers to the ability of large groups - a community, region, city or nation - to think and act intelligently in a way that amounts to more than the sum of their parts. This kind of intelligence depends on many things:



Adopting Collective Intelligence techniques is not always easy. Many governments resist openness and citizen input of any kind. Sometimes this is out of a sense that governments know best. More often it is because political organisations created many years ago lack the mechanisms to easily request, absorb, analyse and act upon ideas and information offered by citizens and external organisations.

That said, throughout history, the executive and legislative branches of governments and parliaments have sought outside opinion in a range of ways. This includes commissions that invite submissions on a given topic, select committees that invite people to give evidence, governments issuing draft bills for public discussion, citizens' dialogues, town hall debates and many more.[1]

During the 20th century, tools that enabled governments to expand their knowledge increased dramatically: new survey and statistical techniques, the telephone and the internet, to name just a few. Today, a new generation of digital platforms is making it easier than ever for governments to make use of the Collective Intelligence of citizens, employees and external experts, involving them in everything from policymaking to budgeting. Yet with national and city governments around the world experimenting with a range of digital technologies that seek to do this, it can often be difficult to categorise what is going on, or to understand which ones are truly useful.

Our analysis of Collective Intelligence initiatives around the world finds that activities fall into four broad categories:

1. **Better understanding facts and experiences**: The explosion of new digital tools enables governments to gather data from many more sources, some generated proactively by citizens (crowdsourcing data on everything from air quality to poverty via smartphone apps), some deriving from businesses (e.g. mobile phone networks revealing travel patterns or economic activity) and some generated automatically, e.g. by sensors.
2. **Better development of options and ideas**: Governments can tap into the collective brainpower of citizens to come up with better ideas and options for action. These methods can aim to be very inclusive (for example, consulting residents on major decisions relating to urban planning in their area), or focus primarily on people with specific expertise. They tend to work best with quite active curation since most ideas start their life relatively unformed, and ill-suited to government action.
3. **Better, more inclusive decision-making**: Decision-making and problem solving are usually left to experts, yet citizens are often well placed to make decisions on issues that will affect them. New digital tools make it easier than ever for governments to involve citizens in policymaking, planning and budgeting. A number of city and local governments have also opened up parts of their budget for direct citizen decision-making.
4. **Better oversight of what is done**: From monitoring corruption to scrutinising budgets, the rise of open data and digital tools allows broader involvement in the oversight of government activity, helping to increase accountability and transparency.

As governments around the world consider how they can address major challenges such as reforming public services and tackling citizen disengagement with traditional political institutions, we believe there are significant opportunities to experiment with these four areas and develop coherent policies that are data- and evidence-led, learn quickly, and respond to the real and changing needs of their societies. Used well, they offer the chance to reach beyond government silos to improve the quality of decision-making and action, and increase public trust and engagement.

Based on our research, we offer cities and national governments eight recommendations on how to use digital tools to make the most of Collective Intelligence. Here is a summary of our recommendations. They are discussed in full at the end of the report.

1. Ensure Collective Intelligence methods are applied ethically.
2. Start with a problem, not a technology project.
3. Reuse and build on existing knowledge and networks of expertise.
4. Choose the right crowd for your problem.
5. Keep it simple: Start with the basics and build the support, skills and momentum for more ambitious initiatives in the future.
6. Integrate Collective Intelligence into existing government processes.
7. Don't forget skills: Governing with Collective Intelligence will require policymakers to become familiar with new types of information, tools and processes.
8. Remember that there is a world beyond the internet.

2. What can governments do with Collective Intelligence?

This section explores the four areas where government can apply Collective Intelligence. Each category includes a series of examples where digital tools have been used.

2.1. Better understanding facts and experiences

To be able to best target their resources, governments need a good understanding of what is going on and what issues people care about. Since their very earliest incarnations, governments have used a number of methods to collect this information: from intelligence reports to visits and gatherings. More recently they have used everything from focus groups to surveys and censuses.

What governments increasingly want is useful data that is cheap to gather, timely, and combines quantitative and qualitative elements. However, many traditional methods of data collection are highly accurate and comprehensive but not very timely; a national census being a case in point. These traditional methods of data collection can also be very expensive: the budget for the 2011 UK census was £480 million.[2]

Demands for quicker and cheaper methods are driving a considerable amount of innovation in the collection of statistics by governments. In 2012 New Zealand began its Census Transformation Programme, which is mainly focused on moving to a census based on the administrative data already held by various government agencies, rather than a decennial survey.[3] Other agencies are experimenting with techniques from web scraping and text mining to natural language processing and developing more efficient ways to collect data face-to-face.

Alongside optimising existing processes, many digital tools can help governments make use of new forms of citizen generated data. These tools can be classified by the level of involvement of the individual in generating the data.[4] There are passive ways of monitoring citizen generated data streams, such as mobile phone location data and social media analysis. And there are more active forms of data contribution: reporting tools, new ways of conducting surveys and self assessment tools. Alongside potentially making data gathering cheaper and quicker, these tools can be used as part of a participatory process that can help citizens shape policymakers' views of what is important.[5]

Passive data collection

In this section we discuss how governrents can use mobile phone location data, social media data and other forms of online data to better understand social problems.

Citizens as sensors

Globally, over 4.7 billion people had a mobile phone subscription by the end of 2015.[6] While far from being universal, location data generated by people carrying mobile phones - network data, GPS data or Bluetooth and WiFi beacon data - is increasingly being seen as a useful resource for everything from urban planning to health management, and from traffic modelling to planning interventions that support businesses.[7]

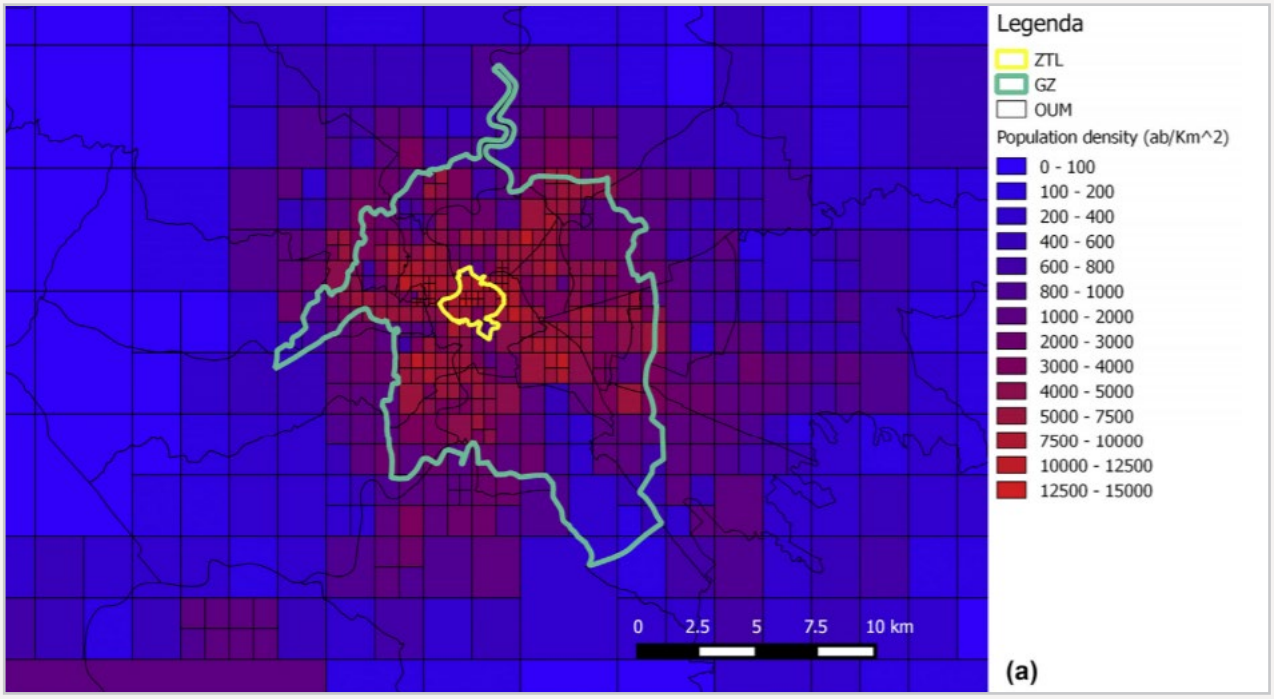
Many of the uses of mobile phone location data are experimental, rather than tools which governments can currently use for planning purposes. However, transport planning is an area where many governments have successfully used this data. Seoul city designed the routes of its night bus, branded the Owl bus, based on an analysis of night-time mobile phone location data.[8] In a similar way, governments can use data collected by companies like Apple and Google, which gather mobile phone data based on their users' GPS signals. Google uses this information to create their popular traffic app, **Waze**, and through its Connected Citizens Program it shares data with ten cities around the world, including Jakarta and Tel Aviv, to help them better understand traffic conditions.[9]

Other forms of passively generated data are also useful for government planning. Electronic payments data from companies like MasterCard and Visa can also reveal how citizens interact with cities. By looking at where and on what people spend their money, and where they originate from, governments can seek to, for example, measure business demand and optimise the supply of public transport infrastructure, better target business support schemes, develop real-time models of economic activity, and monitor changes in tourists' spending habits.

As the amount of available passively-generated data continues to grow, it has become clear that supply has outstripped demand and organisations that hold this data are struggling to come up with ideas for its use. There are a number of reasons for this, including a paucity of data science skills among public servants and a lack of creative thinking around the use of this data for government planning purposes.[10] To address the former issue, governments around the world are setting up data science training academies, a prominent example of which is the UK government's Data Science Accelerator.[11]

To generate ideas for the use of these new types of data, companies which hold this data are turning back to the crowd. For example, several telecoms companies are opening up their data and asking startups and researchers what uses they can find for it. One recent example is Telecom Italia's **Big Data Challenge 2015**, which saw one winning applicant use mobile phone data to measure population exposure to air pollution in Milan.[12] Another example is the **Data for Development Challenge Senegal**, run by telecom company Orange, where anonymised data was made available to 250 researchers around the world.[13] Winning projects included the use of mobile phone data for electrification planning and a project looking at the effect of human mobility on disease transmission.

Governments themselves have also organised competitions as a way to find creative uses for new types of data. One recent example is the **Sheffield Smart Lab**, a programme designed to bring together entrepreneurs with innovative ideas with a city environment within which they can pilot them. One of the winners of the competition was **G.A.P.S**, a project by Movement Strategies, which used a number of sources of location data including mobile phone network data and guest WiFi network data to create a new planning platform for Sheffield City Council.[14]



Mapping exposure to air pollution

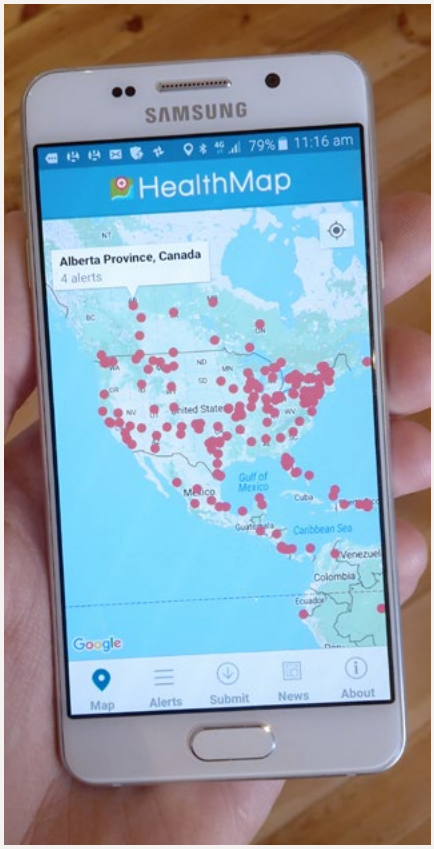
Researchers are experimenting with the use of mobile phone location data to map everything from exposure to air pollution in cities to the transmission of diseases.

Social media

Social media can also be used by governments to improve their planning processes. Research for Nesta's Alliance for Useful Evidence has found that social media *"offers a rapidly growing opportunity to overhaul and significantly enhance the process by which government understands society and the impact of its policies."*[15]

One example of an organisation trying to put these ideas into practice is the **UN Global Pulse Lab**, which has analysed social media for conversations about immunisation programmes in India, Kenya, Nigeria and Pakistan to understand the impact that campaigns have on public understanding of these programmes.[16] Social media data is also starting to be used for predictive purposes. For example, the UK's Food Standards agency uses tweets about symptoms that are related to the foodborne disease Norovirus to predict significant rises in the number of recorded cases.[17]

At a more operational level, governments can use social media to augment existing data collection initiatives. For example Jakarta, the capital of Indonesia, has recently started to experiment with crowdsourced flood reporting via Twitter. **PetaJakarta**, a joint project between researchers at the University of Wollongong in Australia and the Jakarta provincial government, uses tweets about floods to create a real time, crowdsourced map of flooding in the city. An innovative feature of the platform is its partnership with Twitter:



HealthMap

Using online data, from web searches to social media data, researchers can create accurate maps of disease outbreaks. HealthMap is an App and website which allows users to find out about disease outbreaks near them.

If a resident of Jakarta tweets the word 'flood', Twitter sends them a message asking for verification. Only after the message is verified is the report added to the crowdsourced map. The Jakarta Emergency Management Agency BPBD is now trying to integrate the system into its existing workflow.[18]

Bringing the various forms of passively-generated data together - from social media to location data has also proved to be a useful technique. **HealthMap** is a platform that uses online sources to monitor the outbreak of diseases. Developed by a team of researchers at Boston's Children's Hospital in 2006, the website and app bring together data from online news aggregators and social media platforms to produce real-time intelligence on the current global state of infectious diseases. A notable early example of the use of HealthMap was in tracking cholera in Haiti after the 2010 earthquake. The real-time nature of the platform represented a significant advance in intelligence, as subsequent analysis confirmed significant correlation between the picture provided by HealthMap and the picture provided by official data from health agencies - the difference being that official case data was typically not available until two weeks after the first outbreak.[19]

Active data collection

Alongside collection of data which doesn't require an active contribution from citizens, there is a range of tools that allow citizens to choose to contribute data: reporting tools, new survey techniques and self-assessment tools.

Reporting tools

Citizens have always been able to report issues to their governments - from potholes to corruption - on the phone, in writing, or at community meetings. However, this frequently requires more time than most citizens are willing or able to spend. Now, a number of digital tools are available, which make it easier for citizens to report issues.

Taking their lead from **FixMyStreet**,[20] a website set up in 2007 by the NGO MySociety, many governments have set up reporting systems. Examples include **Lapor!** in Indonesia, a service which Indonesians can use to submit complaints about public services.[21] The system, which receives over 500 complaints per day, is closely integrated into the machinery of government. The Lapor team works closely with liaison officers within government departments, thereby ensuring that complaints are acted upon, addressing a flaw of many similar systems.[22]

In addition to reporting maintenance issues, citizens can use issue–reporting systems for a range of other purposes. In India, women can use **SafeCity**, a crowdsourcing website and mobile app, to report sexual assaults. Official data shows that reports of sexual abuse around the country climbed by 875 per cent between 1971 and 2011. SafeCity provides a platform for anyone to share personal stories of sexual harassment in public spaces.[23] The aggregated data is then mapped, allowing citizens and governments to better understand crime trends at hyperlocal levels. Since its launch in 2012, SafeCity has received more than 4,000 reports in more than 50 cities across India and Nepal.

SafeCity

People use reporting apps to do more than just report potholes to their city governments. In India, women can use the SafeCity app to report sexual assaults.

New ways to conduct surveys

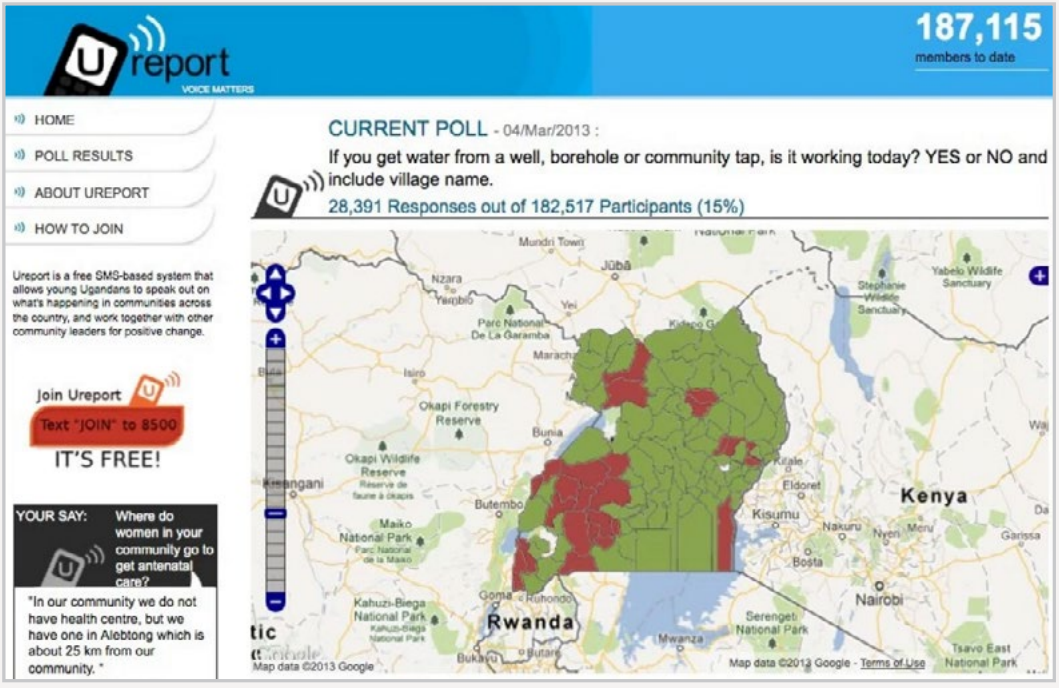
Traditionally, the way to find out about issues that affect citizens is to conduct household surveys. These surveys have the virtue of being highly accurate, as they are expertly planned and executed, but they are not timely. In some countries it can take anything up to three years for the whole process to play out. The main drawback is that once analysed, the survey is long out of date when it is presented. This lag means that governments don't have visibility of what issues people are facing, and can't provide a timely response to what people think.

One way around these challenges is to conduct regular micro-surveys. The World Bank's **Listening to Latin America** and **Listening to Africa** projects were designed to monitor the wellbeing of residents through regular mobile phone surveys. The main benefit of such an approach is that it allows governments to rapidly take the pulse of citizen sentiment on a range of issues. The projects are also exploring a range of challenges that this new form

of data collection has given rise to, from how to structure incentives, and how to ensure representative samples to how to ensure the high quality data is collected.[24] A further advantage of these projects is that unlike many new survey initiatives which are designed primarily as a campaigning tool, these projects were set up as partnerships with the government statistical agencies in each country and the ultimate goal is to incorporate the new data into existing government workflows.[25]

One concern with traditional surveys is that they miss hard to reach groups, such as young people.[26] **U-report**, a project by Unicef, is designed to overcome this through a weekly SMS poll of young people in 20 countries around the world. Launched by Unicef Uganda in 2011, the platform now has over one million registered users.[27] In addition to a weekly poll, the U-report platform is used as a two-way channel, using the data it collects to provide advice about local services and programmes.

Alongside collecting opinions and perceptions, online surveys can be used to inform public service planning and delivery. **GripeNet.es** is a platform which enables real-time monitoring of flu in the Spanish population through collaboration of anonymous volunteers via the Internet. During flu season, registered volunteers are asked to report on their symptoms (or lack of them) through a weekly survey. Unlike traditional methods of disease monitoring, Gripenet collects data directly from the affected, unmediated by medical professionals. This feature is particularly advantageous because it enables the collection of data about those who are reluctant to seek medical attention.



U-report

Micro-surveys are becoming an increasingly important tool for rapidly taking the pulse of citizens. U-report, a Unicef project originally founded in Uganda, is now used in 20 countries and allows the UN to understand the priorities and concerns of young people.

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Self-assessment tools

Typically, a survey is conducted based on questions thought up and assessed by experts. A key drawback of this method is that citizens may not feel motivated to take part. A better strategy may be to empower people to assess their own situations and provide them with a tangible benefit for doing so.

One example of this idea in practice is **Poverty Stoplight**, a project by Fundación Paraguaya, an NGO in Paraguay which asks families to assess their own poverty against 50 different indicators, from employment to housing. The self-assessment is administered as a 30 minute online test. The indicators they can choose are Red (extreme poverty), Yellow (poverty) or Green (not in poverty). After assessing their own circumstances, families then work with project staff to design a poverty elimination plan, helping authorities crowdsource ideas about how to deal with their problems. The project also points respondents towards services that they can access in the area to help address the issues they face. An added benefit of the project is that it helps authorities create a comprehensive poverty database, which it can use to map and analyse the situation of families across the country.[28]

Poverty Stoplight

Self assessment tools such as Poverty Stoplight offer a simple way to assess poverty against a number of visual indicators.

2.2. Better development of options and ideas

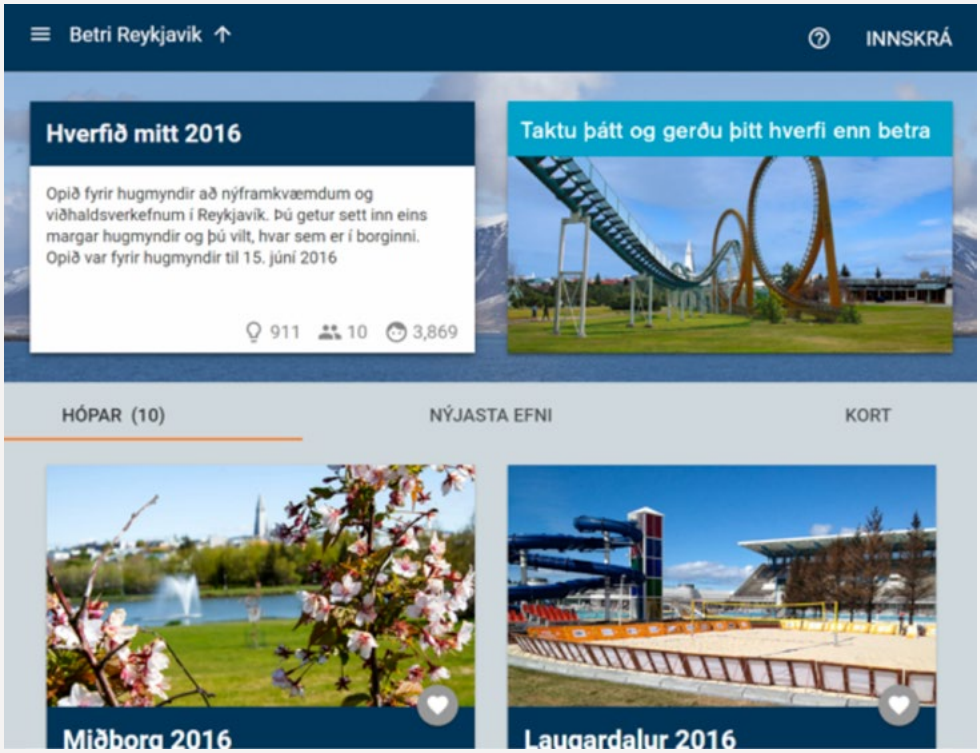
Beyond sensing and data collection, governments can engage more deeply with citizens to collect their ideas and involve them in decision-making. Some of these methods aim to capture the views and voices of citizens in more sophisticated ways than the choices provided by elections; others aim to tap into networks of specialist expertise.

Many past proposals tried to give the public powers of decision-making through perpetual online referendums – yes/no choices on decisions being made by a parliament or government. These often turn out to be poor ways of either reflecting the public's views, or of making coherent decisions. Democracy is not just about public votes – it's also dependent on the complex ecology of independent media, civil society, social media and intermediary institutions that help to mobilise knowledge. There is also limited utility in allowing citizens to express an opinion on issues in isolation. As Californian referendums have taught us, if you ask the public to express their views on single issues, they will demand their cake and eat it, voting for lower taxes and greater public spending. So the best recent methods, as described below, have tried to build in more deliberation and iteration rather than replicating the 'like/don't like' tools of social media.

Many governments have experimented with calling on their citizens for ideas. The Singaporean government uses its **eCitizen ideas** website to regularly call for ideas on defined themes, on everything from enhancing the island's natural environment to innovative interventions to promote health and fitness.[29] The fact that the government has chosen defined categories on which to invite citizen engagement means that there is a much greater chance that the feedback will be incorporated into government processes.

Another innovative way to collect ideas is through **challenge prizes**, which offer a reward to whoever can first or most effectively meet a defined challenge, but can also be used to identify ideas from a wide range of sources, helping to source ideas from more than just the 'usual suspects' of consultancies, businesses and lobbying firms. For example, Nesta's Challenge Prize Centre runs challenge prizes on issues ranging from antibiotic resistance to the needs of disabled people, and from the integration of refugees to better services for small businesses. Anyone can offer potential solutions, with the most promising ideas given support to develop, and the one that works best given substantial rewards. Similar prizes have been used within public services.[30]

There is a lot of evidence that deliberation and debate lead to much better ideas than a simple digital suggestion box model offered by many crowdsourcing initiatives. Governments can now use a wide range of digital tools to empower citizens to debate issues. **Better Reykjavik**, developed by the non–profit Citizens Foundation in Reykjavik, Iceland, enables groups to collaboratively develop ideas for improving the city and its services. Individuals propose ideas on the site, which are then debated and voted on. The most popular ideas, ten to 15 each month, are evaluated by the city council and the ones that are deemed feasible are then put to a vote on the platform, with the winning ideas executed by the city council. The city of Reykjavik funds these ideas using its Better Neighbourhoods programme, which allocated €2 million per year between 2012 and 2016 to projects based on ideas from citizens.[31] Projects funded by the initiative include everything from children's parks to community gym equipment.



Better Reykjavik

Deliberation and debate often lead to much better ideas than simply setting up a digital suggestion box. Better Reykjavik is a platform that helps the city council in Reykjavik, Iceland crowdsource ideas for the development of city. Since 2011, over 100 ideas have been accepted by the city council.

A large part of the success of initiatives like Better Reykjavik comes from their political buy in. Similarly in 2012, civil society groups in Estonia, with the backing of the president, set up **Rahvakogu** (People's Assembly), to crowdsource citizen ideas for amendments to Estonia's electoral laws, in the wake of a series of political scandals. After thousands of proposals were submitted online, 550 randomly selected citizens were invited to take part in a deliberation day to discuss the pros and cons of a number of proposals that were deemed feasible by the government. As a result, 15 proposals were presented to the president and three were implemented.[32]

Other initiatives enable citizens to become much more involved in the detailed drafting of policy and legislation. **Open Ministry** was a project that ran between 2011 and 2015 in Finland which helped turn crowdsourced citizen ideas into pieces of legislation. The project had one major success - getting parliament to pass a piece of crowdsourced legislation that makes it possible for same–sex couples to get married. Beyond this single piece of legislation, the value of the project lies in the process that it developed to link citizens with ideas to those with experience of creating professional legislation.

Using technology to link communities with ideas to experts with professional knowledge has been useful in other fields. The **Resilience Dialogues** were a set of facilitated discussions in the US designed to help communities create climate action plans. Ideas from communities were matched with expert knowhow through a series of online discussions. Local knowledge, combined with prompts from experts about the resources needed for various ideas and the likely outcome of particular proposals led to much more robust proposals than either of these groups could have produced in isolation.[33]

Digital tools can also enable citizens to propose and debate ideas for the physical infrastructure of their communities. Many of the most interesting digitally enabled participatory planning initiatives come from from outside of government. **Next Bengaluru**, an initiative by an NGO in Bangalore used online and offline methods to create a community vision for the redevelopment of one neighbourhood in the city.[34] Between December 2014 and March 2015, 600 ideas were submitted by residents. A key outcome of the campaign was the identification of abandoned urban spaces as a major source of concern for residents as they are often used as places to dump rubbish. Residents were then asked to help create an online map of these spaces, to start a conversation with city officials about what could be done about them.

Beyond the standard set of tools such as online debating forums, a number of creative approaches have been used to develop options and ideas. One interesting example is **Block Holm**, a project in Sweden that used the Minecraft computer game to enable people to build their ideas on empty plots in Stockholm. The game designers imported real city data into the game to create a very accurate representation of the capital. In the first six months after its launch in 2013, 10,000 Block Holm plots were built. A jury then selected ten of the most interesting, built them as 1:5 scale models and displayed them at a public exhibition.

Block Holm

Traditional urban planning systems are not very user-friendly. Games are one way to encourage citizen participation. In Sweden Minecraft, a game described as 'virtual Lego', was used to encourage citizens to build their own vision for the city.

2.3. Better, more inclusive decision-making

Alongside providing governments with better data and better ideas, many projects have aimed to use digital platforms to involve citizens directly in making decisions about the policies and laws that affect them. These types of initiatives are often external to government, organised by NGOs, community groups or political parties, and as such their primary function tends to be campaigning and advocacy. Often, as described above, initiatives that describe themselves as decision-making platforms are actually about idea generation: citizens propose, debate and vote on bills, which are then sent to national legislatures for their consideration, the idea being that debate and deliberation will produce better ideas, but actual decision-making is left to elected representatives.

Initiatives that try to go beyond this model usually aim to facilitate group decision-making outside of government. **Loomio** is an open-source software created by a company in New Zealand. It is used by the FairShares Association, a grouping of social enterprises, to propose, debate and make decisions about a range of issues. The site has been particularly useful for facilitating multi-language debates.[35] Similarly, political parties have also used digital technologies to facilitate group decision-making, for example the German Pirate Party uses **LiquidFeedback** for internal party decisions and elections.[36]

LiquidFeedback

A number of digital platforms help large groups of people, such as political parties, make informed decisions. The key to these platforms is their ability to facility debate, which often leads to much better contributions and ideas.

Similarly, tools created for Nesta's European-wide **D-CENT** project, were used by political parties in Spain, including Podemos nationally and Guanyem Barcelona at the municipal level. The open-source tools created for these organisations have been used variously to enable internal party decision-making and to empower citizens to propose and make decisions about elements of their manifestos.[37]

Another interesting set of initiatives involve participatory budgeting - involving citizens in spending decisions. This started in the Brazilian city of Porto Alegre in 1989 and has been used to fund a huge range of projects around the world ever since, from water supply networks in Ilo, Peru, to allotments in Seville, Spain, and lamppost refurbishment in San Antonio, Chile. New digital tools offer governments the chance to engage even greater numbers of people in budgeting processes. In 2014, the Mayor of Paris, Anne Hidalgo launched **Madame Mayor, I have an idea**, a participatory budgeting exercise which will allocate €500 million to projects proposed by citizens between 2014 and 2020, and claims to be the largest exercise of its kind in the world. The pilot phase of the campaign received over 5,000 proposals. While votes and proposals can only be submitted online, the campaign also organised meetings across the city to ensure that older people aren't left out. Budgets for the project have been divided among the 20 districts in Paris based on economic need, with the poorer, outer suburbs being allocated 15 times the amount put aside for central Paris.

Like participatory budgeting, crowdfunding – where large groups of people collectively fund projects through small financial contributions – can be used by governments to harness the Collective Intelligence of large groups. Sometimes this starts from citizens, for example in Rotterdam citizens used a crowdfunding campaign to signal to government the need for a new footbridge to connect two parts of the city cut off by a busy road and railway line. The bridge project, called Luchtsingel, then attracted funding from the city government in order to complete it. Governments can also use crowdfunding to involve citizens in deciding which of a number of projects it should fund. This was the case in Milan which launched a €400,000 fund in 2015 which covers half the costs of a series of socially–orientated projects.

2.4. Better oversight and improvement of what is done

Many attempts to harness Collective Intelligence in a democratic context are based on the ideals of direct democracy: the idea that citizens can, and want to, make decisions directly about policies and laws, rather than decisions being made for them by elected representatives. However, in the context of representative democracies, oversight and monitoring tools are one of the most tangible ways that Collective Intelligence can be applied, by governments, citizens and citizen groups.

Since the 1940s, organisations have existed that monitor the activity of governments in the context of human rights.[38] The rise of open data and digital tools allows broader involvement in the oversight of government activity and coverage of a broader range of areas, from corruption and elections to budgets and programme evaluation, helping to increase accountability and transparency.

Election observation has grown rapidly in the past 20 years, with estimates that almost 80 per cent of elections in countries classed as non-established democracies are now monitored by international organisations.[39] The gathering of statistics involves a large number of people visiting polling stations to determine whether they are open and whether the voting is secret and fair. Digital tools can help ensure that election observation is done accurately, an important issue given the influence that election reports have on the willingness of citizens to accept results. To enable this, the Carter Centre has developed an open source system called **ELMO** (from ELection MOnitoring) that allows real-time collection of data using tablet computers.[40] This technology makes election monitoring more efficient and in 2014 allowed Carter Centre observers to visit approximately 100 more polling stations than at the previous election.[41] It also allows election reports to be generated much more rapidly. Alongside this, the open source nature of the software means that organisations in any country can use it to monitor elections themselves and civil society organisations in Myanmar were recently trained in how to do this.[42]

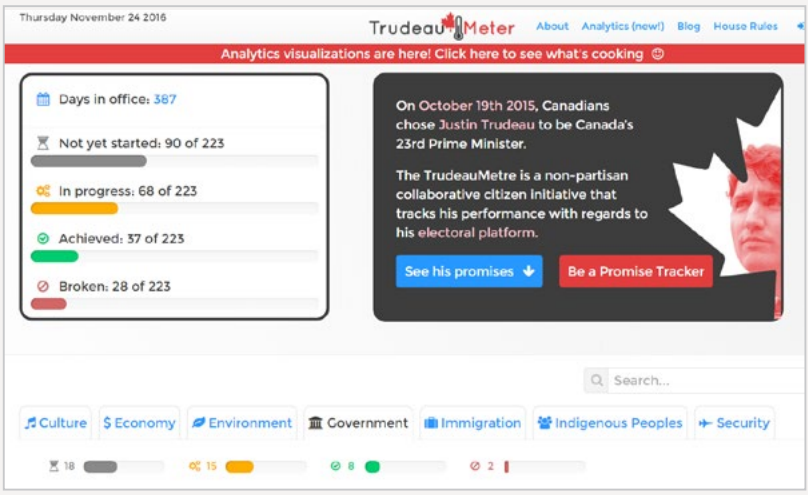
There are also several platforms that allow ordinary citizens to take part in election monitoring. **Ushahidi**, the Kenyan not for profit company that creates crowdsourcing platforms used its technology to help civil society organisations monitor the 2013 Kenyan elections. Since then the technology, which is based on SMS or online reports which are then verified and placed on a map by volunteers, has been used in a number of other countries including Mozambique.[43]

Once elections are over, Collective Intelligence can be used to monitor the activity of governments. For example, the UK parliament monitoring website **TheyWorkForYou** monitors a large amount of indicators, from attendance in parliament by MPs to the way that MPs vote. Examples from developing countries include **Mzalendo** (eye on Kenyan parliament), which performs a similar function.[44]

Many organisations around the world have also set up websites to track the performance of politicians in relation to their electoral platform. For example **TrudeauMetre** in Canada tracks the performance of prime minister Justin Trudeau in relation to his electoral promises.[45] The website tracks 550 commitments and relies on volunteers to sign up to be promise trackers and to post updates about the status of these promises (not yet started, in progress, achieved or broken), based on news and official government publications.

Collective Intelligence can also be applied to monitor the way government spends money. Between October 2011 and September 2012, the estimated loss to the Indian economy from corruption reached around £4 billion and India ranked 85 out of 175 countries in the 2014 Corruption Perceptions Index. The country is increasingly aware of the negative effects this has on its development, and new solutions to fighting corruption like **IPaidABribe** are

gaining momentum and popularity. Using a website and mobile app created by grassroots non-profit organisation Janaagraha, citizens can contribute towards tackling corruption by anonymously reporting situations in which they were asked to pay a bribe, feeding into city, state and country-level databases of corruption in public services. Today, more than 47,000 reports have been filed on the website in over 630 cities across India. Most reports are about officials and bureaucrats asking for illicit payments for routine services, paperwork and official forms. Janaagraha has now opened up the source code of the tool to help other countries to fight corruption.



TrudeauMetre

Citizen monitoring of the activity of governments can often lead to more efficient delivery of government programmes. Citizens in Canada can sign up to become a volunteer to monitor and track the peformance of Prime Minister Justin Trudeau.

There are a number of reasons why governments might be willing to partner with citizens on these kinds of initiatives. In many countries, trust in government spending is low and consequently tax avoidance is high. To combat this problem, the Tanzanian government launched its **Citizens Budget Handbook** to improve citizen trust in government spending, and consequently persuade more people to pay taxes. The handbook is an annual simplified digest of the national budget. It uses jargon-free language and easy to understand diagrams to explain the government's financial plans for the coming year.[46]

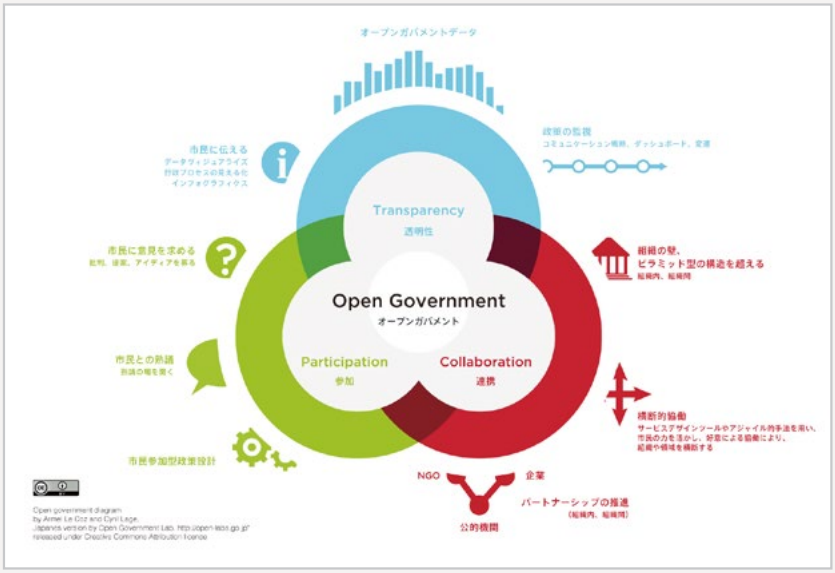
Alongside budgets, Citizen monitoring of government programmes can also lead to a reduction in the corrupt use of public funds. In Kenya, the Centre for Law and Research International trained community members to become social auditors. They then monitored and audited seven projects that took place across the country and found evidence of significant corruption. The organiser estimated that as a result of the audit process the number of projects that were completed increased by 15 per cent and corruption in new projects decreased by 20 per cent.[47]

Another way that governments can encourage the collective monitoring of their activity is through releasing data as open data. Opening access to government data is now a fairly common activity.[48] Some countries – including Slovenia and the UK - are now going one step further and introducing legislation which requires companies to open up data, in suitably anonymised forms, as the default option. One example of the power of Collective Intelligence to address corporate corruption is **OpenCorporates**, a platform which was set up after the financial crisis to make information about companies and the corporate world more transparent and accessible. It has since grown to become the largest open database of companies in the world, including data on 60 million companies and their subsidiaries. OpenCorporates is widely used by journalists and governments seeking to understand global corporate structures and investigate bribery and corruption.[49]

3. Better linking into a coherent strategy

Where governments have used digital tools to access Collective Intelligence, they have more often than not been small scale, often one-off pilots run by one government department. What would a more wholehearted embrace of the concept of Collective Intelligence by government look like?

Open government strategies are one way that governments are coming to embrace Collective Intelligence.[50] The two most common elements to appear in open government strategies are transparency and accountability (including open data) and public engagement, which are both seen as ways to improve governance.[51]



Japan open government strategy

Many governments have launched open government strategies in the past few years. These strategies usually include transparency and citizen participation as measures to improve oversight of the government's activities.
Image by Armel Le Coz and Cyril Lage. Licence CC BY

A number of tools have also been created to help governments create better, more coherent strategies. At their best these strategies respond to the most important needs of the society; they involve many people in formulating them; are explicit and transparent; and involve visible learning, adjusting in response to events, successes and failures.

Some of the best examples worldwide have been at the level of provinces and states as well as national governments. For example, Oregon Benchmarks was a bi-annual publication detailing the state's progress against a number of indicators between 1989 and 2009. The publication included over 100 indicators on everything from teen

pregnancy and education to skill levels and air quality. The Collective Intelligence element of Oregon Benchmarks is the ability it had to use the data to promote cooperation among various government and non-governmental agencies to address societal challenges that are too complex for the government to address on its own.[52]

A current example that has been working successfully for over a decade, is the government of South Australia's Strategic Plan, which is designed to help individuals, community organisations, the government and businesses make better, more informed decisions about issues that affect the wellbeing of residents. The Plan builds on extensive consultation, and sets 100 measureable targets that are regularly updated. These are regularly and publicly reviewed to see if they are on track and to provide an analysis when they're not.[53]

The potential for leapfrogging models of public administration

Leapfrogging is often discussed in the context of the environment: the skipping of the natural resource intensive, polluting stages of development, and also in terms of 'technological leapfrogging', where developing countries skip an earlier stage of technology roll out, e.g fixed line communications, and instead go straight for the next level of technology, in this case mobile networks.[54] For our purposes, the question is whether governments in middle income and developing countries can, by adopting a mix of technologies and innovative organisational methods that facilitate the use of Collective Intelligence, skip budget intensive phases of development to achieve equal outcomes?

There are some examples of this happening. Since 1989, Estonia, then a relatively backward part of the Soviet Union, has put in place the world's most advanced digital government, covering everything from voting to tax collection and Cabinet meetings. This digital infrastructure allows Estonia to harness Collective Intelligence in a number of forms, including online participatory budgeting in Tartu, Estonia's second city.[55] Other examples include India's MY UID card, which now reaches over one billion people, and has leapt ahead of most developed countries with an infrastructure that simplifies service access, reduces corruption and provides a huge flow of public data.

My UID card

Digital technologies provide an opportunity for governments in developing countries to 'leapfrog' their peers. India's My UID card is a universal ID card that links up a number of services and gives the government access to large amount of data.

More experimentation is required in a developing country context to test whether a more systematic approach to the use of Collective Intelligence can enable governments to leapfrog their peers. The following section describes how governments might do this.

4. Recommendations for applying Collective Intelligence techniques

As described in this paper, there is a huge range of initiatives where digital tools have been used to gain access to Collective Intelligence. In the past, many have been developed outside government, for example by NGOs as lobbying tools or by academics as research tools. How can governments determine how to apply Collective Intelligence to their own challenges? There are many challenges related to the incorporation of these techniques into existing government process, ranging from the cultural aversion that many organisations feel to new technologies through to the new skills that are required to make use of Collective Intelligence, whether these are hard skills around data science or softer skills around collaborative working.

The first step is to recognise that Collective Intelligence is no cure-all: it cannot address every issue that governments face. So how do you work out where it has something to contribute? Our work suggests answering that question requires clear thinking about the problem to be addressed, the new action you hope to enable and the intelligence you hope to gain access to.

The problems that governments can apply Collective Intelligence to fall into two categories: **issues within government** where processes and decisions are hindered by a lack of data, a lack of ideas or a lack of oversight; and **problems out in the world** where a lack of ideas and information about a situation, for example outbreaks of flu, prevents smart interventions. In each of these cases, the deciding factors about whether Collective Intelligence can be usefully applied are:

- Do you have a specific, clearly defined problem and corresponding solution you want to enable?
- Can you think of the types of input that you need to enable that solution?
- If seeking active contributions from a large number of people, is there a community that cares enough about the issue you are trying to address to engage with your initiative? If seeking passive engagement (e.g. mobile phone data), does enough of the data exist to make collecting it useful? And can you negotiate with the owner of that data to make it available?

1. Consider the ethics of Collective Intelligence

Tools that enable governments to make use of Collective Intelligence have the potential to be very powerful, and can be both used or misused. To ensure they are used ethically, governments should be prepared to be fully transparent about what data they are collecting and what they are doing with it. If they get this wrong there is a danger that people will feel alienated and start to call for the ability to opt out from data collection activities, setting the whole agenda back by a decade. Taking as read that all government Collective Intelligence initiatives must be done ethically, legally and securely, above and beyond this governments have a duty to only use the data they collect from these activities in such a way that they pass this litmus test: that government would be happy for the public to know what they are doing with the data if the initiative was publicised.

2. Start with a problem, not a technology project

In this document, we have discussed many cutting edge methods and technologies. However, many instances of the use of Collective Intelligence pay too much attention to the development of a new platform, and too little attention to the problem that the platform is supposed to solve. As a result, instances of the use of technology for Collective Intelligence can often end up with low numbers of users and/or little in the way of tangible results. But Collective Intelligence is not about building new technologies, it is fundamentally about a new way of solving problems. To that end, at the outset of any initiative, start with a problem that you have and the solution you want to enable. Based on this, you can choose which method is the most appropriate one to address the problem and whether Collective Intelligence is an appropriate tool.

3. Reuse and build on existing knowledge and expertise

Governments often feel like pioneers in this field. This may be because, unlike areas like the environment and data sharing, there aren't many good global networks of practitioners in the field of Collective Intelligence. But there are many examples where governments around the world have used the tools described in this report to benefit from Collective Intelligence. Before you call in the app developers or commission a data scientist to design a web scraping tool for you, contact the national and city governments and civic minded organisations that have already done what you're planning to do, to see if you can cooperate and build on their experiences and reuse their tools. You should also reach out to potential partners who might be able to supply you with the information you need, from telecoms companies to other government agencies who may already be collecting this information.

If you do decide to build a new piece of technology it is a good idea to support the development of open source technologies such as those created during the D-CENT programme. The idea is to build a shared library of digital tools that governments can add to when they want to make use of Collective Intelligence, rather than start from scratch each time by building proprietary software. For a similar reason, governments that experiment with Collective Intelligence tools should be as open as possible about their activities and findings, through both in-depth reviews at the end of the project but also through regular blogs and events so that other organisations can learn lessons from your experiences and build on them.

4. Choose the right crowd for your problem

When trying to make use of Collective Intelligence, it is useful to think about which segment of the crowd you are trying to engage. If you're looking to come up with a better alcohol management policy for the city, to take one recent city government crowdsourcing initiative as an example, the general population probably isn't the best crowd to consult on this, as they lack the interest and the expertise to deal with the question. In this case, digital tools might be most useful in helping you access a wider pool of experts. Similarly, the crowd sometimes might also mean your own employees or suppliers. Ordinary citizens might feel little motivation to download an app that helps the city map potholes, for example. In this case, it might be much easier to work with resources you already have - your employees - to do this.

However, there may be times when you want to engage a large number of people - to understand the problems faced by people in their daily lives, or to source ideas from groups that do not usually participate in problem solving, to take just two examples. When engaging broadly, here are two things to consider:

- Collective Intelligence initiatives will only be useful if people care about the issue you consult them on. In Jakarta, researchers are able to map flooding via Twitter because this is an issue that costs lives. Flood mapping via Twitter in London wouldn't be as successful as it just isn't as important to Londoners. When you are trying to solve a problem in government and you think you might be able to use Collective Intelligence to address it, make sure that it is an issue people care about before launching a large scale consultation or data gathering exercise.
- Secondly, citizens need to know that their engagement is going to be valued. Tempting as it is to set up a digital suggestion box, if people feel that their contribution is going to be ignored, they will find it hard to engage. This is where things like participatory budgeting help as people know that there is a chance their idea will be put into practice. But even if you don't have a budget, making clear what will happen to suggestions with built in feedback loops will prevent misunderstanding and disappointment.

5. Keep it simple

While governments and public sector organisations are under immense pressure to tackle their most complex and challenging problems first, Collective Intelligence is novel to most organisations. Starting with the basics and getting some quick wins is the best route to sustainably build the support, skills and momentum needed for more ambitious initiatives to succeed further down the line. Therefore, governments wanting to experiment with Collective Intelligence should start with a clearly defined problem and desired outcome, undertake small scale pilots to quickly test what works, then continue to iterate and build on successes.

6. Integrate Collective Intelligence into existing government processes

Many initiatives that enable the gathering of Collective Intelligence stand in isolation - they aren't tied in to government processes. e-petitions are one example of this - they invite views on a single issue in isolation, without taking into account all of the compromises policymakers are forced to make. As a result, it is often difficult for policymakers to act upon the intelligence gathered. To be useful, Collective Intelligence initiatives need to be mindful of the needs of policymakers and other governmental actors and focus on building on and improving what they are already currently doing. In practice, this means, designing Collective Intelligence initiatives in partnerships with those you want to make use of the new intelligence.

7. Don't forget skills

Governing with Collective Intelligence will require policymakers to become familiar with new types of digital tools and new forms of information and data. Without the ability to interpret data, understand how and why it is collected and what the data mean, there is a risk that it will be misinterpreted. Policymakers may be unaware, for example, of the subjective decisions that have gone into selecting and processing the data - or they may simply ignore the initiative.

Governments should set aside resources as part of any Collective Intelligence initiative for capacity building. This will ensure that governments are able to build the in-house skills that will allow initiatives to be sustained and built upon in future.

8. Remember that there is a world beyond the internet

Not everyone is on the internet or has a smartphone. This means that any digital data source has inherent biases. Communities that are underserved by these technologies are usually the elderly, the young, the sick and the poor - often those who are disproportionately the subject of government action and public services. When supporting and piloting new digital tools which seek to harness Collective Intelligence, central and local governments should explore ways to expand their potential to these communities. Working with intermediaries including community groups, charities and NGOs could be one way to do this.

However, it is also important to realise that to make good use of Collective Intelligence, especially in a developing country context, policymakers need to combine online methods with more traditional forms of engagement - face-to-face meetings, household surveys, focus groups etc. Currently, Collective Intelligence methods that make use of digital tools are best seen as a way to augment, not replace, these more traditional methods of data collection.

5. Annex

Next steps for Nesta's programme of work on Collective Intelligence

A new generation of digital platforms are making it easier than ever for governments to make use of the Collective Intelligence of citizens, employees and external experts, involving them in everything from policymaking to budgeting, idea generation to decision-making.

National and city governments around the world are experimenting with a range of digital technologies that seek to do this. These initiatives have many names, from 'open government' and crowdsourcing to citizen engagement and participatory governance, or are described as initiatives involving civic technology or open data. Yet essentially all of these initiatives are an attempt to help policymakers make use of the Collective Intelligence of those who are not usually involved in developing government strategies and overseeing government programmes, whether it is citizens or experts.

Following on from Nesta's research on Governing with Collective Intelligence, in 2017, we plan to carry out a programme of research and practical projects on the use of Collective Intelligence by both local and national governments, as well as multilateral organisations, such as the UN.

This work programme, which is currently under development, will focus on helping these organisations engage citizens, staff and global experts to address both issues within their organisations and problems out in the world. In doing so, the programme will explore a number of issues:

- **Surveying**: How to choose a good problem to apply Collective Intelligence to.
- **Engaging**: Which crowd to engage, how to engage them, what motivates people to take part, which tools should you use.
- **Assessing and Implementing**: what are the skills 21st century public servants need to govern with Collective Intelligence? What processes are required for governments to make use of Collective Intelligence, from sorting and prioritising the knowledge they gather to feedback mechanisms?

Current projects

We are currently working with the United Nations Development Programme (UNDP) to explore the role that Collective Intelligence can play in understanding, mapping and ultimately addressing aspects of multidimensional poverty. Techniques that this work will explore include micro-surveys, self-assessment mechanisms and participatory service design processes. We are continuing to work on Collective Intelligence methods in healthcare through Nesta's Healthlab (including projects on dementia and Parkinson's disease); we're working with partners across Europe - including major cities - on designing new forms of 'data commons' that can significantly enhance their use of information of all kinds; and working with a group of cities in England on the creation of offices of data analytics.

We are open to collaborations with governments, multilateral agencies and companies who would like to explore the use of Collective Intelligence in programme planning and delivery. Please contact tom.saunders@nesta.org.uk if you would like to learn more about this.

Endnotes

1. On the history of public consultation, see: https://www.oecd.org/mena/governance/36785341.pdf; for a range of resources on the use of external expertise in policymaking see: http://www.icpublicpolicy.org/The-Use-of-Experts-and-Expertise
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